ACCOUNTING CONSERVATISM, EARNINGS COMPONENTS AND ACCOUNTING LOSSES

Aljoša Valentinčič, MBA, B.Sc. (Econ.)

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ABSTRACT

This study provides evidence on accounting conservatism based on a large sample of publicly-quoted UK companies over the period 1969-2001. The effects of conservative accounting are studied both indirectly and directly by using earnings measures containing varying levels of accruals and by further decomposing earnings into its operating cash flows and distinct accruals components. The analyses are also separated according to the sign of earnings and earnings components, and account for the effects of asset-recognition rules. Even though conservatism is an accruals phenomenon, this is the first study to provide direct empirical evidence on the role of accruals in accounting conservatism.

The thesis addresses the following issues. First, under conservative accounting, earnings-decreasing changes in performance measures (reflecting economic losses) that contain more accruals mean-revert more and earnings-increasing changes (reflecting economic gains) are persistent. Working capital accruals and special items are particularly strongly mean-reverting when they are earnings-decreasing. Depreciation accruals are persistent.

Second, direct tests by earnings components show that operating cash flows exhibit low timeliness overall and, given that they contain no accruals, no asymmetry in reflecting bad news. Earnings figures with more accruals exhibit more asymmetry in reflecting bad news. Working capital accruals and special items are important in this asymmetry, but depreciation is not. Interestingly, good news results in a small earnings-decreasing charge, consistent with smoothing. Lagged tests on accruals reveal that bad news from as much as three previous periods is reflected in current

earnings through special items, inconsistent with conservatism. Evidence indicates that conservatism is increasing through time. The sensitivity to good news has decreased over time. To capture these changes, higher-moments measures are developed.

Third, the analysis by the sign of "bottom-line" earnings does not reveal any differences in reflecting good/bad news for the profit/loss firms. Separating earnings observations by sign of cash flow also reveals no differences. In contrast, separating observations by the sign of accruals (other than depreciation) reliably shows that the asymmetric timeliness is significantly higher in the negative-accruals groups, as expected. The accruals components determine this asymmetry, rather than the operating cash flow (or, earnings by itself).

Finally, less conservative recognition rules lead to stronger responsiveness of earnings to bad news, as reflected in working capital accruals and special items. Asset-specific measures of conservative recognition rules reinforce these findings. A puzzling result is that operating cash flows reveal a significant asymmetric response to bad news in the group of observations where it is least-likely to be observed (low book to market).

A selection of other results by size, industry, extremity of news, methods, accounting year-ends, market-wide returns, yields, method of estimation, etc., not only corroborates, but generally strengthens the results obtained.

ACCOUNTING CONSERVATISM, ACCOUNTING LOSSES AND EARNINGS COMPONENTS

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LIST OF ABBREVIATIONS

APB	...	Accounting Principles Board (US)
ASB	...	Accounting Standards Board (UK)
ASC	...	Accounting Standards Committee (UK)
CONSLEG	...	Consolidated Legislation (EU)
ED	...	Exposure Draft (UK)
EEC	...	European Economic Community
FASB	...	Financial Accounting Standards Board (US)
FIFO	...	First In – First Out
FRS	...	Financial Reporting Standard (UK)
IAS	...	International Accounting Standard
IASB	...	International Accounting Standards Board
ICAEW	...	Institute of Chartered Accountants of England and Wales
IFRS	...	International Financial Reporting Standard
SFAC	...	Statement of Financial Accounting Concepts (US)
SFAS	...	Statement of Financial Accounting Standard (US)
SIC	...	Standards Interpretation Committee
SSAP	...	Statement of Standard Accounting Practice (UK)

1 INTRODUCTION AND MOTIVATION

In almost forty years of capital market-based empirical accounting research since the seminal Ball and Brown (1968) and Beaver (1968) studies, accounting conservatism has emerged as a dominant explanation of observed differences between share prices and accounting figures, in particular accounting earnings. The essence of conservatism is often referred to by the phrase "anticipate all losses, but recognise only realised profits". While accounting conservatism has been discussed occasionally in early papers (e.g., Scott, 1926; Brock, 1958; Devine, 1963; Sterling, 1967) and historical reviews (e.g., Edwards, pp. 109-110) and proposed as an alternative explanation of observed results (e.g., Hayn, 1995), it was not until the important empirical paper by Basu (1997) that it has become a central issue in the capital market-based research.[1] Basu's (1997) paper has been "amended" by a theoretical model two years later by Pope and Walker (1999) and its analyses extended both in time and in an international context. Both these two influential papers, along with several other papers that followed later, define accounting conservatism in terms of the asymmetric timeliness of earnings. Good economic news, as evidenced in an efficient capital market by increases in share prices (positive returns in period), is recognised in earnings only when the good news is realised. This would generally happen gradually over a number of accounting periods. On the other hand, bad economic news, as evidenced by decreases in share prices (negative periodic returns), should be immediately and fully recognised in

[1] Nobes (1981) cautions that there are two very different types of conservatism:

> "...German or French conservatism is of a wholly different order than Anglo-Saxon prudence." (p. 268)

earnings in the period it becomes known, in some instances already at the time it is only anticipated and thus before it is realised.

In the period 1999-2004, several papers have explored Basu's (1997) intuition and Pope and Walker's (1999) theoretical model to study either the accounting conservatism itself in various settings, or have used this model to infer properties of/variations in accounting rules across time, regulatory regimes and influences of conservatism on other (contractual) questions. For example, variants of the model have been used to infer the changing value-relevance of financial statements over time (e.g., Ryan and Zarowin, 2003; Klein and Marquardt, 2002; Holthausen and Watts, 2001; Givoly and Hayn, 2000). The model has been used to study international variation in accounting rules. Besides Pope and Walker's (1999) empirical UK/US comparison, some of the related studies include Raonic, McLeay and Asimakopoulos (2004) who study the effects of cross-listings on conservatism, and Giner and Rees (2001) who study conservatism in four European countries characterised by different institutional properties. Ball, Kothari and Wu (2000) study four Asian countries and the interaction of accounting standards and managers' and auditors' incentives on conservatism. Ball, Kothari and Robin (2000) study influences resulting from institutional differences between code-law and common law countries. Beekes, Pope and Young (2003) study the influence of board composition – in particular, the number of outside directors – on the asymmetric timeliness of earnings, while Bushman *et al.* (2004) study the influence of earnings timeliness on ownership concentration, directors' incentives and executives' incentives. Other issues studied in this context include quarterly-earnings conservatism and auditors' incentives (Basu, Hwang and Jan, 2001), type of auditor

(Basu, Hwang, Jan, 2000), cost of equity issues (Francis *et al.* 2003, who show that timeliness and conservatism – they distinguish between the two terms – have relatively small influences on the cost of capital), emerging market issues (e.g., Jindrichovska and Kuo, 2002), issues regarding dividend policies and debt costs (e.g., Ahmed *et al.*, 2002) – albeit not directly in the Basu (1997) sense, and others (general review papers include Watts, 2003 and 2003b; Kothari, 2001; Holthausen and Watts, 2001). The list of topics researched is not exhaustive, but at best indicative on the richness of the research area. Moreover, the list of topics related to accounting conservatism is likely to increase in the future. Beginning in 2005, the European Union is introducing the *International Financial Reporting Standards*, an important feature of which is expected to be high(er) timeliness. High timeliness is a characteristic of accounting being conservative in respect to treatment of economic losses but not economic gains and is one of the two important or desired properties or determinants of quality of accounting earnings (European Commission, 2002; Levitt, 1998), the other "desirable" property being the comparability of financial statements.

Surprisingly, although accounting conservatism is by definition an accruals phenomenon, existing empirical studies have not explored the details regarding the particular ways in which accounting conservatism manifests itself in the relation between accounting earnings (and, more generally, other performance measures) and share prices through accruals in these contexts. While the central role of accruals is stressed and commented upon in a large number of research papers cited elsewhere in this chapter, the actual inferences regarding the precise role(s) of accruals in the asymmetric timeliness of earnings to good and bad news have been made only indirectly and using "aggregated" measures. For example, Basu (1997) regresses two cash flows figures (from operations and from operating and financial activities) presumably containing increasingly "less accruals" on good/bad economic news and compares these results with results obtained by regressing earnings before extraordinary items on news. The cash flow and earnings figures contain different amounts of accruals. By comparing the results from one set of figures relative to the other, he is able to comment upon the relative merits of accruals in the observed asymmetric timeliness of accounting earnings and good and bad economic news. A similar approach is taken in other existing studies as well: Pope and Walker (1999) compare ordinary earnings and earnings after extraordinary items and Ball, Kothari and Robin (2000) compare operating cash flows with earnings before extraordinary items. They also explore dividends as an alternative measure of company performance.

Most visible applications of accounting conservatism that result in large, transitory one-time items include, for example, large losses on disposals and restructuring costs and it is thus not surprising that the primary focus of the studies quoted above has been on accruals items that fall under the general descriptive term "special items" (e.g., Kinney and Trezevant, 1997). However, literature related to, but not directly concerned with, accounting conservatism has shown that the links between other types of more "ordinary" accruals, examples of which include working capital accruals and the depreciation charge, and future cash flows are (potentially) important. One question that emerges is whether these "ordinary" types of accruals have an important role in the observed asymmetric timeliness of accounting earnings. Moreover, the precise nature of "special items" has often not been clarified in (non-US) empirical literature.

If the application of accounting conservatism does cause large one-time transitory items to appear in accounting earnings, it is not unreasonable to expect that at least in some cases these items would cause (one-time) bottom-line accounting losses, a decrease in accounting earnings or accounting earnings that are lower than they would otherwise be. Empirical literature has shown that both losses and earnings decreases mean-revert fast and are thus by and large transitory (e.g., Das and Lev, 1994; Freeman and Tse, 1992), which is consistent with predictions under accounting conservatism. Moreover, there is a notable body of empirical literature that shows from several different aspects that the relation between share prices and accounting earnings (and book values of equity) relate in ways that are not characteristic of "normal" firms (e.g., Donnelly, 2002; Collins, Pincus and Xie, 1999; Lipe, Bryant and Widener, 1998; Berger, Ofek and Swary, 1997; Beaver, McAnally and Stinson, 1997; Ali and Pope, 1995; Jan and Ou, 1995; Hayn, 1995; Martikainen, 1997). In relating these findings to the accounting conservatism literature, an important question emerges. Are these "different" relations a result of differences in applications of the conservatism principle? Or, for example, can the application of conservative accounting practises that results in an accounting loss be treated as a mere manifestation of the appearance of (extreme) bad news that must then be recognised in financial statement immediately due to accounting conservatism?

Finally, Pope and Walker (2003), building on Feltham and Ohlson (1995, 1996) and other (e.g., Beaver and Ryan, 1996) literature, place an asset-recognition restriction on these relations. Firms that write-off as an expense the entire amount invested in an asset at the time the investment expenditure occurs, should not exhibit asymmetric timeliness in accounting earnings in reflecting bad news in later accounting periods, given that the assets to which the investment expenditures relate, would not have been recorded as an asset in the balance sheet. However, analogously to the literature on conservative treatment of economic gains and economic losses, no distinction is made about the precise sources of these restrictions. For example, firms that exhibit relatively large amounts of net working capital are more likely to recognise the effects of conservative treatment of economic gains and losses through changes in net working capital accounts than through other accounting items.

This thesis empirically explores these research issues. It uses a large and comprehensive UK sample of publicly-quoted companies in a contextually very long time-series spanning firms with financial year-ends ending in years 1969-2001. The sample includes failed companies, but excludes, as is conventional, financial and related firms – see, e.g., Danbolt and Rees (2001). The thesis starts with a general observation resulting from different treatment of economic gains (increases in market value) and economic losses (decreases in market value) under conservative accounting – namely, that economic gains are recognised in financial statements gradually, as they are realised and the realisation can be appropriately verified, while economic losses are recognised in financial statements immediately and fully in the period they are realised (or, anticipated, specifically in the case of decreases in market value). In other words, gains tend to persist in different performance measures affected, while losses tend to be transitory. While either empirical results or theoretical predictions for some accounting figures – in a great majority of cases this would be the earnings figure – have already been shown in other related studies (e.g., Barth, Cram and Nelson, 2001; Fama and French, 2000; Dechow, Kothari and Watts, 1998; Basu, 1997; Sloan, 1996; Dechow, 1994; Albrecht, Lookabill and McKeown, 1977; Ball and Watts, 1972; Beaver, 1970), this study extends the literature in the UK context and construct and study the persistence behaviour of three earnings figures, designed to be comparable, to the maximum extent possible, across the entire time-period studied. Moreover, the existing literature is extended, in particular the Basu (1997) results by examining relative persistence properties of some of the main components of earnings – operating cash flows and accruals, of which the main components are working capital accruals (and its components), the depreciation and amortisation charge and "special items" (appendices contain additional accounting figures) under conservative accounting. The distinction between earnings-increasing and earnings-decreasing changes in these figures is made, as well as an allowance for any possible differences between profit firms and accounting loss firms as well as firms affected by bad and good news. Apart from providing some additional insights related to consequences of conservative treatment of economic gains/losses on time-series properties of these "performance" measures, the analysis also helps in forming expectations about direct relations between various accounting performance measures and share prices as well as indications regarding any differential effects between accounting-profit and accounting-loss firms.

Next, using Pope and Walker (1999) models, direct tests of accounting conservatism are performed separately by various accounting earnings measures and the aforementioned main earnings components. The role of accruals in the asymmetric relation can be inferred in two ways: indirectly, via a comparison of accounting earnings and operating cash flow regressions, and directly, by performing direct conservatism tests on the main accruals components. The study allows for the different roles working capital accruals, its components, the depreciation and amortisation charge and special items might have in the asymmetric timeliness of earnings reflecting the application of accounting conservatism to treatment of economic gains and losses. All accounting measures containing accruals components should exhibit asymmetric timeliness in reflecting bad economic news (economic losses) albeit not in a uniform way. Economic gains, on the other hand, should be reflected in accounting figures only gradually, i.e., not the entire capitalised amount of an economic gain would usually be recognised within the same accounting period. To study these relations, both the contemporaneous (i.e., current-period accounting figure regressed on current-period returns inferring the general relation) and the lagged (i.e., current-period accounting figure regressed on current and previous-period(s) returns reflecting the speed of recognition of news) are employed. Given that several US-based research papers indicate that the nature of the relation between financial statements relative to market values might have changed over the last few decades (e.g., Ryan and Zarowin, 2003; Givoly and Hayn, 2000; Francis and Schipper, 1999; Collins, Maydew and Weiss, 1997), \ a time-series analysis of changes in accounting conservatism is provided as well. Regarding the UK context and regarding the methods used in this research to make inferences, a time-series analysis requires the use of some complementary measures of the time-series changes in accounting conservatism that differ from those employed in the existing literature.

Following the indications that accounting-conservatism and accounting-losses phenomena are related, descriptive properties of accounting loss and profit observations are provided separately in addition to the accounting loss and profit distinction in terms of time-series properties of earnings and its main components. The descriptive statistics and correlations between pairs of accounting variables are very different for the two groups of firms. However, in terms of accounting regulation and in particular the application of accounting conservatism, differences between the two groups of observations are not expected. Accounting conservatism should be applied equally in all firms regardless of the sign (of the contemporaneous) "bottom-line" earnings. In an attempt to capture any potential differences in asymmetric timeliness of earnings, an absolute-value model is constructed and an attempt to empirically estimate it provided. Further, an interaction with persistence properties is attempted via Giner and Rees's (2001) augmented model where lagged accounting-performance measures are used as models of the effects of previous periods' conservatism both generally via earnings and specifically via earnings component-specific measures as an extension of their models.

Finally, the ex-ante restriction is placed on these relations using Pope and Walker's (2003) model as well as expanding on these relations to accommodate asset-specific controls of sources of ex-ante conservatism.

A particular set of challenges originates from the empirical context in which the study is made. First, from a time-series perspective, the data on companies operating in the United Kingdom is much more scarce than the data on US companies, to which results from this study would often be compared to. Issues regarding the construction of the sample are challenging and are described in detail in the appropriate section. On the other hand, the time-series required to apply the Fama and MacBeth (1973) procedure in comparable research must be relatively long. In this study a sample that includes 33 yearly cross-sections is constructed, a number deemed to be large for statistical purposes. Thus, such long time-series of accounting figures immediately raises issues regarding the comparability of these figures across time. Important issues emerge already at the earnings level, the accounting figure most thoroughly researched. For example, a clear switch from extraordinary to exceptional items is apparent after the introduction of FRS 3 – *Reporting Financial Performance* effective for financial year ends on or after 22nd June 1993. Issues related to other accounting figures pose similar challenges. Moreover, as new (changing) regulatory requirements have produced conceptually different numbers, questions regarding the "representativeness" of these constructed figures emerge. In terms of the inference methods used, a particularly challenging factor is a large proportion (approximately two thirds) of UK companies with non-December 31st fiscal year-end balance sheet dates. This implies some correlation of results across adjacent years is to be expected and the yields from Fama-MacBeth (1973) method decrease.

The thesis is formally organised as follows. Chapter 2 presents a selection of important elements of capital market-based accounting research, including the seminal studies of Ball and Brown (1968) and Beaver (1968), that have served as important precursors to accounting-conservatism explanations of low contemporaneous relation between share prices and accounting figures (most notably, earnings). It also presents two crucial econometric problems that have affected early studies (i.e., studies preceding Basu, 1997, and Pope and Walker, 1999), but that are, to the extent discussed in the related literature, solved by the method of empirical estimation used in this thesis. The chapter concludes with a summary of various regulatory, legislative and academic definitions of accounting conservatism, including the distinctions between two different forms of accounting conservatism, and discusses the relative importance of these definitions that form the basis for empirical models and appropriate constraints.

Chapter 3 presents theoretical models used later in the empirical part of the thesis. In particular, it formalises the persistence property of accounting figures and determines the form of study, provides a slightly modified derivation and a summary of Pope and Walker's (1999) contemporaneous and lagged models. It also presents certain augmentations/additional explanations of these models. The chapter concludes with a formulation of the main hypotheses (other, less crucial or additional hypotheses are relegated to appropriate sections in the empirical part).

Chapter 4 represents the main part of this thesis. First, it presents in detail the data collection, sample-selection procedures and descriptive properties of the sample. Included is a summary of the econometric procedures followed in the thesis, namely the Fama and MacBeth (1973) procedure, and the way the results are presented. It is then followed by persistence tests, direct contemporaneous tests, direct lagged tests, time-series analysis of results, expansions of the models and results affected by ex-ante conservative restrictions. Finally, a separate section shows in detail both the properties and direct tests on loss observations and discusses a serious limitation of such an analysis.

Chapter 5 deals with the main sensitivity-analyses issues. The influence of size, industry groups, the issue of non-December fiscal-year ends, proxies for bad news, methods of estimation, outliers-removal procedures and some issues regarding the use of published versus constructed figures are presented. All are given particular attention in terms of the UK context in which the methods are applied. Some additional issues and analyses are relegated to the Appendices.

2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents an overview of existing literature on capital market-based accounting research that preceded the development of formal models of accounting conservatism. It thus represents the literature that preceded Basu (1997), Pope and Walker (1999), Ball, Kothari and Robin (2000), Giner and Rees (2001), Pope and Walker (2003) and others. The chapter is divided into three broad sections. The first section presents the foundations of capital market-based accounting research: the early findings that accounting numbers contain value-relevant information and therefore set the motivation to study the link between accounting and market values, the economic nature of this information and an overview of explanations as to why do accounting values differ from market values. From this presentation, transitory components caused by accounting conservatism emerge as one of the possible explanations of these differences.

To account for the econometric consequences of transitory earnings, the errors-in-variables problem is described in detail. This presentation is important in that it represents the technical reason why the models of accounting conservatism are estimated in the so-called "reverse" form. Another concept that influences the particular ways of empirically estimating models of conservatism is the concept of s scale or size. The particular forms of the models used in the empirical part of the thesis are, at least in part, a consequence of dealing with these two econometric problems.

Finally, the last section presents a comprehensive review of existing definitions of accounting conservatism. These definitions fall into two broad groups: regulatory texts (standards, frameworks, legal sources, etc.) and academic definitions. These definitions are necessary to distinguish between two types of conservatism: the news-related conservatism, which is studied in this thesis, and pervasive conservatism, which places a limit on the main results on news-related conservatism. As an additional motivation to research these definitions thoroughly, it must be noted that from various texts it is not always clear to which of the two forms the use of the term "conservatism" relates to.

2.2 CAPITAL-MARKET BASED EMPIRICAL ACCOUNTING RESEARCH AND LINKS WITH CONSERVATISM

2.2.1 Information content of accounting numbers

The research presented in this thesis is part of the capital market-based empirical accounting research. The capital market-based empirical accounting research examines the relations between financial statements and share prices (and other market-based metrics) (Kothari 2001; Lev and Ohlson, 1982). The discipline has evolved from two seminal studies that examined these relations (Ball and Brown, 1968; Beaver, 1968). They demonstrated for the first time that accounting numbers have information content, i.e., that they are associated with market values of owners' equity.

The following discussion presents a comprehensive general framework that can be used to illustrate the link between financial statements – in particular accounting earnings – and share prices. The link can be described in the following manner (e.g., Pope and Inyangete, 1992, in summarising Beaver, Lambert and Morse, 1980). Three assumptions are necessary to establish the link between accounting earnings and market values. The first assumption is that price equals the present value of future cash flows. For example, the dividend discount model provides one such model that links future cash flows (dividends) with the current share price. An equivalent "accounting"-based model is the residual income model (Preinreich, 1937; Peasnell, 1982) reintroduced and extended in the accounting literature by Ohlson (1995) (Lo and Lys, 2000). The second assumption is that there is a link between future earnings and future dividends. For example, this assumption is met if some fixed proportion of earnings is paid out as dividends every year. The third assumption is that current accounting earnings are linked with future accounting earnings. Thus, unexpected revisions of current earnings should influence investors' assessment of future earnings, which are then directly linked with future cash flows (dividends) and, by discounting these future dividends with some known (fixed, non-stochastic) discount rate, with current share prices.[2] It is assumed here that the accounting figures in general are represented by accounting earnings. However, this assumption is not necessary and other accounting measures may be

[2] The role of risk and stochastic interest rates is presented in Feltham and Ohlson (1999).

(and are) used instead of earnings and some studies have attempted to establish precisely this link (e.g., Ou, 1990).[3]

A generic empirical formulation of this link between accounting earnings and share prices may be the following (e.g., Joos, 2000; Lipe, Bryant and Widener, 1998; Collins and Kothari, 1989; Brown *et al.*, 1987 and several other papers):

$$CAR_{it} = \alpha + \beta UX_{it} + e_{it} \quad (2\text{-}1)$$

where CAR_{it} is a measure of the risk-adjusted return for security i cumulated over the period $(t, t-1)$ (i.e., unexpected or abnormal or above-average return), UX_{it} is a measure of unexpected earnings for firm i over the period $(t, t-1)$ and e_{it} is a disturbance term assumed to be distributed normally with parameters $e_{it} \sim N(0, \sigma^2_e)$ and $cov(e_{it}, e_{j,t+k}) = 0$ for all k and $i \neq j$. The calculation of both CAR_{it} and UX_{it} requires a method of calculating the expected components of returns and earnings respectively.[4] Various methods of specifying unexpected earnings (UX) are presented in a number of papers. For example, Beaver and Dukes (1972) derive expected earnings by five different models: by forming a model analogous to the market model in market returns, by assuming earnings follow a random walk, by assuming current earnings are a simple average of a limited number of past earnings, and two more complex models involving moving averages of pure mean-reverting processes.[5] A further paper is Beaver, Clarke and Wright (1979), who use, *inter alia*, a relatively complex model of market-adjusted earnings, a concept related later to

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[3] Historically, however, earnings were the first accounting figure explored in this context.
[4] The econometric consequences of misspecifying either of the two metrics/expectations as used in equation (2-1) are, however, significantly different, as is shown later in section 2.3.1.
[5] The framework that includes some of these processes is formally presented later in section 3.2.

adjustments in Basu (1997). Unexpected returns (*CAR*) would usually be estimated by employing some form of the market model (e.g., Parkash, 1995; Pope and Inyangete, 1992; Mendenhall and Nichols, 1988) or by directly subtracting the return on a well-diversified index from the firm-specific return in the same time-period, as for example in Lipe, Bryant and Widener (1998).

The expected value of the estimated regression constant in model (2-1) is zero, $E[\hat{\alpha}] = 0$. The constant would, however, usually be included in empirical estimations to account for any systematic influences not accounted for by the unexpected earnings variable. The estimated regression parameter $\hat{\beta}$ is the estimated earnings response coefficient. The earnings response coefficient represents the magnitude of share price reaction due to a one unit of unexpected earnings in current earnings. If the earnings number contains an earnings innovation, a surprise for the investors (i.e., when unexpected earnings are not zero [$UX_{it} \neq 0$]), then the expected value of the coefficient is $E[\hat{\beta}]>0$. The absence of any annotation of the estimated regression coefficient $\hat{\beta}$ in equation (2-1) suggests that the earnings response coefficient is assumed to be a temporal and cross-sectional constant. The reaction to unexpected earnings is thus assumed to be constant through time and equal across firms at any given point in time.

The generic relationship in equation (2-1) serves to investigate two related, but conceptually different questions about the relationship between financial statements and market values (Kothari, 2001). The first question is whether an earnings announcement *per se* has any information content – i.e., if the announcement *per se* causes investors to revise their expectations about future benefits. If they do, the revision will be observed as a change in some market metric (price level, price variability and/or trading volume (Lev and Ohlson, 1982) in the short period of time surrounding the announcement – typically, but not necessarily, a few days (Biddle and Seow, 1991). These studies are performed with an event study (e.g., Fama *et al.*, 1969). The internal validity of this type of studies depends on the existence of any confounding events surrounding the earnings announcement (e.g., dividend changes) and the ability of the researcher to disentangle the effects of these other events from the earnings announcement itself. The second question is whether accounting earnings are consistent with the information about underlying value-generating events as reflected in share prices. These issues are studied with an association study. Unexpected returns are accumulated over long periods of time – typically a year or a quarter that correspond to the fiscal period over which unexpected earnings are accumulated. Causality is not inferred in this type of studies and they do not assume that accounting earnings are the only source of information to market participants. The only relevant question is the existence of association (correlation).[6] The early information content studies cited above typically belong in the first group, i.e., causality is assumed from unexpected earnings to changes in share prices.

Ball and Brown (1968) and Beaver (1968), provide early evidence that the earnings numbers provide a source of value-relevant information to financial markets. The key finding by Ball and Brown (1968) is that the earnings number is useful to investors in that it conveys new, economically significant information about future cash flows. If actual earnings are higher (lower) than expected earnings

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[6] In this respect, see Muller and Riedl (2001) critique.

– the expected earnings being measured with three different models in their study – the share price will increase (decrease), on average. Moreover, accounting earnings do not represent a very timely source of information. Ball and Brown estimate that most (85%-90%) of the information content of earnings is already captured by other, more timely sources, including interim reports, by the month of publication of the earnings figure.[7]

Beaver's (1968) study takes an alternative approach and avoids the exact specification of expected earnings by correlating trading volume rather than abnormal returns with earnings announcements. The basic idea is that at the time of the announcement of earnings, investors will re-assess their estimates of future returns or prices and act on the basis of this assessment. While it is not possible to predict the direction and/or magnitude of investors' reaction without an expectations' model, the variability of price changes will be higher during these periods of "adjustments" relative to periods when no such announcements occur (Kwon and Wild, 1994). Beaver finds significantly higher trading volume in the week of earnings announcement compared to ±8 weeks prior to/after the announcement, re-confirming Ball and Brown's (1968) finding that earnings announcements convey economically significant information about future cash flows. A necessary condition for Beaver's (1968) approach is that the changes in the present value of the changes in expected future cash flows must be sufficiently large to compensate for transaction costs (Lev, 1989).

[7] In an UK context, Opong (1995) shows that that interim financial reports contain value-relevant information as evidenced by increased variability of share prices on the release day.

Subsequent studies have re-confirmed these findings in a number of different settings and time periods. For example, May (1971) finds that price changes are larger in the week of quarterly earnings announcements relative to average price changes during the year, but that quarterly earnings are treated equivalently to annual earnings. Beaver and Dukes (1972) examine the influences of various specifications of expected earnings and different measures of performance, including the operating cash flow. Jordan (1973) further reports that the market values the first and fourth quarter earnings differently from third quarter and final earnings. Other extensions include Smith-Bamber (1986) who finds that the greater the unexpected quarterly earnings, the greater the magnitude and the longer the duration of investors' adjustments to information in quarterly earnings announcements. Moreover, she hypothesizes and finds that the smaller the firm, the more pronounced are these two effects, since for smaller firms, the earnings announcements are expected to constitute a more important source of information to the capital markets than for larger firms. Kross and Schroeder (1989) extend these findings further to differentiate between "prominent" and "obscure" firms as measured by column-inches in the *Wall Street Journal.* They hypothesise that earnings disclosure is a more important source of information for smaller than for larger firms, given that the former receive less coverage in the financial press and less information is thus available for them. The expected reaction to earnings announcement is thus expected to be larger for smaller firms. There are many other empirical studies in this area. The example of Kross and Schroeder (1989) might perhaps be taken as indicative of the thoroughness with which this area has been researched.

While this body of literature studied the response of returns to earnings in some detail and a number of those studies cited above presented alternative sets of results for operating cash flow figures as well, none of them considered explicitly the role of accruals in these relations. There were three important studies published in the mid-eighties that specifically examined the role of accruals. Using a long window (12 months) event study, Rayburn (1986) finds that both the cash flow and total and current accruals are associated with information impounded in market values. The association of particular components of accruals is less strong and sensitive to the specification of expected values of these components. While working capital accruals are associated with returns in all specifications, there is some doubt regarding the depreciation charge and deferred taxes. Wilson (1987) finds that cash from operations and the total accruals components of earnings, when taken together, have incremental information content over earnings. Additionally, Wilson (1986) finds that accruals have incremental information content over funds from operations. Taken together, these studies have demonstrated that (some of) the accrual components also have information content.

Firth (1976) conducted the first study employing these techniques using UK data. In addition to re-confirming the Ball and Brown (1968) results in the UK context, he also finds that investors evaluate future prospects not only of the announcing firm itself, but also of "similar-type" companies (i.e., competitors). Firth (1981) later extends the study to different events and finds that preliminary announcements, earnings announcements and interim reports convey information to markets, while annual general meetings do not. A similar study is by Brookfield and Morris (1992) using daily data. In contrast to annual and interim earnings announcements, they find that announcements of items like new contracts, management changes and even publications of earnings forecasts are largely pre-empted by the time they are published. Pope and Inyangete (1992) find that the variability of stock returns increases sharply in the week of the annual earnings announcement compared to pre-announcement periods (and post-announcement periods, although slightly less pronounced). This increase is more pronounced for small firms and less pronounced for larger firms, consistent with Smith-Bamber (1986). There is also some indication of importance of the frequencies of news and comments appearing in the databases, consistent with Kross and Schroeder (1989).

Taken collectively, these studies have shown that accounting numbers in general contain information that is useful to investors to assess the size and/or the timing and/or the riskiness of future cash flows. In particular, if accounting earnings differ from expected values, the share prices adjust accordingly in the same direction. Both of the main components of earnings, (operating) cash flows and accruals, have been found, or at least indicated, to contain value-relevant information.

2.2.2 *Economic determinants of the link between financial statements and market values*

Empirical evidence presented in the previous section is consistent with accounting earnings containing information that is useful to capital markets in that this information is able to influence investors' expectations (assessments) of future cash flows. Also, these studies have shown at least some accounting numbers other than earnings (i.e., operating cash flows and certain types of accruals) convey value-relevant information to capital markets. However, while demonstrating the information content of various accounting numbers, these studies did not explore the nature of accounting numbers and their relation to the market value of the firm (Mande, 1994; Kormendi and Lipe, 1987). Research that studies the economic determinants of earnings response coefficients followed.

An early comprehensive study of economic determinants of earnings response coefficients is Collins and Kothari (1989). They hypothesize and find empirical support for four economic determinants of earnings response coefficients: persistence of earnings, risk, growth and the risk-free rate of return. In the general equation (2-1) in the preceding section, the estimated regression coefficient $\hat{\beta}$ represents the estimated earnings response coefficient. Formally, the earnings response coefficient can be defined as

> "... the present value of the perpetuity of the earnings innovation calculated by discounting the perpetuity at the risk-adjusted rate of return on equity." (Kothari, 2001, p.124)

The expected theoretical value of the earnings response coefficient is $\beta = 1 + (1/E[r_{it}])$ where $E\ [r_{it}]$ is the expected rate of return on equity. The earnings response coefficient thus equals the one unit change in current period's earnings plus the present value of all expected future changes in dividends resulting from this innovation (Kothari, 2001; Kothari and Sloan, 1992; Collins and Kothari, 1989).

The first economic determinant of earnings response coefficients is earnings persistence. Highly persistent earnings mean that a change in current period's earnings will repeat itself in future reporting periods thereby affecting future earnings (the third assumption from the previous section). Under the second assumption from above – that there is a known link between future earnings and future dividends – a change in earnings today will affect expectations about future dividends. If today's change is likely to repeat itself, this will affect today's expectations about future dividends more and the earnings response coefficient will be large (Collins and Kothari, 1989; Easton and Zmijewski, 1989). Using an inverse regression approach, Collins and Kothari (1989) find empirical support for this hypothesis. O'Hanlon, Poon and Yaansah (1992) find empirical support for this hypothesis in an UK context. Donnelly and Walker (1995), also using a UK sample, also report that the higher the earnings persistence, the higher the estimated earnings response coefficient after controlling for firm size and alternative time-series estimators of earnings response coefficients. Donnelly (2002) is a recent study that re-confirms these findings by estimating earnings response coefficients separately for profit and loss firms.[8] Harikumar and Harter (1995), also using the reverse-regression technique, show that firms with higher Tobin's q ratios exhibit higher persistence of earnings. Persistence itself is a function of economic factors. For example, Baginski *et al.* (1999) find that persistence is positively related to barriers to entry, negatively to capital intensity and is higher for durable goods versus non-durable goods.

Second, the higher the systematic risk of a firm, the lower the earnings response coefficient. As discussed above, to estimate the present value of expected future benefits, shareholders must discount these future benefits to present time in order to evaluate them. One way to calculate the expected rate of return on an

[8] Section 4.8.1 contains a more complete presentation of the literature that distinguishes these properties between profit and loss observations.

investment is to use the CAPM model (summarised in, for example, Bodie, Kane and Marcus, 1999, pp. 250-280; and different variants in Elton and Gruber, 1995, pp. 294-340):

$$E[r_{it}] = r_{ft} + (E[r_{mt}] - r_{ft})\beta_{it} \tag{2-2}$$

where $E[r_{it}]$ is the expected return on share i over the period (t, t–1), r_{ft} is the risk-free rate of return allowed to vary through time, but not, by definition, cross-sectionally, r_{mt} is the return on market in period t and β_{it} is the firm-specific measure of that firm's equity exposure to market risk, assumed to be constant or highly autocorrelated for any particular firm – i.e., the process generating β_{it} is known. Other things equal, the higher the systematic risk, the higher the discount rate and the lower the present value of expected future benefits accruing to shareholders. More recently, the Fama and French (1993, 1995) three-factor model is used (e.g., Fama and French, 1997). In the UK, the three-factor model is used recently by Liu, Strong and Xu (2003) in their study of the post-earnings announcement drift.

Third, Collins and Kothari (1989) hypothesize that the higher the present value of growth opportunities, the higher the earnings response coefficient. Higher growth opportunities imply higher future earnings, higher future dividends and a higher value of the firm. All other things equal, a revision in earnings for a firm with more growth options will affect market values more compared to a firm with less growth options. Martikainen (1997) finds that the earnings response coefficient of firms in the portfolio of firms with the lowest growth opportunities measured by the industry-relative market-to-book ratio is 0.473 (with a statistically insignificant

White (1980)-adjusted t-statistic of 1.790), while for the portfolio of firms with the highest growth opportunities the earnings response coefficient is 6.605 and highly statistically significant. The analysis controls for differences in growth opportunities that might result from any systematic differences between profit and loss firms.

Finally, given a model of expected returns like, for example, the CAPM model in equation (2-2), the expected rate of return depends on the risk-free rate of return, the expected return on the market and the firm's exposure to market risk, measured by the β-coefficient. The risk-free rate of return cannot, by definition, vary cross-sectionally, but it does vary through time. Therefore, through time, the higher the general level of interest rates and thus the higher the risk-free rate of return, the lower the earnings response coefficient. Similarly, the expected rate of return on the market, r_m, cannot explain cross-sectional variation in earnings response coefficients, given that it only varies through time but again not cross-sectionally. This variation through time of r_m (or perhaps more precisely the market risk premium $r_m - r_f$) might in itself constitute another determinant of the average earnings response coefficient in an economy.

Taken together, the four determinants of the earnings response coefficients studied by Collins and Kothari (1989) indicate that the generic form of the relationship between earnings and returns presented in equation (2-1) is very general. A more complete analysis of the returns-earnings relationship should thus take into account the fact that the earnings response coefficient (the estimated parameter $\hat{\beta}$ in equation (2-1)), is not a cross-sectional and/or an inter-temporal constant. This conclusion also implies that the method of estimation of models derived from equation (2-1) becomes important. Teets and Wasley (1996) show that short-window earnings response coefficients are significantly higher if estimated separately for each firm as a time-series average rather than cross-sectionally or pooled. More recently, Lipe, Bryant and Widener (1998) re-confirm that allowing cross-sectional variation in earnings response coefficients provides an important improvement of the estimation of the return-earnings relation. For example, in one of their tests they find that the median earnings response coefficient of 30 random sub-samples is only 1.253 if cross-sectional estimation is used, but the median more than doubles to 2.735 if firm-specific estimation is used (*ibid.*, p. 208, Table 2).

There are several other economic determinants of earnings response coefficients. These either result from decompositions of the above factors into more elementary factors or represent new, distinct determinants derived from economic analysis. For example, the influence of systematic risk can be decomposed into operating risk and additional financial risk resulting from leverage (Hamada, 1972). Mandelker and Rhee (1984) develop further this concept and introduce directly the degree of operating leverage and the degree of financial leverage as determinants of systematic risk in the returns-earnings relationship. Martikainen (1997) shows that the earnings response coefficient decreases monotonically from low-debt to high-debt portfolios after controlling for the sign of earnings. Burgstahler, Jiambalvo and Noreen (1989) find that the *a priori* probability of bankruptcy is negatively related to the earnings response coefficients. Teets (1992) finds that the earnings response coefficient is smaller for regulated electric utilities than for non-regulated industries.

Dividend payout policy also affects the earnings response coefficient. The theoretical upper limit is reduced by the proportion of earnings not reinvested and therefore unable to earn future dividends, so that the theoretical upper limit becomes $\beta = 1 - d + (1 / E[r_{it}])$ where d is the dividend payout ratio (Kothari and Sloan, 1992). Biddle and Seow (1991) find that earnings response coefficients vary across industries and in particular that they are lower in industries characterised by a higher degree of operating and financial leverage and are higher in industries characterised by higher growth, higher barriers to entry and higher growth opportunities.[9]

Billings (1999) re-confirms the previously observed negative relation between earnings response coefficients and debt to equity ratios, but remains inconclusive about whether the default risk proxied for by bond ratings has an incremental impact over the impact of systematic risk or not. He also indicates that expected growth should be included in empirical studies of this relationship. The length of the time-series of previous earnings also affects the earnings response coefficients. Lang (1991) finds that the more quarterly earnings announcements have been issued since the initial public offering, the smaller the earnings response coefficient. Thus the length of the "public-quotation period" may also be viewed as a determinant of the earnings response coefficient, similarly to the importance of firm age in survival studies (e.g., Altman, 1993; also Anthony and Ramesh, 1992)

The list of determinants of earnings response coefficients is not exhaustive. It is, however, indicative of the richness of studies developed in this area of capital market based accounting research. They constitute the body of knowledge that has

[9] They measure growth opportunities essentially with the book-to-market ratio. This impacts some of the results presented in this thesis.

led to later, more economics-based models of the link between financial statements and market values. These models include models that capture the effects of two different forms of accounting conservatism.

2.2.3 *Variability in earnings versus variability in returns*

Early empirical studies of earnings response coefficients have found that accounting earnings (levels or changes) explain only a small proportion of the total variability in returns. Moreover, the observed relation between returns and earnings reported in these studies is often not in line with theoretical expectations. Several studies have shown that the R^2s in empirical applications of the model in (2-1) above are low and the values of the estimated earnings response coefficients ($\hat{\beta}$) are very low (close to zero) compared to values predicted theoretically, or even negative (e.g., Collins, Pincus and Xie, 1999; Jan and Ou, 1995; Schroeder, 1995). Moreover, some studies find that the value-relevance of accounting numbers is declining over time (e.g., Francis and Schipper, 1999; Ryan and Zarowin, 2003). As a retrospective illustration, Ryan and Zarowin (2003) show in their basic models, where returns are regressed on deflated earnings, that from the period 1966-1970 to 1996-2000, the earnings response coefficient has decreased from 2.816 to 0.563 and the R^2 from 0.13 to 0.05. Somewhat contrary, Collins, Maydew and Weiss (1997) find that the combined value-relevance of both earnings and book values has not changed in the period 1953-1993. They do, however, find that the value-relevance of earnings alone has decreased almost monotonically in this period. Several hypotheses that attempt to explain why this occurs have been proposed in the literature. These hypotheses are not mutually exclusive and in certain cases partially overlap with one another. The following presentation of these hypotheses is based on Kothari's (2001) review article and the framework developed there, although it is modified to accommodate in more detail the parts relevant to this study and to omit parts that are less immediately relevant to models used later in this thesis.

Generally, the findings that empirical estimates of earnings response coefficients and/or R^2s are low compared to expected values can result from either side of equation (2-1). Starting on the left-hand side of equation (2-1), errors in measurement of the dependent variable and/or misspecification of the expected part of *CAR* would result in low R^2s but would not affect the earnings response coefficient. Notwithstanding the problems in estimating the expected part of total returns on a security, the reliance on the concept of market efficiency is emphasiozed (e.g., Fama, 1970). The efficient markets hypothesis is a maintained hypothesis of this type of accounting research and a number of metrics used to make inferences rely on it. However, this assumption could, in principle, be violated – capital markets might in reality not be efficient. Thus, share prices would not reflect the underlying economic reality of the firm fully and in a timely manner. There are a number of studies that conclude that in some aspects capital markets are not efficient. For example, several studies suggest that the stock market does not incorporate immediately/fully the information contained in accounting earnings and that it recognises the full impact of earnings only gradually over time. This notion is known under the term post-earnings announcement drift, documented as early as in Ball and Brown's (1968) study. A recent example of a study that concludes in favour of violations of market efficiency is Collins and Hribar (2000). However, other recent studies ascribe the existence of this "anomaly" to econometric problems related to methods used in previous research (e.g., Jacob, Lys and Sabino, 2000) or find that observed violations are too small to be profitable after transaction costs (e.g., Choi, 2000). However, in an UK context, Liu, Strong and Xu (2003) make a particularly strong conclusion regarding the existence of one such violation of market efficiency – the post-earnings announcement drift:

> "The fact that the evidence of post-earnings announcement drift reported in this paper for the UK ... reinforces the view that the PAD phenomenon constitutes *a clear rejection of the efficient markets hypothesis*." (p. 23, emphasis added)

Given the voluminous body of research that concludes in favour of market efficiency (reviewed at two time periods relatively distant from one another in Fama, 1991 and 1970), the assumption of (semi-strong) market efficiency is maintained throughout the empirical part of this thesis. Given the models employed, the consequence of severe violations of this assumption would be that it would no longer be possible to use the change in market value as a valid indicator of the impact of economic news. Given the form of these models, violations of market efficiency would cause the errors-in-variables problem in the independent variable (discussed below in detail in section 2.3.1) and the resulting attenuation bias of the main accounting conservatism measures.[10]

On the other hand, assuming that capital markets are reasonably efficient, the second group of reasons for the low observed adjusted R^2s and empirical estimates of earnings response coefficients must lie in the issues surrounding the measurement of

[10] This observation follows, conceptually, from models that are "reverse" compared to models such as in equation (2-1). All models presented in sections 3.3 and 3.4 are of the "reverse" type compared to (2-1).

unexpected earnings (*UX*). If this is the case, the independent variable that determines the earnings response coefficient is measured with error (e.g., Machuga, 2000). Econometrically, this causes the attenuation bias in the value of the coefficient on earnings (explained in detail in section 2.3.1). Possible causes for the errors in variables problem in the *UX* variable are the following: i) prices lead earnings, ii) earnings containing a value-irrelevant component, iii) (value-)deficiency of accounting measures and iv) earnings persistence/existence of transitory components of earnings. This last explanation includes both the effects of accounting conservatism and the effects described in the literature on losses, and it is suggested that the latter might be a consequence of the former.

The first cause of the errors in variables problem in the independent (*UX*) variable is the prices lead earnings hypothesis. If earnings do not reflect underlying economic events in a timely manner, as opposed to (changes in) market values, then market prices will reflect a larger information set than earnings. This notion is termed as prices lead earnings (Beaver, Lambert and Morse, 1980). The "lack" of earnings timeliness originates from at least two sources (Collins *et al.*, 1994). First, delayed accounting recognition of events affecting the value of net assets of a firm that do not meet the criteria for accounting recognition in the current period, but that alter investors' current expectations about future cash flows and hence bear on the share price. The second source is the tendency of accrual accounting to delay the recognition of future benefits originating from currently recognised cash outlays – e.g., research and development expenses and advertising expenses (Kothari and Sloan, 1992). Consequently, the effects of value-relevant events are not fully recognised in current financial statements (or, more specifically, in the *UX* variable), but, again, are fully reflected in current prices, assuming market efficiency. Hence the low observed strength of relationship between current earnings and current share prices. Since both types of events eventually meet the criteria necessary for their inclusion in financial statements, a strong relationship between *current* share prices and *future* earnings is to be expected. This also suggests that the generic form of the returns-on-earnings regression is misspecified – at least one variable containing relevant available information – the current share price – is not included in the generic model in equation (2-1) above. Econometrically, this is an occurrence of the correlated omitted variable problem (e.g., Greene, 2000, pp. 334–337), discussed below in section 2.3.2. Empirical studies find support for this hypothesis. For example, apart from Beaver, Lambert and Morse (1980), Kothari and Sloan (1992) among others find that prices lead earnings by about three accounting periods. They consider up to nine years' leading earnings, but conclude that the gains from these inclusions are small (and possibly counter-productive). In the UK context, Donnelly and Walker (1995) find that prices lead earnings less in the UK than in the US. These finding directly bear upon the way in which models used in this thesis are constructed.

The second reason for the low observed adjusted R^2s and empirical estimates of earnings response coefficients related to the right-hand side of equation (2-1) is that earnings contain a value-irrelevant component. This value-irrelevant component "garbles" what would otherwise be a value-relevant or "true" accounting earnings figure. Beaver, Lambert and Morse (1980) view the accounting earnings-generating process as a mixture of the two processes. The first is a "true" earnings series that affects price – i.e., a value-relevant process, while the second process represents events that have no impact on security prices and can be econometrically treated as noise. Since noise is by definition uncorrelated with past, current or future earnings (Collins *et al.*, 1994) the actual (observed or reported) earnings are garbled, i.e., they contain measurement error. It is this definition that separates this explanation of low observed earnings response coefficients from the prices-lead-earnings explanation. There, current market price is related to future earnings. Econometrically, value-irrelevant noise induces the errors-in-variables problem in the independent variable, attenuating empirical estimates of the earnings response coefficient.

The third explanation of low observed earnings response coefficients and R^2s is termed by Kothari (2001) as the "deficient GAAP argument": if the generally accepted accounting principles (GAAP) were to be designed with the major objective of providing equity investors with information relevant in estimating the present value of future cash flows, then there should be a strong relationship between market values and accounting earnings (and possibly other accounting figures). Indeed, the strength and nature of these relationships themselves could be used as a criterion to judge the efficiency of the GAAP in providing value-relevant information to investors (Lev and Zarowin, 1999). If, however, as stated above, this was not the case and the observed relationship was weak, this would be treated as an indication of the "inappropriateness" of accounting figures to provide investors with value-relevant information (e.g., in the case of software capitalisation – Aboody and Lev, 1998) and treated as a deficiency of GAAP. Lev (1989) specifically states that:

> "... if price revisions are found to be largely unrelated to earnings, the information contribution (usefulness) of earnings to investors cannot be large." (p. 156)

Lev also emphasises the importance of metrics such as the R^2s rather than just the earnings response coefficients (i.e., estimated regression coefficients). Parts of the evidence consistent with this argument appear also in other studies, in particular regarding the decline in value-relevance. However, the decline, if present, relates more to the earnings figure itself than to the general concept of financial statements. Once certain balance-sheet items are included in the relation, the R^2s do not appear to decline unequivocally (e.g., Francis and Schipper, 1999).

The fourth explanation of low observed earnings response coefficients is the existence of transitory earnings. Given the generic model presented in equation (2-1) above, the long-term effect of an earnings change depends on the persistence of earnings. Ahmed (1994), among several other studies presented/mentioned earlier, defines persistence of earnings as the magnitude of revisions in current expectations of future earnings that result from a current earnings innovation (change). If earnings changes were purely permanent, the full value of this change would be capitalised to infinity and reflected in current market values. Simplifying earlier definitions of the earnings response coefficient and annotation, the effect of one unit of change in earnings on market values would equal the earnings response coefficient, i.e., $(1+1/r)$-units, where r is an inter-temporally and cross-sectionally constant discount rate (the required return on equity). Econometrically, purely permanent earnings can be described by a random walk process (see section 3.2.1). A number of empirical studies show that (positive) earnings and earnings changes have properties broadly consistent with an underlying random walk process, albeit it must be noted that with some deviations from it, depending on industry, the precise type of estimation, undeflated versus deflated variables and similar issues (e.g. Dechow, Kothari and

Watts, 1998; Albrecht, Lookabill and McKeown, 1977; Lookabill, 1976; Beaver, 1970).

On the other hand, earnings might contain components that are transitory in nature – i.e., they are not expected to persist into the indefinite future, in which case the strength of the response to earnings announcements is expected to be small(er). Indeed, in the case of purely transitory earnings, the earnings response coefficient would equal unity. A unit of unexpected earnings would affect the share price by just that one unit. Empirical research shows that negative earnings and earnings changes are transitory, i.e., they reverse in a major part within one accounting period. For example, Basu (1997, Table 3) reports a regression coefficient on negative earnings-levels close to –0.500, which implies that negative earnings mean-revert to the norm within two accounting periods.

There are several possible explanations for the transitory nature of earnings and negative earnings in particular. First, exogenous one-time activities such as disposals of assets, restructurings, write-offs and similar activities result in one-time, transitory gains or losses.[11] These events are, almost by definition, not expected to recur, assuming a going-concern firm in either direction. Furthermore, the limited liability of public companies and possible existence of abandonment options (Berger, Ofek and Swary, 1996; Hayn 1995; also see section 4.8.1) limit the time and/or the extent to which substantial losses can be incurred. The presence of gains or losses

[11] Exogenuous activities are activities triggered or caused by the economic environment which is external to the firm. Endogenous activities result from activities induced by managers' incentives. The difference between exogenuous and endogenouos activities is econometrically important. In the case of endogenous activities, the incentive will likely represent an omitted variable and thus produce an upward bias in the estimated earnings response coefficient (see section 2.3.2 and Kothari and Zimmerman, 1995, Appendix).

resulting from such activities is thus only temporary and earnings containing these elements are transitory.

Second, these transitory elements might be induced endogenously for contractual reasons – managers might have their own incentives to create transitory earnings components. For example, they can influence earnings either by selling assets to realise gains or by delaying, to the extent possible, the recognition of unrealised losses (Black, Sellers and Manly, 1998). Poitras, Wilkins and Kwan (2002) find that asset sales are determined jointly by the economic environment of the firm as well as managerial incentives, i.e., that asset sales are a result of a mixture of exogenous and endogenous factors. Maksimovic and Phillips (2001), using longitudinal data, are unable to rule out discretionary value-reducing asset sales. Earlier, Bartov (1993) describes and finds evidence consistent with two discretionary types of managerial behaviour – earnings smoothing and debt to equity ratio manipulation by means of timing of long-term fixed assets sales to conform to debt covenants. If managers attempt to time asset sales to manipulate earnings or the debt-to-equity ratios, they must perceive frictions in some information markets, and whether or not these activities are successful depends on the existence of such frictions (Fields, Lys and Vincent, 2000). In a capital market that processes information efficiently, investors are expected to see through such endogenous attempts to increase or decrease earnings and treat these activities as transitory. The components of earnings that reflect these activities are therefore also expected to be transitory.

The third possible explanation for the existence of transitory items is that there is demand for conservative accounting numbers. Some groups of financial statements' users will, at least in some circumstances, prefer understated assets and/or revenue figures (e.g., Anwer *et al.* 2002). For example, creditors might view understated assets as giving them a greater margin when setting debt covenants (Cotter, 1999). If the accounting system induces such a property on accounting figures, then upward adjustments must be made to reconcile accounting estimates of value and market values. For example, the Feltham and Ohlson (1995, 1996) include such adjustments in their model to reconcile market and book values of operating assets. Pope and Walker (2003) present a model that captures this type of accounting conservatism. Basu (1997), on the other hand, defines conservatism as a tendency of accountants to require a higher degree of verification for recognising gains than losses in financial statements. Therefore, in order to record a gain, accountants require a greater degree of certainty than they do for losses. The traditional view is (was) that accountants should, when in doubt, tend to understate assets and revenue and overstate liabilities and expenses (Lewis and Pendrill, 1996, pp. 17–18; see also SFAC 2 and SSAP 2 pronouncements and Davies, Paterson and Wilson, 1999, pp. 64–70).

Conservative accounting as described above thus represents one possible cause of low observed on-average relationships (earnings response coefficients and R^2s) between market values and accounting earnings. Regardless of the precise definition of this type of accounting conservatism, one of the consequences is that market values relate to accounting earnings in an asymmetric manner.[12] Anticipated losses are recognised both more often and more quickly than anticipated gains (Kothari, 2001) and increased frequency or probability of litigation in some jurisdictions contribute and strengthen this tendency (e.g., Ball, Kothari, Robin, 2000; Pope and Walker, 1999; Basu, 1997). They result in transitory components of earnings and/or other performance measures that are used as explanatory variables in models such as the model in equation (2-1). These transitory components then cause low response coefficients and low R^2s.

2.2.4 Other properties of the earnings-return relationship

Hayn (1995) introduces the notion that losses are transitory because investors have an abandonment option to discontinue operations in a firm that generates negative returns or returns that are not commensurate to the riskiness of the firm. Losses cannot persist indefinitely – they are either reversed, in which case they were by definition transitory, or the shareholders exercise their put option to discontinue firm operations. This discontinuation of operations may take the form of liquidation of assets, reorganisation of the firm, assets can be sold or merged with another firm or group of assets (Jan and Ou, 1995). A further exploration of the abandonment option is presented in detail in Berger, Ofek and Swary (1996). The concept of transitory negative earnings also applies in cases where accounting earnings are positive at face value, but are either low enough to cause the abandonment option to

[12] This presentation relates principally to ex-post accounting conservatism. More exact definitions of accounting conservatism are presented below in section 2.4. Precise definitions are required to differentiate between the effects of different types of conservatism.

become "in the money"[13] or are essentially negative, but the management has adopted some earnings-increasing accounting policies (Burgstahler and Dichev, 1997; also see Easton, 1999). These earnings are not expected to persist indefinitely but rather to reverse toward normal levels. The existence of abandonment options introduces non-linearity in the return-earnings relation in the same manner as payoffs are defined asymmetrically for a financial option. Further research in this area includes Chambers (1996) who distinguishes between one-time losses and "persistent" losses.[14] He finds that losses that extend beyond the current accounting period convey significantly less information to the market than the initial loss for firms where the accounting losses extend over a number of subsequent accounting periods. The implication is that investors gain most information about future accounting prospects of the firm from the initial loss. Martikainen (1998) makes similar distinctions between temporary and "permanent" losses.[15]

Most empirical literature employs linear regression models as the method to study empirically the relationship between earnings and returns. Imposing the linearity assumption on an essentially non-linear relationship might account in part for the observed low strength of relationship between earnings and returns in that the functional form might be inadequate. Existing research shows that extreme earnings changes, both positive and negative, are more likely to contain more transitory items. Freeman and Tse (1992) as well as Ali and Pope (1995) on UK data use an arctan transformation that produces an S-shaped curve description of the relationship

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[13] Hayn terms such earnings as "temporarily depressed earnings", defined as earnings that, when capitalised appropriately, are lower than the liquidation value.
[14] The term "persistent losses" is included in inverted commas to diffrentiate the use of the term from other uses in this thesis. Losses by the very same reasons described earlier in this section cannot perisist indefinitely.
[15] The term "permanent" is included in inverted commas again for the same reasons as in footnote 14.

between returns and earnings – convex for bad news and concave for good news. Therefore, the marginal response of prices to earnings is allowed to vary with the magnitude of the earnings measure. The earnings response coefficient is smaller when earnings changes are extreme and more likely contain more transitory components and is bigger when earnings changes are smaller and contain more permanent (less transitory) components. Das and Lev (1994) report similar findings for a more general class of transformations and involving alternative non-parametric methods of estimation (locally weighted regression). They also find that special items increase non-linearity in their returns-earnings relationship, that the relationship is non-linear even when one adjusts for the levels of cash flow or accruals contained in earnings and that the returns-cash flow relation itself is also non-linear. These are all findings that bear upon the findings presented later in this thesis. However, Beneish and Harvey (1998) caution that the non-linearities observed in previous research are, at least in part, due to measurement errors rather than to a non-linear relationship between (abnormal) returns and (unexpected) earnings and that the gains of accounting for potential non-linearities are likely to be small. Lipe, Bryant and Widener (1998) use an absolute-value quadratic transformation that allows preserving the sign of earnings surprise. They find that non-linearity, losses and firm-specific factors are economically distinct factors affecting the returns-earnings relationship. Cheng, Hopwood and McKeown (1992) observe that the effects of non-linearity may be severe. The R^2s in their empirical estimations increase by a factor of two to three when they control for non-linear relationships between cumulative abnormal returns and unexpected earnings. Subramanyam (1996) provides a theoretical framework for the observed non-linearities. There are other factors that might affect the returns-earnings relationship.

For example, Choi and Jeter (1992) find that the earnings response coefficients decrease in the period after the issuance of a qualified audit opinion. They ascribe this finding either to increasing noise in earnings or to the changes in earnings persistence or both.

The empirical research presented in this thesis expands upon the transitory-earnings explanation, in particular the effects of accounting conservatism. To the extent possible, it conditions some of the results on the sign of accounting earnings and its two main components (cash flows and accruals) with the observation that negative earnings in particular are transitory. The particular methods used later in this thesis are a result, at least in part, of different resolutions of the main econometric problems presented below in section 2.3. These problems prevent correct inferences regarding the nature of the relation between market values and accounting numbers to be made. They are presented next.

2.3 MAIN ECONOMETRIC ISSUES

2.3.1 The errors-in-variables problem

The presentation of econometric problems resulting from transitory earnings is based on Kothari and Zimmerman (1995) and Kothari (2001), while the econometric derivations are combined from Greene (2000, pp. 375–380) and Johnston and DiNardo (1997, pp. 153–156). Reported accounting earnings X_t can be viewed, in general, as a linear combination of two components: a permanent, value-relevant component (i.e., a component perfectly positively correlated with the market values), x_t, and a transitory, value-irrelevant component, u_t, which has no impact on the share price (Beaver, Lambert and Morse, 1980):

$$X_t = x_t + u_t \tag{2-3}$$

Econometrically, x_t is represented by a random walk model: $x_t = x_{t-1} + e_t$ and $E[x_t] = x_{t-1}$, where e_t is a random, normally-distributed error term with parameters $N \sim (0, \sigma^2_e)$. Also, e_t and u_t are assumed to be uncorrelated, $\text{cov}(e_t, u_t) = 0$. If the two components of the earnings process in equation (2-3) could be identified, they could be used as separate independent variables in a regression model, two separate estimated regression coefficients and thus two "partial" earnings response coefficients would result. The theoretical earnings response coefficient on the transitory component u_t equals unity – the transitory component affects reported accounting earnings only in the period in which it occurs and does not occur again. On the other hand, as shown earlier, the theoretical earnings response coefficient on the permanent component x_t is $\beta_{perm.} = (1+1/r)$ – the permanent component of reported earnings repeats itself in all future accounting periods and is capitalised into the current market value. The earnings response coefficient on the permanent component therefore represents one plus the average price-earnings ratio, or the earnings multiplier. To obtain the "total" earnings response coefficient, these two estimated regression coefficients would have to be summed. In terms of estimating some particular form of the model in equation (2-1), the following limits on the value of the estimated earnings coefficients would thus be expected: $1 \leq \hat{\beta} \leq (\beta_{perm.}=(1+1/r))$ if accounting earnings comprise of the two separately-identifiable components.

If, however, the two components of reported accounting earnings X_{it} were not separately identifiable, then the transitory, value-irrelevant component u_t would act as a measurement error in the independent variable. The consequences of the errors-in-variables problem are illustrated below.

One specific empirical model derived from the generic model in (2-1) is the deflated price-levels model (Kothari and Zimmerman, 1995):[16]

$$\frac{P_{it}}{P_{i,t-1}} = \alpha + \beta \frac{X_{it}}{P_{i,t-1}} + \omega_{it} \tag{2-4}$$

In terms of the notation presented above and equation (2-3), the estimated value of $\hat{\beta}$ will fall in the interval between 1, if observed accounting earnings X_{it} is constituted of purely transitory earnings u_{it}, and $(1+1/r)$ if observed accounting earnings X_{it} is constituted of entirely permanent earnings x_{it}, given that β is a sum of two independent variables with their own "true" regression coefficients. In an alternative nomenclature, X_{it} may be termed as observed earnings, x_{it} "true" earnings and u_{it} the measurement error.

[16] This particular form has been selected to separate out the second serious problem of empirical versions of equation (1), namely the scale effects. Also, under the assumption that earnings consitute the only value-relevant information to the market, deflated-earnings (i.e., earnings yield) models are equivalent to deflated-earnings changes models (Donnelly and Walker, 1995). Thus, this particular form is not limiting. Some variants of this model are also used in an emerging-market context (Jindrichovska, 1995).

However, in the earnings response coefficient/permanent-transitory earnings context, the interest lies not in the relationship between published earnings measures that include transitory (i.e., value-irrelevant) items, as in equation (2-4), but rather in the relationship between prices and earnings measures that contain only those components that are value-relevant:

$$\frac{P_{it}}{P_{i,t-1}} = \alpha + \beta \frac{x_{it}}{P_{i,t-1}} + \omega_{it} \tag{2-5}$$

Substituting (2-4) into (2-5) yields:

$$\begin{aligned}\frac{P_{it}}{P_{i,t-1}} &= \alpha + \beta\left(\frac{X_{it}}{P_{i,t-1}} - \frac{u_{it}}{P_{i,t-1}}\right) + \omega_{it} = \alpha + \beta\frac{X_{it}}{P_{i,t-1}} - \beta\frac{u_{it}}{P_{i,t-1}} + \omega_{it} = \\ &= \alpha + \beta\frac{X_{it}}{P_{i,t-1}} + \left(\omega_{it} - \beta\frac{u_{it}}{P_{i,t-1}}\right)\end{aligned} \tag{2-6}$$

The estimate of the true regression coefficient, $\hat{\beta}$, equals:

$$\hat{\beta} = \beta + \frac{\sum X_{it}\left(u_{it} - \beta\frac{u_{it}}{P_{i,t-1}}\right)}{\sum X_{it}^2} \tag{2-7}$$

and

$$plim(\hat{\beta}) = \beta - \frac{\beta\sigma_u^2}{\sigma_x^2 + \sigma_u^2} = \beta\left(\frac{\sigma_x^2}{\sigma_x^2 + \sigma_u^2}\right) \tag{2-8}$$

Equations (2-6) to (2-8) show that when the true underlying relationship between market value and accounting earnings is represented by equation (2-5), but one attempts in practice to estimate model (2-4) because the only available earnings figure is the published or the observed accounting earnings rather than permanent earnings, the error term in such a regression is not independent of the regressor (the independent variable). The consequence is that the estimator $\hat{\beta}$ of the true β is biased downwards. If the variable of interest – in this case permanent earnings, was measured without error (or, equivalently, the earnings figure used was entirely value-relevant) so that $X_{it}= x_{it}$, the second term in equation (2-7) would equal zero, since the measurement error u_{it} would equal $u_{it}= 0$ for all firms i and time periods t. Alternatively, the variance of such a (non-existent) error term would equal $\sigma^2_u= 0$ and the term in brackets on the right-hand side of equation (2-8) would thus equal $\sigma^2_x/(\sigma^2_x+\sigma^2_u)= 1$. In other words, had the reported accounting earnings figure consisted only of the value–relevant permanent earnings component, the empirical earnings response coefficient would equal the theoretically-expected earnings response coefficient, that is $\hat{\beta} = (1+1/r)$.[17]

At the other extreme, if the reported earnings figure consisted only of a transitory element so that $X_{it}= u_{it}$, the term in brackets in equation (2-8) would equal zero, since the numerator $\sigma^2_x= 0$ and the denominator strictly $\sigma^2_u>0$. The empirical estimate of the earnings response coefficient would then equal 1+0= 1.

[17] In this exposition, the cross-sectional and intertemporal independence of all observations, as shown by the absence of either index i or t in regression coefficients, is assumed.

At any point in the interval between these two extremes the empirical estimate of the earnings response coefficient will be biased. It follows from equation (2-8) that regardless of the sign of the observed relation between market value and accounting earnings, the estimated regression coefficient will be biased towards zero. This bias is termed the attenuation bias. The magnitude of the bias depends on the term in brackets in equation (2-8) – i.e., on the relative sizes of the variances of permanent earnings and transitory earnings that act as the measurement error. It must be noted that the magnitude of this bias is not observable, since neither the variance of the value-relevant portion (σ^2_x) nor the variance of the value-irrelevant portion (σ^2_u) is in practice observable to the researcher.

Moreover, such estimates of the earnings response coefficient will be inconsistent. A consistent estimator should approach the true value of the parameter $plim\,\hat{\theta}_n = \theta$ as the sample size n increases indefinitely. From equation (2-8) above it is apparent that in the case of the errors-in-variables problem, the estimated earnings response coefficient will not only be biased, but that this bias will not tend to zero as the sample size increases indefinitely. Thus, in the presence of transitory earnings, the estimated earnings response coefficient is inconsistent as well as attenuated.

In cases when only one regressor is measured with error, a relatively simple solution to the errors-in-variables problem is available. For example, in accounting contexts, the "reverse" regression is often applied (e.g., Beaver, Lambert and Morse, 1980; Collins and Kothari, 1992; Basu, 1997; Pope and Walker, 1999): the accounting earnings variable measured with error serves as the dependent variable, while the market value variable, assumed to be measured without error in an efficient capital market, serves as the independent variable. When the dependent variable is measured with error, but (all of) the independent variables are error-free, the regression coefficient is unbiased. However, since the random measurement error and the true regression errors are merged in the empirical error estimate, the usual consequence is a lower explanatory power of such regressions evidenced by lower R^2s (Greene, 2000, p. 376). In terms of the generic model, represented in equation (2-1), a simple generic reverse regression model designated to deal with the measurement error might be the following:

$$UX_{it} = \gamma + \delta CAR_{it} + v_{it} \tag{2-9}$$

where δ is the return response coefficient. The return response coefficient is the inverse of the earnings response coefficient (δ=1/β) and this inverse represents the theoretical upper limit of the return response coefficient. All interpretations of economic determinants, discussed above, must therefore be inverted when the subject of interpretation is the return response coefficient. Collins and Kothari (1989) employ just such a model to study the economic determinants of the earnings (return) response coefficients.

However, the solution to the errors-in-variables problem is not readily available in cases where there are more regressors measured with error. One such context is in the Feltham and Ohlson's (1996) linear-dynamics model in a multiple-equation setting (e.g. Dechow, Hutton and Sloan, 1999; Barth *et al.*, 1999). Another setting represents cases where reported accounting earnings are negative. In the case of loss firms the need is often to include additional variables in regressions that attempt to measure the underlying true value-relevant variables with error. For example, Collins, Pincus and Xie (1999) find that including the book value serves as a proxy for i) future normal earnings, ii) the value of the abandonment option if a firm is to be liquidated, and iii) as a proxy for scale. The book value included in these regressions almost inevitably measures these three constructs with error. Another application where this problem might arise is the use of the deflated book value (the book-to-market ratio) or any other "stock" variable as a control for the level of pervasive conservatism in accounting (e.g., Pope and Walker, 2003). While Pope and Walker (2003) avoid including the book-to-market ratio directly in their regressions and re-estimate their models by book-to-market deciles instead, including the ratio directly would represent an alternative errors-in-variables method of estimation.

While no general solution to the problem of measurement error in multiple independent variables is available, some special cases have been solved with different approaches. Black, Berger and Scott (2000) relax the assumption that the true independent variable and the measurement error term are un-correlated; Klepper (1994) develops regression diagnostics when all independent variables might be measured with error and assuming the error is not correlated with the true variable of interest. Other approaches have been developed (e.g., Machuga, 2000; Dagenais and Dagenais, 1997; Lewbell, 1997; Dagenais; 1994; Klepper, 1988; Klepper and Leamer, 1984). Some of these have been applied specifically in the capital market-based accounting research context in estimating the earnings response coefficient. For example, Cready, Hurtt and Seida (2000) apply the method developed in Klepper and Leamer (1984). The technique essentially involves regressing every variable entering the model (both dependent and independent) on all other variables and establishing bounds on the estimated regression coefficients.

None of the works cited above have been used explicitly in this thesis, given that the "reverse" form of empirical models "automatically" precludes (pre-empts) the errors-in-variables problem to affect the main conservatism measures that are based on estimated regression coefficients. However, the acknowledgement of the errors-in-variables has directly contributed to the development of the "reverse" regression technique generally used in the ex-post conservatism literature as well as in this thesis and is presented here accordingly.

2.3.2 *Scale (size) effects*

The second principal econometric problem that affects the models used in related literature as well as in this study is related to scale effects. Empirical estimations of the generic model in the form of price-level regressions, such as the undeflated version of the model presented in (2-5) above, as set out in equation (2-10) below, with or without book value often yield models with high R^2s. For example, Garrod and Valentincic (2005) report R^2s resulting from estimations of their valuation models on a long UK sample (196-2001) to be in the range from 41% to 56% which is much higher than the more common range 5%-15% in such empirical investigations (e.g., Lipe, Bryant and Widener, 1998). Although Garrod and Valentincic (2005) deflate their variant of the residual income model with three different deflators (i.e., scale measures) – book value, earnings and sales, some scale effects might still be present because they do not deflate the accounting variables with lagged price (Easton, 1999; also 1998), thus causing higher R^2s than they would otherwise be. The following illustration represents an attempt to illustrate the effects of scale following the exposition in Barth and Kallapur (1996).

Assume, first, that the true relationship between price (P_{it}) and reported accounting earnings (X_{it}) is described by the following undeflated levels-model (Kothari and Zimmerman, 1995):

$$P_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \tag{2-10}$$

where ε_{it} is a random error distributed normally $N\sim(0,\sigma^2_{\varepsilon})$. Note that the distribution of this error term ε_{it} is homoscedastic, i.e., its value does not increase with the value of the independent variable X_{it}. In practice, however, because scale effects are present in accounting and/or possibly in the market variables, the observed (as opposed to the underlying or "true") relationship between price and accounting earnings is:

$$(P_{it}S_{it}) = (\alpha S_{it}) + (\beta X_{it}S_{it}) + (\varepsilon_{it}S_{it}) \tag{2-11}$$

where S_{it} is a measure of scale for a particular firm i in period t. Several empirical measures of scale (S) have been proposed in the literature. The most common measures of size include the opening market capitalisation (share price) (e.g., Easton, 1999) and accounting earnings, book values or sales (e.g., Garrod and Valentincic, 2004). Less-often used measures used in empirical applications include the amount originally invested in the firm (Barth and Kallapur, 1996) and the amount of the depreciation charge (Christie, 1987). Both of these measures are expected to be large for large firms while at the same time bearing no relationship with the determinants of the current value of the firm.[18] The underlying assumption is that scale, S_{it}, is not correlated with either P_{it} or X_{it}.

In empirical applications, models based on equation (2-10) would generally take the following form:

$$(P_{it}S_{it}) = \gamma + \delta(X_{it}S_{it}) + \omega_{it} \qquad (2\text{-}12)$$

Assuming (2-12) could be estimated (which would require the knowledge of the scale factor S), the estimated regression coefficient $\hat{\delta}$ will generally differ from the estimated regression coefficient $\hat{\beta}$ from equations (2-10) and (2-11) because:

- the model in equation (2-12) omits the scale factor S_{it}, an independent variable correlated with the independent variable ($X_{it}S_{it}$) included in the regression;
- the model in equation (2-12) has an intercept, while the equation (2-11) does not;
- since the error term is defined as $\omega_{it} = S_{it}\varepsilon_{it}$, the model in (2-12) violates the contemporaneous ordinary least squares assumption of homoscedasticitiy (i.e., the error term ω is a function of the scale factor S and thus varies with S).

[18] This study shows explicitly the properties of the depreciation expense regarding the prediction of future cash flows.

Barth and Kallapur (1996) show that under the assumptions and circumstances presented above, the estimated coefficient $\hat{\delta}$ in equation (2-12) – the estimated earnings response coefficient – will be biased in the following manner:

$$E(\delta) = \beta + \frac{\alpha\overline{X} / \sigma_X^2}{1 + \frac{\overline{S}^2}{\sigma_S^2} + \frac{\overline{X}^2}{\sigma_X^2}} \qquad (2\text{-}13)$$

where the second term on the right hand side of equation (2-13) represents the bias term. Since the denominator of the bias term is always positive (only squared terms are included), and since negative intercepts (α) are not common in accounting models such as (2-10) (however, see, for example, Collins, Pincus and Xie, 1999), the direction of the bias will depend on the sign of the mean of the variable X_{it}, $\overline{X}$. Generally, one would expect the mean of accounting earnings $\overline{X}$ to be positive on average, since there are usually many more profitable than loss-making firms.[19] Alternatively, negative book values as a stock variable are sometimes observed, however such cases are almost always excluded from empirical analyses.[20] Generally, the observed earnings response coefficients in the presence of scale effects should thus be biased upwards. In other words, the estimated earnings response coefficients from such regressions without appropriate controls for scale will be overstated – the effect of a unit change in (unexpected) earnings will overestimate the significance of this change for future earnings and thus for future cash flows and, consequently, their present value and thus the market values.

[19] For example, there are 12,5% loss observations (firm-years) in the main contemporaneous sample used in in this research.
[20] This study too excludes firms with non-positive book values (see section 4.2 for details on sample selection).

If a relevant variable that is correlated with the variable included in the model is excluded from the model, this results in the correlated omitted variables problem. The consequences of this problem are that both the estimated regression constant and the estimated regression coefficient in models like (2-10) are biased and inconsistent and, moreover, the disturbance term is estimated incorrectly – it is biased upwardly (Gujarati, 2003, pp. 510-513; Greene, 2000, pp. 334-337). This last property is less problematic in the present context given that it reduces only the explanatory power of models. Even if an omitted variable is orthogonal on the included variable, the error term is still biased and correct inferences based on the estimated R^2 are difficult (albeit, again, in a direction that is usually not an issue in capital market-based accounting research).

Easton and Sommers (2003, 2000) emphasize that scale effects are more than just the notion that large firms will have large values of accounting variables. The relationship between market and accounting variables might be different for smaller than for large firms, inducing a non-linear relationship analogous to, for example, Freeman and Tse's (1992) differences in earnings response coefficients for large and small unexpected earnings.

There are two possible approaches to solve the scale effects – deflation of variables affected by scale and the direct inclusion of a scale proxy as an independent variable. Barth and Kallapur (1996) advocate the latter approach and argue that deflation may have unpredictable effects on coefficient bias, heteroscedasticity and efficiency of estimation. Lev and Thiagarajan (1993) also include market capitalisation as an independent variable in their sensitivity analyses. Scale proxies used in the empirical literature include: total sales, book value and market value of equity, total assets, net income, number of shares and lagged (opening) price, effectively changing the modelling to returns-earnings yield formulation of the generic model in (2-1) (Easton, 1999) of the type presented above in equation (2-5). The inclusion of scale directly as a proxy may have other roles – e.g., in examinations of the effects of political costs (Christie, 1987). Also, Garrod and Valentincic (2005), among others, caution that deflation by the number of shares does not eliminate the scale effect, given that the number of shares is a variable at the discretion of managers. A small number of shares will result in large per share values while a large number of shares will result in smaller per share values for an otherwise economically identical firm. Recent papers that explore further the effect of scale on price-level models include Barth and Clinch (1999), Easton and Sommers (2003) and Akbar and Stark (2003).

In this research, Easton's (1999) recommendation is followed "automatically" given that deflation by lagged price follows from Pope and Walker (1999). Accounting variables and current prices are deflated by opening prices $P_{i,t-1}$ (or $P_{i,t-4}$ in lagged models) thus eliminating, to a large extent, the effects of scale. If, however, opening prices were only an imperfect measure of scale, the problems described above would arise. Also, note that apart from the errors-in-variables problem, correlated omitted variables and scale effects, there are other possible methodological issues in estimating the earnings response coefficients. For example, a series of studies discuss the earnings-levels versus earnings-changes form of models such as (2-4) and (2-10) above (e.g., Easton and Harris, 1991; Kothari, 1992;

Ali and Zarowin, 1992; Ohlson and Shroff, 1992; Watts and Zimmerman, 1995). The precise mechanics of these various forms of models are not explored here in detail, given that they are not directly used in this study. However, it must be noted that authors reduce the econometric consequences of various specifications of these models either to the errors-in-variables problem (e.g., Ali and Zarowin, 1992) or to a correlated omitted variables problem (Brown, Lo and Lys, 1999). Thus the above presentation represents a framework to consider other possible problems that arise in studies such as the present study.

2.4 ACCOUNTING CONSERVATISM

Definitions of accounting conservatism originate from two broad sources: accounting standards/legal framework literature and academic literature. In this section the various definitions of accounting conservatism are presented, starting by presenting the relevant "official" definitions from regulatory texts in a way similar to Giner and Rees (2001) and Givoly and Hayn (2000).[21] These definitions are then followed by definitions used in academic empirical research, where certain conflicts and interactions between two different types of accounting conservatism are exposed and linked to regulatory definitions.

There are three important regulatory definitions of conservatism from three major regulatory bodies. First, in the Accounting Standards Board's *Statement of*

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[21] The term "official" is in inverted commas already in Givoly and Hayn (2000).

Principles for Financial Reporting (ICAEW, 2001) issued in December, 1999, the term "prudence" is defined as:

> "... the inclusion of a degree of caution in the exercise of the judgements needed in making the estimates required under conditions of uncertainty, such that gains and assets are not overstated and losses and liabilities are not understated. In particular, under such conditions it requires more confirmatory evidence about the existence of, and a greater reliability of measurement for, assets and gains than is required for liabilities and losses." (quoted in ICAEW, 2001, p. 35, para. 3.19)

Thus, the recognition of liabilities and losses requires less verifiability than the recognition of assets and gains (Watts, 2003).[22] It also specifies that prudence is only necessary in conditions of uncertainty, which is stressed again in para. 3.20 (*ibid.*, p. 35). Also, further explanation is given that prudence may interfere with unbiasedness and warning is given that the application of prudence should not result in deliberate understatement of assets and gains and overstatement of liabilities and losses (*ibid.*, p. 89, para. 21-23). Already as early as in Scott (1926) and Devine (1963) the case is put forward against a deliberate understatement of assets (inventory, in this case). Sterling (1967) provides several examples of the different views on accounting conservatism prevalent at the time.

The second regulatory source is the Financial Accounting Standards Board in the US, which refers to prudence at several points in different documents. First, both the Statement of Financial Accounting Standards No. 5 – *Accounting for Contingencies* and the Statement of Financial Accounting Concepts No. 2 –

[22] Verifiability implies that a number of measurers are likely to obtain the same (accounting) measure (Delaney *et al.*, 2003, p. 26; FASB, 1980, p. 33).

Qualitative Characteristics of Accounting Information, refer to the APB Statement No. 4, para. 171, where conservatism is referred to in the following manner:[23]

> "Frequently, assets and liabilities are measured in a context of significant uncertainties. Historically, managers, investors, and accountants have generally preferred that possible errors in measurement be in the direction of understatement rather than overstatement of net income and net assets. This has led to the convention of conservatism..." (FASB, 1975, p. 22, para. 83; FASB, 1980, p. 35, para. 91)

This statement would represent a scaled-down version of a more extreme stance compared to the one in Ball and Shivakumar (2004). They quote Watts and Zimmerman's (1983, pp. 205-206) definition of conservatism that states assets should be reported at the lowest value available, liabilities at the highest, revenue recognised later and expenses sooner. Thus, at the extreme, Ball and Shivakumar (2004, p. 9) comment that:

> "...accounting is conservative if it simply delays revenue recognition by one period, or subtracts a constant from earnings every period independent of current economic gains and losses. "

However, the following quote from SFAS 5 (FASB, 1975) again quoting the APB Statement No. 4, para. 35, is similar and yet it represents an important concept that relates conservatism to economic events:

> "The uncertainties that surround the preparation of financial statements are reflected in a general tendency toward early recognition of unfavourable events and minimization of the amount of net assets and net income. " (FASB, 1975, p. 22)

Following the first part of this statement, "unfavourable [economic] events" must happen first, then it is decided when to include them in financial statements

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[23] The terms "prudence" and "conservatism" are intended to mean the same phenomenon. The Financial Accounting Standards Board explicitly acknowledges this in *SFAC* 2 (1980):

> "There is a place for a convention such as conservatism – *meaning prudence* – in financial accounting and reporting..." (p. 35, para. 92, emphasis added).

(Elliott and Shaw, 1988), and, finally, the preference or tendency is for an early recognition. This may be taken as an indication of the asymmetric timeliness concept introduced later by Basu (1997) that bad economic news are recognised more timely than good economic news. This also differs from the extreme stance presented in (criticised by) Ball and Shivakumar (2004) that relates to mere minimisation of assets/maximisation of liabilities and delayed recognition of revenue/earlier recognition of expenses. The increased timeliness referred to above cannot be achieved by expensing early, because there must first be an unfavourable economic event and only then it is being recognised in financial statements (i.e., causality is implied). However, the ending of this statement again returns to Ball and Shivakumar (2004) example of "subtracting a constant".

Further, conservatism is also defined by FASB (1980) explicitly in para. 95:

> "Conservatism is a prudent reaction to uncertainty to try to ensure that uncertainties and risks inherent in business situations are adequately considered." (FASB, 1980, p. 36, para. 95)

This does not imply deliberate and consistent understatement of net assets and profits and this is explicitly acknowledged in para. 93 (*ibid.*). Conservatism introduces bias in financial reporting and as such it conflicts with a number of qualitative characteristics of financial reporting (e.g., neutrality, comparability, etc.). Moreover, the Financial Accounting Standards Board notes that understated assets often lead to overstated net income in subsequent years (*ibid.*, para. 94), so the bias introduced by conservative accounting will more likely influence the timing, rather than the amounts of income over the lifetime of an economic asset (*ibid.*, para. 96). This position remains unchanged to date (e.g., Delaney *et al.*, 2003, p. 27). Also, Givoly and Hayn (2000) cite several sources that emphasise that minimisation of assets, maximisation of liabilities, delaying revenue and recognising expenses early should be viewed cumulatively through time rather than only within one accounting period.

At the limiting point, the following statement from SFAS No. 5 – *Accounting for Contingencies* (FASB, 1975) that discusses comments received from an earlier Exposure draft and Discussion memorandum is interesting:

> "On the grounds of conservatism, some respondents supported accrual of estimated losses from loss contingencies before available information indicates that it is probable that an asset has been impaired or a liability incurred. " (p. 22, para. 82).

Therefore, there might be situations where losses are accrued, but as time passes, some conditions that had originally lead to the accrual of losses might not materialise and so the original accrual would represent an "overreaction". This is an extremely important point in that it facilitates the explanation of a part of the Pope and Walker (1999) modelling of asymmetric timeliness – they explicitly allow in their model for *over*reaction to bad news, not just the mere reaction.

The third source of "official" definitions of prudence can be found in the 4th EEC Directive (1978) and subsequent amendments (CONSLEG 1978L0660 — 17/07/2003) in Section 7 (Valuation rules), Article 31:

> "... items shown in the annual accounts are valued in accordance with the following general principles...
>
> ... (c) valuation must be made on a prudent basis, and in particular:
>
> (aa) only profits made at the balance sheet date may be included,
>
> (bb) account must be taken of all liabilities arising in the course of the financial year concerned or of a previous one, even if such liabilities become apparent only between the

date of the balance sheet and the date on which it is drawn up..." (CONSLEG, 2003, pp. 18-19)

Giner and Rees (2001) observe that there is no explicit distinction between the balance-sheet conservatism and income statement conservatism in the definition of prudence in the 4th EEC Directive, but that the two types of conservatism are related if clean surplus accounting is used. Even when there are no specific requirements from either an International Accounting Standard (now termed International Financial Reporting Standard) or interpretations from the Standing Interpretations Committee (SIC), management should, according to IAS 1 – *Presentation of Financial Statements* (*Revised* 1997), produce financial statements that include information that is:[24]

"... (b) reliable in that they [the information]... (iv) are prudent. ..." (EC, 2003, IAS 1, para. 20)

To sum up this presentation of "official" references: the concept of prudence or conservatism is included in several regulatory statements, albeit not in a consistent manner. There are two broad groups of conservatism that are apparent from these definitions. Using the first definition based on the statements above, a firm would be considered conservative if it tended to show assets in the balance sheet at lower rather than at higher valuations, show liabilities at higher rather than at lower valuations, recognise revenue later rather than sooner and recognise expenses sooner rather than later. These decisions are not related to economic news.

[24] International accounting standards (with the exception of IAS 32 – *Financial instruments: disclosure and presentation* and IAS 39 – *Financial instruments: recognition and measurement*) were endorsed by the European Commission on the 29th September 2003 in Commission Regulation (EC) No. 1727/2003 (Official Journal of the European Union, 2003) in accordance with an earlier regulation (EC) 1606/2002. International accounting standards are now termed International Financial Reporting Standards.

Giner and Rees (2001) present the case of a zero net present value project that is expected to generate profits over the years and where the firm has to make choices regarding the recognition of these profits. The firm can be more or less conservative (or prudent) in this recognition of profits. However, given that the project is a zero net present value project, there is no change in market value of equity that is precisely the proxy that Giner and Rees (2001) and most other conservatism studies cited below use to infer the arrival of and the effect of economic news. Therefore, by definition, the conservatism of this type is not related to economic news. Second, there is reference at some points in these statements that bad economic events should be recognised earlier rather than later. This implies that economic events trigger decisions related to this second type of conservatism. Therefore, if a firm recognises a bad economic event sooner rather than later, it is considered to be more conservative.

These two types of conservatism are connected with two distinct types of theoretical and empirical research in this area. Regarding the latter type of conservatism, the influential empirical paper by Basu (1997) and subsequent theoretical work/explanation of his results by Pope and Walker (1999) as well as other empirical applications (e.g., Ball and Shivakumar, 2004; Beekes, Pope and Young; 2003; Giner and Rees, 2001; Kothari, 2001; Ball, Kothari and Robin, 2000; Givoly and Hayn, 2000; Basu, Hwang and Jan, 2000) define accounting conservatism in terms of asymmetric earnings timeliness. Earnings timeliness is the degree to which current-period accounting earnings reflect current-period value-relevant information – economic income. Economic income is proxied for by the changes in market value of the firm (i.e., returns, usually excluding dividends).

Positive changes in the market value of the firm are termed "good news" and negative (non-positive) changes in market value are termed "bad news". Easton (1999) denotes this definition of timeliness as the timeliness of the accounting summary and he distinguishes it from timeliness of accounting information that focuses on investors' use of accounting information in decision-making.

Based on this concept, accounting conservatism is then defined to be the degree of asymmetry with which current-period accounting earnings respond asymmetrically to good and bad economic news. Stated somewhat differently, conservatism requires a higher degree of verification to recognise good economic news than to recognise bad economic news in financial statements or, alternatively, the probability of timely recognition of bad news in accounting earnings is higher than for good news (Basu, 1997). Similarly, Holthausen and Watts (2001) define "conservatism of the earnings number" as a form of conservatism that anticipates losses but not gains so that market values reflect gains earlier than accounting earnings, while losses are incorporated contemporaneously in both market values and accounting earnings. This definition also rests on the premise of asymmetric recognition of good and bad news. Also, the changes in the market value of equity and accounting income are viewed as two distinct measures of performance. Kothari (2001) adds that economic losses are recognised not only more quickly, but also more often. At the extreme, Watts (2003) defines this type of conservatism as

> "the degree to which profits are not anticipated." (p. 10)

This type of conservatism is termed differently in the literature. Some examples are: ex-post conservatism (indicating that economic events must occur first), news-related conservatism, income statement conservatism (a consequence of the fact that the primary focus of existing research is the different earnings figures) (e.g., Pope and Walker, 2003) and conditional conservatism. This latter term is due to Ball and Shivakumar (2004) and Beaver and Ryan (2004) who explicitly define conservatism as the asymmetric reaction to good and bad economic news, i.e., a reaction conditional on the arrival of news. Finally, Pope and Walker (2003) indicate an alternative term – event-driven conservatism. Thus, these alternative terms stress the asymmetric timeliness of earnings relative to (conditional on) good and bad economic news.

The other type of conservatism is defined in, or is the focus of, or is used in papers by Pope and Walker (2003), Watts (2003), Penman and Zhang (2002), Zhang (2000), Beaver and Ryan (2004, 2000), Hayn and Givoly (2000), Myers (1999), Dechow, Hutton and Sloan (1999), Feltham and Ohlson (1995, 1996). Following the exposition in Pope and Walker (2003), accounting is conservative if the applied accounting depreciation rate is higher than the economic rate of depreciation, the economic rate of depreciation being the rate at which operating cash flows resulting from investment decay through time. If the accounting depreciation rate is higher than the economic rate of depreciation, this indicates that operating cash flows resulting from a particular asset decay less quickly (i.e., they are more persistent) than the accounting process records the decay of the originating operating asset. This results in the market value of shareholders' equity being on average higher than the book value of equity. Equivalently, unrecorded goodwill does not, on average (i.e., over sufficiently long periods of time), equal zero.

This kind of accounting conservatism is not related to economic news. On a time-line, it is applied earlier than ex-post conservatism and is related to the upfront choices among different accounting (asset-recognition) methods (Basu, 2001). At the time the firm makes an investment and before any economic event affects the asset, the firm:

> "...pre-commits the firm to accounting for the asset on the basis of a pessimistic prognosis of future cash flows that the asset is expected to generate. " (Pope and Walker, 2003, p. 2)

Only later may (or, indeed, may not) economic events arise and their economic effects be recognised in financial statements in general and in accounting earnings and components in particular. Because varying degrees of conservatism do not depend on (are not conditional on) economic news, it is also termed unconditional conservatism (Ball and Shivakumar, 2004; Beaver and Ryan, 2004). Another term used is pervasive conservatism (e.g., Giner and Rees, 2001).

Different assumptions about the ability of an asset to generate future cash flows denote varying levels of ex-ante conservatism. Two limiting points can be identified. On the one side, an extremely pessimistic expectation of the ability of the asset to generate future cash flows would lead the firm to completely expense an investment in an operating asset through the profit and loss account, rather than capitalise it.[25] The amount invested would thus never appear on the balance sheet. This is equivalent to applying immediately an accounting depreciation rate of 100%. This also implies that the accounting depreciation charge would be fully transitory and evolve entirely within the current accounting period. Thus, unless the asset does

[25] Zhang (2000) notes that accounting conservatism relates primarily to operating assets, and less (or not at all) to financial assets, following Modigliani and Miller (1961) assumption that borrowing and lending are zero net present value activities.

not generate a single monetary unit of cash flows, the accounting depreciation rate would exceed the economic rate of depreciation. Such an accounting policy is denoted as extremely ex-ante conservative in that this is the most "pessimistic prognosis" of future cash flows a firm can make.[26] Nevertheless, Zhang (2000) notes that if a particular investment – he uses the example of R&D – does in fact not produce any future cash flows, the accounting policy is, in that particular case, unbiased and not conservative. These relations must thus be considered on average (asymptotically).

On the other side, in an extremely ex-ante aggressive, un-conservative or imprudent, as termed in SFAC No. 2 (FASB, 1980, p. 37) or liberal accounting system, as termed in Penman (2003, pp. 562–581), the firm would capitalise an investment on the balance sheet as an operating asset and then, at the extreme, never depreciate it at all. In less extreme versions, the accounting depreciation rate would merely not exceed the rate of decay of operating cash flows the asset is expected to generate (i.e., the economic rate of depreciation). In the extreme case, the investment would always be shown on the balance sheet as an asset at its original (historic cost) value.[27] With the passage of time, the asset would be economically consumed – the sum of cash flows still expected to be generated by the asset would diminish. It is likely that the market value of such an asset would tend toward zero over time as the asset is economically depreciated while its book value would remain unchanged at

[26] It is assumed firms would not invest in projects expected to generate no cash inflows but that would create only liabilities for the firm. The term "pessimistic prognosis" is due to Pope and Walker (2003).
[27] The literature does not discuss the case of a liberal accounting system where, in addition to keeping the assets in the balance sheet at historic cost, with upward revaluations would be allowed or even required.

the historic cost or at least decrease at a slower rate than the rate of decay of cash flows.

Somewhat differently, Watts (2003) states that if a firm is ex-ante conservative, asset increases (gains) that are not verifiable are not recorded in financial statements, while decreases of a similar degree of verifiability are. This results in net assets being "understated", i.e., recorded in financial statements at below their market value and the book-to-market ratio will be above zero. Penman and Zhang (2002) define accounting to be conservative if firms choose:

> "...accounting methods that keep the book values of net assets relatively low." (p. 238)

They also provide a few typical examples of (US) conservative practices: LIFO rather than FIFO inventory valuation method in circumstances of rising inventory costs, expensing R&D expenditures instead of capitalising them in the balance sheet and amortise them later, using "too short" estimates of assets lives and overestimation of bad debtors' accounts, warranty liabilities and other.

A final important point emphasised in Pope and Walker (2003) as well as Beaver and Ryan (2004) is the interaction between ex-ante and ex-post accounting conservatism. The likelihood of observing an asymmetric relation of earnings to the arrival of bad news decreases with increasing levels of ex-ante conservatism applied to investment projects in a firm. At the extreme, if a firm has already written-off the entire amount of an investment at the time the investment was made, the arrival of bad news will not be recognised in financial statements, given that there is no asset recorded in the balance sheet to which this bad news relate. Moving away from the extreme, the more un-recognised assets a firm has, the less likely it is to observe asymmetric timeliness of earnings with respect to bad news.

2.5 CONCLUDING REMARKS

Early studies in the capital market-based accounting research have established that accounting numbers convey value-relevant information to investors regarding the present value of future cash flows. Share prices tend to move in the same direction as the unexpected earnings – if they are positive, prices increase (returns are positive) and if they are negative prices decrease (returns are negative). Moreover, there is significant volatility price and trade volume in days surrounding the earnings announcements, consistent with the arrival of new information. Importantly, several studies have also shown that changes in share prices are (incrementally) associated with operating cash flow and accruals components of earnings. The economic nature of this response is determined by factors such as persistence of accounting numbers, risk, growth and general level of interest rates.

Despite strong evidence of the ability of accounting figures to influence investors' estimates of the present value of future cash flows, the empirical estimates of this response have been fount too small and only explained a small fraction of the variability in share prices. This has been ascribed to prices containing a richer information set than accounting numbers (prices-lead-earnings hypothesis), earnings containing a value-irrelevant component, deficiency of accounting measures and existence of transitory items. Conservative accounting has been identified as a possible source of transitory items in earnings (and, by extension, in other accounting measures, too).

The existence of these differences between market and accounting values created a demand for econometric model that would be able to account for these explanations. In particular, this has to the development of the "reverse" regression, whereby earnings act as a dependent, rather than an independent variable, thus forcing the errors-in-variables into the error term rather than in the coefficient. Moreover, there has been a need to control the results for scale, as the relationship has been hypothesized to be different for small and for large firms.

Defining the term of conservative accounting is also not a clear-cut problem. This chapter shows that there are two different types of conservatism: the ex-post conservatism, where economic news originate first and their effect is then reflected in accounting earnings (or, in principle, any other accounting measure), and the ex-ante conservatism, whereby a firm decides up-front on the degree of conservatism in recognising the assets in the balance sheet. The literature also indicates that any model of the link between market values and financial statements would have to account for the asymmetric treatment of good and bad news in financial statements: bad economic news are recognised more often and in large, capitalised amounts compared to good economic news, which are only recognised when they are (close to being) realised. Existing theoretical models of this asymmetric relationship are presented in the next chapter together with their extension, limits, interpretations and the main research hypotheses studied in the empirical part of this thesis.

3 THEORETICAL MODELS OF ACCOUNTING CONSERVATISM

3.1 *INTRODUCTION*

This chapter presents the main theoretical models of accounting conservatism. There are two principal ways in which the effects of ex-post accounting conservatism can be modelled. First, the effects of conservatism influence the time-series properties of various accounting figures. Therefore, by properly modelling the time-series of various accounting figures, the effect of conservative accounting can be observed. Second, the effects of conservatism on financial statements can be observed directly by using the Pope and Walker (1999) model where the original dependent variable (accounting earnings) is substituted with operating cash flow, various earnings and various accruals measures. These two models that capture the accounting conservatism are presented first in the chapter.

Because one of the effects of conservative accounting is to extend the recognition of good news over a number of accounting periods, an extended version of the Pope and Walker (1999) model covering any number of periods is presented. This generalisation, while retaining the same basic properties as the basic model, is shown separately. An alternative interpretation of Pope and Walker's (1999) theoretical model is also presented.

The decomposition of earnings into its main components is crucial in studying the effects of conservative accounting both by observing the time-series properties of these components and in using them directly as dependent variables in the Pope and Walker (1999) models of conservatism. Moreover, the effects of conservative accounting may be inferred by comparing direct tests on various accounting measures among themselves.[28]

Ex-ante conservatism represents a limit on studying the effects of ex-post conservatism. If all firms were ex-ante extremely conservative, the asymmetric timeliness of earnings and the relevant components would not be observed. Therefore, the ex-ante conservatism interacts with and represents a limiting factor in this study. Accordingly, the main conclusions of Pope and Walker's (2003) modelling of this type of accounting conservatism that affect this study is presented in a separate section.

Giner and Rees (2001) model the effects of conservative accounting originating from previous' accounting periods. At least two aspects motivate the inclusion of the their model in this study. First, they incorporate lagged earnings, which had been subjected to conservative accounting practices in previous accounting periods. This model thus represents an alternative to lagged models of conservatism and complements other results in the study. Second, the model differentiates between profit and loss firms, an issue that is explored further Chapter

[28] This would represent a similar interpretation as in Basu (1997) and Ball, Kothari and Robin (2000), where the role of accruals is inferred indirectly by comparing direct tests using the (operating) cash flow and earnings figures.

4. In combining the two motives, the difference between profit and loss firms may be due to (past) stock of conservative accounting.[29]

The chapter concludes with the formulation of hypotheses to be tested using the models of conservatism, their extension and construction of variables.

3.2 THE PERSISTENCE PROPERTY OF EARNINGS AND EARNINGS COMPONENTS

3.2.1 Persistence of generic accounting earnings

Timeliness of accounting earnings can be defined as the extent to which current period accounting earnings reflect current period value-relevant information (Beekes, Pope and Young, 2003). Under conservative (ex-post) accounting, bad economic news is recognised in accounting earnings more timely than good economic news. Increases in market value of assets (economic gains) are typically not recognised fully in the period they occur. In part, current period increases in market value are included in future periods' earnings as the underlying events that have lead to these gains are gradually realised or at least when they can be reasonably verified (Watts, 2003; Basu, 1997). This implies that the effects of gains tend to persist ("repeat" itself) in the earnings figure. At the extreme earnings permanently increase to a higher level as a result of a current period gain.

[29] The actual differentiation of profit and loss firms is not presented in this chapter, but in Chapter 4 as part of empirical analyses. The reason for this is that, theoretically, in terms of conservative accounting there should be no differences between the two groups of firms. Moreover, there are no existing models of conservatism that would allow for the differences.

On the other hand, decreases in market value (economic losses) should be recognised entirely in the period they occur, even if these decreases have not yet been actually realised. In other words, the degree of verifiability required is less for the recognition of economic losses than for the recognition of economic gains in financial statements. Losses tend to be recognised in large, complete and capitalised amounts of future expected cash flow decreases rather than gradually over time. The recognition of losses in earnings leads to a temporary decrease in earnings level and a reversal in the subsequent period of this decrease (Watts, 2003; Basu, 1997).

Econometrically, these two differential treatments of gains and losses can be modelled on a continuum defined by two limiting processes. A persistent change in a time-series of earnings levels, denoted as y_t, reflecting gains can be described by a random-walk (R-W) process.[30] A temporary change in a time-series of earnings levels y_t reflecting economic losses can be described by a first-order (AR(1)) autoregressive process. A general AR(1) process is defined as (e.g., DeFusco *et al.*, 2001, pp. 498–500; Greene, 2000, pp. 530–533; Johnston and DiNardo, 1997, pp. 207–209):[31]

$$y_t = b_0 + b_1 y_{t-1} + e_t \qquad (3\text{-}1)$$

[30] The term earnings relates to generic earnings figures and does not relate exclusively to any of the emprical alternatives used in this study nor does it exclude specifically any other performance measure.

[31] Given the method of estimation used in this study (i.e., using yearly cross-sections), this section attempts only to provide a theoretical framework for the empirical model used in several sections within Chapter 4 and does not necessarily imply a time-series estimation.

where e_t is a disturbance term with the following properties: $E[e_t]= 0$, $var(e_t)= \sigma^2$ and $cov(e_t, e_s)= 0$ for any two different time periods t and s, $t \neq s$. The series y_t itself has the following properties: $E[y_t]= b_0/(1-b_1)= \mu$, $var[y_t]= \sigma^2/(1-b^2_1)$ and $cov(y_t, y_s)= 0$ if $t \neq s$. To derive these results, the assumption that $|b_1|<1$ is necessary or the series would be explosive. The mean, variance and covariances are all time-invariant constants and the time series of y_t is weakly stationary. Such a series will tend to revert to its mean μ and fluctuations around this mean will be broadly of the same amplitude (Gujarati, p. 798). The expected mean-reversion level is $b_0/(1-b_1)$ (DeFusco *et al.*, p. 487).

At the other end of the continuum, the R-W process (generally with drift) can be viewed as a special case of the AR(1) process in (3-1) where $b_1= 1$ (Johnston and DiNardo, p. 59):

$$y_t = b_0 + y_{t-1} + e_t \tag{3-2}$$

where e_t has the same properties as the error term e in (3-1). However, the variable y_t itself now has the following properties: $E[y_t|y_0]= b_0t+y_0$ and $var(y_t|y_0)= \sigma^2 t$. The mean and variance of such a time-series is not constant through time and the variable y_t follows a non-stationary stochastic process. In time-series estimations, non-stationarity may result in a rejection of the null hypothesis of no relationship between the two variables even when they are in reality truly independent (Greene, 2000, p. 780; Finger, 1994) thus causing a severe error in inference.[32] Some other

[32] In this study, a cross-sectional, rather than a time-series, approach is generally employed to make inferences based on the results of estimated empirical verisons of these models presented below (Fama and MacBeth, 1973; Fama and French, 2000; also see bottom of section 4.2).

more advanced processes, including the exponentially-weighted moving average, are presented and used in McLeay, Kassab and Helan (1997).

In this study, first differences $\Delta y_t = y_t - y_{t-1}$ will be employed as variables rather than the levels as in several recent studies (e.g., Basu, 1997, in additional analyses). In principle, using first differences rather than levels solves the problem of non-stationarity if the original series y_t is non-stationary in time-series estimations. If the underlying series y_t follows an AR(1) process, then $corr(\Delta y_t, \Delta y_{t-1}) = -0.5$ and if it follows an R-W process $corr(\Delta y_t, \Delta y_{t-1}) = 0$ (e.g., Dechow, Kothari and Watts, 1998; Lookabill, 1976; Hagerman and Richmond, 1973; Beaver, 1970).

Generally, to distinguish between the general AR(1) process and an R-W with- drift process in changes in any variable y_t, Δy_t, the following first-differences modification of the model in equation (3-1) can be estimated:

$$\Delta y_t = \pi_1 + \varpi_1 \Delta y_{t-1} + \eta_t \tag{3-3}$$

It follows from the introduction to this section that this model likely would not be a complete description of the properties of an earnings variable. Earnings and earnings changes as well as changes in other variables are likely to be a mixture of both the AR(1) and R-W processes (e.g., Freeman, Ohlson and Penman, 1992; also see Bleaney and Mizen, 1995) because of different accounting rules that relate to the treatment of economic gains and economic losses. To allow for the asymmetric persistence in earnings-increases and earnings-decreases within the same regression model, the model must allow for both an AR(1) and a general R-W processes in changes of a variable Δy_t. The following model could be employed:

$$\Delta y_t = \pi_1 + \pi_2 C_{t-1} + \varpi_1 \Delta y_{t-1} + \varpi_2 C_{t-1} \Delta y_{t-1} + \eta_t \qquad (3\text{-}4)$$

If a time-series in Δy_t follows an R-W process then $E[\omega_1]= 0$.[33] If a time-series in Δy_t follows a mean-reverting (AR) process, then $-0.50 \leq E[\omega_1] < 0$. An indicator variable C_{t-1} is employed that serves to differentiate between positive and negative changes in earnings (y_t): C_{t-1}= {1 if $\Delta y_t \leq 0$ and 0 otherwise}. The parameter ω_2 captures the differential persistence of negative lagged changes Δy_{t-1} and the total persistence of negative lagged changes is given by the sum of the two slope coefficients ($\omega_1 + \omega_2$). Expected values of parameters π_1 and π_2 are $E[\pi_1]= E[\pi_2]= 0$ for both processes. Elgers and Lo (1994) estimate a restricted version ($\pi_2= \omega_2= 0$) of the model in (3-4) for positive and negative earnings changes separately (i.e., they estimate (3-3)). For both sub-samples, the two estimated π parameters corresponding here to π_2 and ω_2 are statistically insignificantly different from zero. Firm subscripts in (3-4) are omitted for parsimony. Also, the model in equation (3-4) can be estimated, provided the variables are properly operationalised. The operationalisation has to, at the very least, resolve econometric issues like the scale effect (see section 2.3.2).

The characterisation of the processes in accounting earnings y_t presented above are of a general nature and apply to any variable, accounting or otherwise.

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[33] If the levels model such as the model in equation (3-2) was employed, then $E[\omega_1]= 1$ (e.g., Caird and Emanuel, 1981). This also implies that the best forecast of next period's level in variable y_{t+1} is the current period's level in y_t.

This brings at least two important benefits. First, the AR(1) and R-W represent two limiting processes of a continuum (Beaver, 1970). In the former, innovations e_t in the time series have no implications for the values of y_t in future periods, while in the latter innovations fully determine the future values of the underlying series y_t. This latter property of an R-W is frequently termed the "infinite memory" of an R-W process (e.g., Gujarati, 2003, p. 799). Second, given that these characterizations can be extended to other accounting items, they can be used to form limiting expectations of the behaviour of these items. Thus, the change in an accounting item that reflects bad news is expected to be large, more earnings-reducing and more transitory than an accounting item that reflects good news gradually over time in small increments and tends to be more permanent. These predictions are used in empirical parts of this thesis.

3.2.2 Persistence of the main earnings components

On a generic and simplified level, accounting earnings (*E*) can be decomposed into (operating) accruals (*A*) and (operating) cash flows (*CF*). Given the model in (3-4) is of a very general nature, it can be employed to study time-series behaviour of these components as well. Regardless of the difficulties associated with actual definitions of these variables, some existing predictions about the values of the parameters in (3-4) are the following.

Dechow, Kothari and Watts (1998) construct a simplified accounting system starting from the assumption that sales-levels follow an R-W process as described above in (3-2). Modelling the operating cash flows, major components of working capital accruals (debtors, stock and work in process and creditors) and earnings allows them to make predictions about the time-series properties of changes in these accounting variables. At least three of their predictions serve as initial benchmarks in the empirical counterpart of this section (see section 4.4). Under certain additional assumptions, the preliminary expectations are as follows (Dechow, Kothari and Watts, 1998, Table 1, p. 143):

- $corr(\Delta A_t, \Delta A_{t-1}) = -0.500$, i.e., (working capital) accruals overall are expected to fully mean-revert within one accounting period;[34]
- $-0.500 < corr(\Delta CF_t, \Delta CF_{t-1}) < 0$ and, based on the average values of parameters of this correlation in their paper, it is predicted to be $corr(\Delta CF_t, \Delta CF_{t-1}) = -0.350$. It does not equal to –0.500 as would be expected if cash inflows were being followed directly by cash outflows and vice versa. Countering this process is the "profit-spread effect" – a portion of current-period shock to sales will be realised in cash in the current period and the rest in future period(s), which would induce positive serial correlation in successive cash flow changes – high cash inflow in the current period implies a higher-than-otherwise cash inflow in the following period;
- for completeness, they predict that $corr(\Delta E_t, \Delta E_{t-1}) = 0$, i.e., earnings overall follow a random walk process.[35]

[34] The term "working capital" is included in brackets because in Dechow, Kothari and Watts (1998) these are the only type of accruals allowed in the model.
[35] This expecation would hold under ex-post unbiased accounting.

Dechow, Kothari and Watts (1998) do not model the (time-series) behaviour of other types of accruals. In terms of operations of a firm, at least one more type of the accruals component of earnings is important. Barth, Cram and Nelson (2001), Sloan (1996) and Dechow (1994) include the depreciation and/or amortisation expense as a separate variable in their research, but do not discuss explicitly its properties. Barth, Cram and Nelson (2001) find that both depreciation and amortisation expenses are useful in predicting future cash flows. One way of interpreting the importance of the depreciation expense is that it represents a measure of the value of services the fixed assets provide in an average accounting period given the current stock of fixed assets. Therefore, if the composition of fixed assets does not change over time, the value of future fixed assets' services can be inferred from the current depreciation expense (Chambers, Jennings and Thompson II, 1999). In addition, Sloan (1996) reports that the depreciation charge is much less variable than the current asset accruals, underscoring the reliability of this measure. Furthermore, assuming a firm with no net growth in fixed tangible and intangible assets, where all investments are replacement investments financed by these funds, then the expected value of changes in depreciation and amortisation charges equal zero. One-time new net investment or disinvestment opportunities cause one-time shifts in the level of the charge. The lagged life example in Basu (1997) also means a one-time increase in the level of depreciation charge. Therefore, from both these statements, a time-series of changes in depreciation and amortisation charge is expected to follow an R-W process.

In this research, several empirical measures of the variables discussed in the above two subsections are used. Additional (empirical) expectations are formed in the empirical part as well as certain additional explanations of observed results. However, the concepts presented here serve as useful reference points to empirical results obtained later and represent part of the theoretical modelling of the concepts presented in earlier section 2.4.

3.3 THE POPE AND WALKER (1999) CONTEMPORANEOUS MODEL OF ACCOUNTING CONSERVATISM

To generate the theoretical model of accounting conservatism, Pope and Walker (1999) assume that the capital markets are informationally efficient.[36] Share prices on such markets reflect the expectations of market participants and thus of all (publicly) available information. On such markets share prices follow a random walk (R-W) process. Permanent earnings x_t in time period t are derived from the current share price p_t by reversing the discounting process that assumes constant and full (100%) payouts in every future time period: $x_t = (1/k)\cdot p_t$, where $(1/k)$ is the cost of equity capital. Hence, dividends equal permanent earnings. Alternatively, permanent earnings equal the maximum dividend that can be paid out of the firm without lowering the market value of equity (Pope and Walker, 2003).

If share prices in $x_t = (1/k)\cdot p_t$ follow a R-W process, then any linear combination of that R-W process also follows a R-W process (e.g., Ramakrishnan and Thomas, 1992). Permanent earnings x_t follow a random walk process: $x_t = x_{t-1}+e_t$. The expected value at time $t-1$ of next period's permanent earnings is

[36] The term "informationally efficient market" is distinct from an allocationally efficient market (Pareto efficient) (Campbell, Lo and MacKinlay, 1997, p. 20).

$E_{t-1}[x_t] = x_{t-1}$. Permanent earnings x_t in time period t would equal permanent earnings at time $t-1$, except for the random shock e_t to permanent earnings during the time period from $t-1$ to t. The random shock represents the effects of (or, is a consequence of) the arrival of economic news on the market. Economic news is information that affects the present value of future expected cash flows: the size of future expected cash flows and/or the distribution of these cash flows in time and/or the riskiness of these cash flows.[37] By definition of news, $E[e_t]= 0$. If the shock to permanent earnings is positive, then the economic news is assumed to be good, i.e., the expected size of future cash flows has increased and/or the cash flows are expected to occur earlier and/or the riskiness of these cash flows has decreased. If the shock to permanent earnings is negative, the economic news is assumed to be bad, i.e., the expected size of future cash flows has decreased and/or the cash flows are expected to occur later in time and/or the riskiness of these cash flows has increased.

Reported earnings X_t are assumed to differ from permanent earnings x_t due to two and only two factors:

1. the effects of conservative accounting in the current period t, allowing for differences in good news ($e_t>0$ or $e_t^+ = \max[0, e_t]$) and bad news ($e_t \leq 0$ or $e_t^- = \min[e_t, 0]$);
2. the cumulative effects of past conservative accounting $V_t = V_t(e_{t-\tau}^+, e_{t-\tau}^-; \forall \tau = 1,\ldots,H)$, where H denotes the maximum length of lagged

[37] This assumes that the risk adjustment is passed into the relation via the required rate of return in the denominator. Feltham and Ohlson (1999) adjust the expected cash flows for risk (i.e., they adjust the nominator) and discount these adjusted cash flows at the risk-free rate of return.

time period from which economic news still flows through to current period's earnings (financial statements).

The reported or accounting earnings can thus be defined as in the following equation:

$$X_t = x_t + \left[-\theta_0 e_t^+ + \gamma_0 e_t^-\right] + V_t \tag{3-5}$$

where the parameter θ_0 captures the under-recognition of contemporaneous good news in current period t and parameter γ_0 captures the over-recognition of contemporaneous bad news in current period t. k is the earnings multiple and $(1/k)$ is the cost of equity capital. In this model, there are no other deviations of reported earnings from permanent earnings.

In a neutral (unbiased) and perfectly timely accounting system (GAAP regime), a random shock in the current period that caused permanent earnings to depart from previous period's permanent earnings x_{t-1} would be fully impounded into current reported earnings X_t. Assuming the accounting regime has not changed at any point in time the firm was operating, the term that captures the cumulative effect of past conservative accounting would also be $V_t = 0$. Reported earnings would then equal permanent earnings $X_t = x_t$ at any time period t. If an accounting system is conservative, however, then a positive shock to permanent earnings is not fully incorporated in current reported earnings – i.e., reported earnings are lower than permanent earnings. Accounting rules prevent the incorporation of these shocks until they are realised. Permanent earnings must thus be reduced by the part of the random shock, $-\theta_0 e_t^+$, that does not yet meet the criteria for recognition. The part that is recognised in current reported earnings equals $(1-\theta_0)e_t^+$. Negative shocks to permanent earnings in a conservative accounting system should be at least fully ($\gamma_0 = 0$) and possibly over-recognised ($\gamma_0 > 0$) in current period reported earnings. Generally, a negative random shock is incorporated in current period earnings with a multiple $(1+\gamma_0) \geq 1$. Previous period permanent earnings x_{t-1} are reduced by a multiple of the contemporaneous random shock $(1+\gamma_0)e_t^- \leq 0$ to arrive at the current period reported earnings X_t. Current period reported earnings are lower than or (at most) equal to permanent earnings in the same period $X_t \leq x_t$.

The term V_t captures cumulatively the yet-unrecognised proportions of past positive random shocks to permanent earnings $e_{t-\tau}^+;\forall\tau = 1...H$ and possible reversals of over-recognised proportions of past negative random shocks to permanent earnings $e_{t-\tau}^-;\forall\tau = 1...H$. Pope and Walker (1999) assume, reasonably, that $cov(e_j,e_i)=0\ \forall i,j = 0...H$. By definition, the shocks (news) e_t in every time period is random and as such uncorrelated across different time periods, earlier or later. If the assumption $cov(e_j,e_i)= 0\ \forall i,j$ did not hold, past values of shocks could be used to predict current shocks and thus partially the values of earnings x_t (Beaver, 1970). In other words, part of the current-period change in permanent earnings would not be due to current-period news.

To arrive at an empirical version of the model, equation (3-5) is deflated by lagged market price p_{t-1}:

$$\frac{X_t}{p_{t-1}} = \frac{x_t}{p_{t-1}} + \left[-\frac{\theta_0 \cdot e_t^+}{p_{t-1}} + \frac{\gamma_0 \cdot e_t^-}{p_{t-1}} \right] + \frac{V_t}{p_{t-1}} \tag{3-6}$$

Defining $R_t = (p - p_{t-1})/p_{t-1}$, noting that the definition of permanent earnings and the random walk assumption about permanent earnings imply the following relation (shown in deflated form):

$$\frac{e_t}{p_{t-1}} = \frac{1}{k} \cdot \left(\frac{p_t}{p_{t-1}} - 1 \right) \tag{3-7}$$

and expanding equation (3-6) yields:

$$\frac{X_t}{p_{t-1}} = \frac{1}{k} + \frac{1}{k}\left(-\theta_0 \cdot \max[0, R_t] + \gamma_0 \cdot \min[R_t, 0] + R_t\right) + \frac{V_t}{p_{t-1}} \tag{3-8}$$

The model in equation (3-8) can be empirically estimated via a dummy variable D_t defined as D_t= {1 if $R_t \leq 0$ and 0 otherwise} that allows the asymmetric response of contemporaneous reported earnings to good and bad news:

$$\frac{X_t}{P_{t-1}} = \frac{1}{k} + \frac{1-\theta_0}{k} \cdot R_t + \frac{\gamma_0 + \theta_0}{k} \cdot R_t D_t + \frac{V_t}{P_{t-1}} \tag{3-9}$$

Simplifying the annotation, (3-9) reduces to the following model:

$$\frac{X_t}{P_{t-1}} = \alpha_1 + \alpha_2 D_t + \beta_1 R_t + \gamma_1 R_t D_t + \varepsilon_t \tag{3-10}$$

The coefficient $\beta_1 = (1-\theta_0)/k$ captures the proportion of current-period good economic news captured by current-period accounting earnings X_t. Under conservative accounting that delays the recognition of good news, this coefficient is expected to be less than the cost of equity capital $(1-\theta_0)/k < (1/k)$. The incremental coefficient $\gamma_1 = (\gamma_0+\theta_0)/k$ captures the incremental proportion of current-period bad economic news captured by current period accounting earnings. Under conservative accounting, the incremental γ_1 coefficient is expected to be greater than 0. The magnitude of the incremental γ_1 coefficient represents a primary indicator of asymmetric timeliness in deflated earnings (X_t/P_{t-1}) and thus of ex-post accounting conservatism.

The term V_t/p_{t-1} is a function of past shocks to permanent earnings, themselves by definition random. Therefore, it is unlikely that they will be correlated with current period's news ε_t effect on current earnings. The term is assumed to be a part of the regression constant α_0 in any regression analysis employing equation (3-9). The coefficient α_1 is expected not to differ significantly from zero.

The model in equation (3-10) can be, in principle, empirically estimated, as soon as the returns R_t and the indicator D_t variables are operationalised. There are several ways in which this operationalisation can be done. A detailed explanation of the method used in this thesis is presented below in section 4.2. Regarding the form of the model and the form of the independent variable, note that the model is a levels-model (Kothari and Zimmerman, 1995) and several studies conclude that the appropriate deflator is the lagged market value (e.g. Christie, 1987, Easton, 1999 and others). In the models used in this study and regardless of the definition of R_t (i.e., cum- or ex-dividend), lagged market value (P_{t-1}) appears in the models as a deflator and thus mitigates the scale problem.

For completeness of the presentation of the Pope and Walker (1999) contemporaneous model, note that an aggressive accounting system might also be characterised by an immediate and full recognition or even over-recognition of current period good news in accounting earnings such that $(1-\theta_0)/k$ exceeds the cost of equity $(1-\theta_0)/k \geq (1/k)$ and/or under-recognition of contemporaneous bad news such that $(1+\gamma_0)/k < (1/k)$. The properties of aggressive or liberal accounting are discussed briefly in Penman (2001, pp. 561-562) and, for example, as early as in Bernstein and Siegel (1979), but the empirical research is scarce in this area. The issue is not explored further theoretically or empirically in this study.

3.4 LAGGED MODEL OF ACCOUNTING CONSERVATISM

There are at least two reasons that motivate the development of the lagged version of the Pope and Walker (1999) model of accounting conservatism in equations (3-8) and (3-9) above. First, extending the model with lagged news can be used to study the speed with which previous periods' economic news flow through to reported earnings (or any other accounting variable that may serve as a proxy for permanent earnings). Second, Pope and Walker (1999) assume in the derivation of the contemporaneous model that $\text{cov}(e_j,e_i)= 0\ \forall i,j = 0 \ldots H$, i.e., they assume that news is uncorrelated across past, present or future time periods. This assumption is reasonable, since news from different time periods cannot be correlated across time by definition. However, extending the contemporaneous model by incorporating the current period accounting effects of economic news originating from previous periods might help to control for any effects that might arise should, for any reason, the correlations $\text{cov}(e_j,e_i) = 0 \; \forall i,j = 0 \ldots H$ not all be equal to zero at any point in time. If this were the case, the correlated omitted variable problem in (3-8) would arise, attenuating the coefficients on all variables included in the model.

The theoretical model in equation (3-6) can be expanded by any number H of time periods for which it is reasonable to expect that economic news originating from those periods will affect the contemporaneous reported earnings. The time period therefore spans the interval $(t, t-H)$ as follows:

$$X_t = x_{t-H} - \sum_{\tau=0}^{H-1}(1-\theta_\tau)\cdot e^{+}_{t-\tau} + \sum_{\tau=0}^{H-1}(1+\gamma_\tau)\cdot e^{-}_{t-\tau} + V_t \tag{3-11}$$

Defining further a series of price-relative variables $Q_{t-\tau,\,t-\tau-1} = (p_{t-\tau} - p_{t-\tau-1})/p_{t-H}$ where $\tau = 0,\ldots,(H-1)$, that separate good and bad news in different time periods, and then substituting these definitions into (3-11), expanding and rearranging yields the following lagged model:

$$\begin{aligned} \frac{X_t}{p_{t-H}} &= \frac{1}{k} + \\ &+ \frac{1}{k}\left(\sum_{\tau=0}^{H-1}\left(-\theta_\tau \cdot \max\left[0, Q_{t-\tau,t-\tau-1}\right]\right) + \sum_{\tau=0}^{H-1}\left(\gamma_\tau \cdot \min\left[Q_{t-\tau,t-\tau-1}, 0\right]\right) + \sum_{\tau=0}^{H-1} Q_{t-\tau,t-\tau-1}\right) + \\ &+ \frac{V_t}{p_{t-H}} \end{aligned} \tag{3-12}$$

Empirically, the model in equation (3-12) can be estimated via a set of dummy variables $D_{t-\tau,t-\tau-1}$ defined as $D_{t-\tau,t-\tau-1}$= {1 if $(p_{t-\tau}-p_{t-\tau-1})\leq 0$ and 0 otherwise} that allow for the asymmetric recognition of good and bad news in each time period $(t-\tau,\ t-\tau-1)$ where $\tau=0,\ldots,(H-1)$:

$$\frac{X_t}{p_{t-H}}=\frac{1}{k}+\sum_{\tau=0}^{H-1}\frac{1-\theta_\tau}{k}\cdot Q_{t-\tau,t-\tau-1}+\sum_{\tau=0}^{H-1}\frac{\gamma_\tau-\theta_\tau}{k}\cdot Q_{t-\tau,t-\tau-1}\cdot D_{t-\tau,t-\tau-1}+\frac{V_t}{P_{t-H}} \tag{3-13}$$

The coefficients $(1-\theta_\tau)/k$ show the proportion of period $(t-\tau,\ t-\tau-1)$ good economic news captured by current period accounting earnings X_t. Under conservative accounting, these coefficients are expected to be less than the cost of equity capital $(1-\theta_\tau)/k<(1/k)$. The effect of good economic news from periods farther back in time is more likely to be already captured by accounting earnings. Therefore, the coefficients $(1-\theta_\tau)/k$ are expected to monotonically increase until the full effect recognised by the capital market in the past is incorporated in accounting earnings. Under the assumptions of the Pope and Walker (1999) model, this implies that the total good news coefficients have to approach the cost of equity capital $1/k$ as the lag is increased further back in time. The total coefficients $(1+\gamma_\tau)/k$ capture the multiples of $(t-\tau,\ t-\tau-1)$ period bad economic news captured by current period accounting earnings. Under conservative accounting, only the first coefficient $(1+\gamma_0)/k$ is expected to be greater than or equal to the cost of equity $(1+\gamma_0)/k\geq(1/k)$. The conservatism property of accounting earnings implies that bad economic news should have been immediately incorporated in accounting earnings in the period it has occurred. There should not be any incremental relation between current accounting earnings and past economic news and the incremental coefficients should all equal zero as a consequence of the fact that everything the market has anticipated should already have been incorporated in accounting earnings as well.

Assuming prices lead earnings by up to three periods (e.g., Donnelly and Walker, 1995), allowing a further lag so that $H=4$ and simplifying the annotation in (3-13), the model reduces to:

$$\frac{X_t}{P_{t-4}} = \alpha_1 + \alpha_2 D_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \beta_{\tau+1} Q_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \gamma_{\tau+1} Q_{t-\tau,t-\tau-1} D_{t-\tau,t-\tau-1} + e_t \qquad (3\text{-}14)$$

In the case of reported accounting earnings, the coefficients on good news are expected to increase monotonically towards the cost of equity capital $\beta_1<\beta_2<\beta_3<\beta_4\leq(1/k)$, the incremental coefficient on current period bad news γ_1 is expected to be greater than 0, and the lagged coefficients on bad news are all expected to equal zero $\gamma_2=\gamma_3=\gamma_4=0$, given that under conservative accounting bad news is expected to be impounded immediately in accounting earnings. The term V_t/p_{t-4} is a function of past shocks to permanent earnings resulting from periods prior to (t–3, t–4). It is unlikely that they will be correlated with current period's news ε_t effect on current earnings. The term is assumed to be a part of the regression constant α_1. The coefficient α_2 is expected not to differ significantly from zero – if equations (3-13) and (3-14) are compared, it can be seen that the term does not follow from the theoretical derivations, but is included in practice to avoid potential correlated omitted variables problem and the resulting biases. As with the contemporaneous versions, the model in equation (3-14) could be, in principle, empirically estimated, provided returns $Q_{t-\tau,t-\tau-1}$ and the dummy variables $D_{t-\tau,t-\tau-1}$ are operationalised.

3.5 BALL, KOTHARI AND ROBIN (2000) INTERPRETATION OF BASU (1997)

Ball, Kothari and Robin (2000, 2000b) note three contemporaneous properties of accounting earnings. First, the recognition principle causes economic income to be incorporated in accounting earnings with a lag, generally close to the point when actual cash flows are realised. This property implies that accounting earnings are a weighted average of past economic earnings. The second property is that accruals are constructed so that they remove the negative serial correlation in operating cash flows, i.e., they smooth the time-series of operating cash flows through time. Third, while the recognition principle generally causes economic gains to be incorporated in accounting earnings at points close to cash flow realisations, expectations about lower future cash flows lead to some economic income to be incorporated in accounting earnings immediately rather than when these (lower) cash flows are realised. This is a consequence of the conservatism property of accounting earnings.

Based on these properties, they define accounting earnings X_{it} of firm i in period t as a function of current period economic income ΔV_{it} and a "disturbance" term η_{it}:

$$X_{it} = g(\Delta V_{it}, \eta_{it}) \qquad (3\text{-}15)$$

The difference (the "disturbance) $\eta_{it} = \Delta V_{it-1}, \Delta V_{it-2}, \Delta V_{it-3}, ..., a_{it}$ between current period accounting earnings and current period economic earnings is due, first, to the effects of the recognition principle being applied on previous periods' economic earnings ΔV_{it-1}, ΔV_{it-2}, ..., and, as in Pope and Walker (1999), $cov(\Delta V_{it-n}, \Delta V_{it-m})= 0$ for all $m \neq n$ and $m, n > 1$. Rules regarding the recognition prevent the full amount of economic income being immediately incorporated in accounting earnings. The second part of the difference between accounting and economic earnings is due to imperfect removal of negative serial correlation from the time-series of operating cash flows, a_{it}.

Empirically, the measure of economic income employed by Ball, Kothari and Robin (2000) follows the Hicksian theoretical definition of economic income.[38] Economic income is defined as the cum-dividend fiscal-year return, adjusted for capital splits and capital contributions. By allowing for the difference between positive and negative returns (economic income) via a dummy variable, they incorporate the third contemporaneous property of accounting earnings – the accounting conservatism in their model. This yields the same empirical model as in Pope and Walker (1999), shown in equation (3-10) in section 3.3 above. Although Ball, Kothari and Robin (2000) do not provide explicitly a theoretical structure of these coefficients, the empirical interpretation of the expected values of the coefficients is the same as in Pope and Walker (1999) model.

[38] An early discussion regarding different concepts of income in accounting is Bangs (1940).

There are at least two other important points to note. First, Ball, Kothari and Robin (2000) view operating cash flows as an alternative measure of firm performance. This measure is less timely and noisier than accounting earnings itself. It is less timely because operating cash flows do not anticipate (contain, incorporate) any cash flows before they occur. The anticipation of some of the cash flows is a feature of accounting earnings attributable to accruals. Operating cash flow is a noisier measure of performance because, absent any accruals, the disturbance term η_{it} in equation (3-15) above would be relatively high due to the component a_{it}. This component is higher when less negative serial correlation is being removed from the performance number (e.g., the operating cash flow). The view that operating cash flows are a less timely and noisier measure of performance is consistent with studies as early as Ball and Brown (1968) who re-estimate their basic set of results using an approximation of the operating cash flow figure and conclude that this measure is not as successful as the (bottom-line) net income in predicting the signs of unexpected returns. Beaver and Dukes (1972) is an example of an early study that finds the cash flow figure to be less associated with returns than earnings. Finger (1994, p. 210) also takes a consistent view that operating cash flows and earnings represent two "future benefits of equity investment", i.e., that both figures represent a measure of (future) performance.

These observations are important to the research in this thesis in that to study the impact of accounting conservatism on the relationship between permanent earnings and accounting earnings, different proxies for permanent earnings may be employed. Basu (1997) has in fact used this approach to indirectly observe the effects of conservatism on the link between market values and financial statements by comparing the coefficients resulting from the estimation of different earnings and operating cash flows regressions. The difference is ascribed to the accruals component of earnings.

Second, given the structure of the disturbance term η_{it} in equation (3-15) above, the model explicitly shows the underlying logic of incorporating lagged periods' economic news to determine current period accounting earnings – that is to model the effects of recognition rules applied in previous accounting periods.

3.6 THE EFFECT OF ASSET RECOGNITION RULES

As presented in section 2.4 above, the effects of asset recognition rules on the link between financial statements and market values is the subject of several papers, among them in Pope and Walker (2003), Watts (2003), Zhang (2000), Beaver and Ryan (2000), Hayn and Givoly (2000), Ahmed, Morton and Schaefer (2000) Myers (1999), Dechow, Hutton and Sloan (1999), Feltham and Ohlson (1995, 1996). In variants, these papers define a firm to be ex-ante conservative if the applied accounting depreciation rate is higher than the economic rate of depreciation. This results in market value of shareholders' equity being on average higher than the book value of equity. Therefore, one possible measure of the level of ex-ante conservatism is the book-to-market ratio.

Pope and Walker (2003) provide a framework using a downward revaluation charge in which they relate this ex-ante form of conservatism with the ex-post conservatism. In their *Proposition* 1 they state that:

> "Given the assumptions of the Feltham and Ohlson (1996) model, and assuming all the parameters except δ are constant, the difference between market value and book value is strictly negatively related to the accounting parameter δ." (p. 6)

The level of ex-ante conservatism is determined by the accounting policy parameter δ such that $(1-\delta)$ is the accounting rate of depreciation. The higher the accounting rate of depreciation, the higher the proportion of the initial investment that is treated as an expense instead of being capitalised as an asset, and the lower is the probability that the book value will exceed market value. Typically, this would, in turn, trigger a downward revaluation charge in the full, capitalised amount through income. These requirements are part of national and international standards. For example, FRS 11 – *Impairment of Fixed Assets and Goodwill* deals with this issue in the UK and generally the International accounting standard IAS 36 – *Impairment of assets* (European Commission, 2003).

Typically, the converse will not apply – if market value exceeds book value the difference will increase reserves and will not be treated as income until realised.[39] Therefore, the probability of observing an asymmetric relation between accounting income and market values decreases with the depreciation rate $(1-\delta)$ (Pope and Walker, 2003). In other words, the more ex-ante conservative the firm is,

[39] Some of the different issues regarding the revaluation of fixed assets are presented in Easton, Eddey and Harris (1993); Ghicas, Hevas and Papadaki (1996); Barth and Clinch (1998), Cotter (1999), Lin and Peasnell (2000) among others.

the smaller the probability of observing an asymmetric relationship between earnings and returns.

In this research, the intuition presented above is further extended. First, accounting earnings are decomposed into its operating cash flows and accruals components. The book-to-market ratio should reflect the on-average ex-ante conservative accounting policy for all operating assets. However, the ex-ante conservative policy might be applied differently to different classes of assets such that there would be a class of accounting depreciation $(1-\delta)$ parameters, one for each different type of operating assets, based on differential expectations about future cash flows resulting from investments in these assets. Therefore, the many different downward revaluation charges (irrespective of their actual accounting form) are correlated to the type of asset they originate from: the more ex-ante conservative the firm is regarding a particular asset, the smaller the amount of this particular asset on the balance sheet and the smaller the probability of observing an asymmetric relationship between the accruals originating from this particular asset and returns. The term "accruals" is used here explicitly to stress that downward asset revaluations relate only to the accruals component of earnings. Any such revaluation is due in large part to accounting rules, not to realised cash flows, so it must be reflected in earnings via accruals.

3.7 THE DECOMPOSITION OF EARNINGS

In this study, current period accounting earnings X_t is decomposed in a number of different accounting flow variables. Conceptually, and also by the way it is constructed, it is possible to divide accounting earnings in its two main constituent parts: (operating) cash flows and accruals.[40] The relative scarceness of clear guidelines, either theoretical or empirical, as to the precise way of this decomposition, following conceptual decomposition is proposed:

EARNINGS = CASH FLOWS + ACCRUALS

= OPERATING CASH FLOWS + WORKING CAPITAL ACCRUALS +

+ DEPRECIATION AND AMORTISATION + SPECIAL ITEMS +

+ (OTHER CASH FLOWS + OTHER ACCRUALS)

The motivation to decompose accounting earnings into its main components stems from at least three sources. First, accounting conservatism is an accruals, rather than a purely earnings or even a cash flow phenomenon. Accruals are essentially all adjustments to operating cash flows to arrive at the earnings figure (Barth, Cram and Nelson, 2001). Therefore, the effects of accounting conservatism should be most apparent in analyses where accounting measures containing more accruals are used as dependent variables, whether different types of earnings or otherwise. This compares with measures containing little or no accruals (e.g., operating cash flows). Basu (1997) and Ball, Kothari and Robin (2000) employ both operating cash flow and earnings variables to analyse the effects of conservatism. By

[40] The term "earnings component" is used in this study to denote any component of earnings: cash flows, accruals or any particular form of accruals (e.g., depreciation expense, change in stock and work in process, etc.).

comparing the regression coefficients and adjusted R^2s from, for example, pairs of regressions using either cash flows or earnings as dependent variables, inferences are drawn about the role of different earnings components – accruals in particular – in reflecting economic news. Similarly, Pope and Walker (1999) employ two different measures of earnings containing different "amounts" of accruals to infer the properties of the accruals components. The idea of comparing the relative roles of various performance measures containing different levels of accruals has been employed already as early as in Ball and Brown (1968). They used bottom-line net income as the main variable, but also re-estimated their basic results using two additional performance measures containing less accruals (net income before non-recurring items and operating cash flow approximated by operating income). Garrod, Giner and Larran (2003) disaggregate earnings into cash flows and several (detailed) accruals components and study the value-relevance of these items. McLeay, Kassab and Helan (1997) disaggregate cash flow into earnings, current accruals and non-current accruals (the latter represents a counterpart to "other accruals" in the above decomposition).

Second, separating regressions with earnings and operating cash flows as dependent variables should help to distinguish between factors that can be attributed to changes in the accounting regime (i.e., the accruals component of earnings) and factors that reflect changes in the economic situation of the firm (i.e., the cash flow component of earnings) (Ryan and Zarowin, 2003).

Third, the properties of these groups of accounting numbers within the conservatism framework are not thoroughly researched, either theoretically or empirically. For example, as noted in section 3.2.2, the accounting literature does generally not deal in detail empirically with the time-series behaviour of accounting depreciation charge so these properties must be inferred directly from accounting standards or assumed properties – the depreciation charge represents a reversal of a positive accrual in the period when an asset is acquired and recorded on the balance sheet; in this period, net income will on average exceed (net) cash flows (Ahmed *et al.*, 2002). Existing literature suggests that the components of earnings presented in the conceptual decomposition above may have different properties. For example, in the context of this study, Basu (1997) predicts and finds current-period operating cash flows are weakly correlated with both good and bad news, while earnings are strongly correlated with bad news and weakly correlated with good news. Dechow, Kothari and Watts (1998) model theoretically the time-series behaviour of different components and show that these components are indeed expected to exhibit different time-series properties at the theoretical level.

This conceptual decomposition is followed in the main empirical analysis in this study in some cases by several empirical counterparts of these groups of variables, such as different measures of earnings and cash flows. In part, this represents an attempt to capture fully any additional insights that might arise due to the discrepancy between the conceptual decomposition and the empirical measures that attempt to follow it.[41] At the same time such an approach also ensures a high degree of comparability with the existing literature. Moreover, in the Appendices, some of these empirical measures are extended even further to gain additional insight or to enhance comparability with existing literature.

[41] Empirical measures of these "conceptual" variables are described in detail in section 4.2 below.

3.8 PERSISTENCE WITHIN THE GINER AND REES (2001) MODEL OF THE V_T TERM

Giner and Rees (2001) extend the contemporaneous Pope and Walker (1999) model of accounting conservatism with regression terms that capture the persistence of the dependent variable (reported accounting earnings in their case). In the empirical version of the contemporaneous model presented in equation (3-10), they introduce, empirically, additional regression terms that control for the persistence of the dependent variable (earnings in their case) so that the resulting model is the following extension of Pope and Walker (1999):

$$\frac{X_t}{P_{t-1}} = \alpha_1 + \alpha_2 D + \beta_1 R_t + \gamma_1 R_t D_t + \delta_1 L_{t-1} + \delta_2 \frac{X_{t-1}}{P_{t-1}} + \delta_3 L_{t-1} \frac{X_{t-1}}{P_{t-1}} + \varepsilon_t \tag{3-16}$$

where X_t is the generic reported accounting earnings for the accounting period t, L_{t-1} is a dummy variable defined as L_{t-1}= {1 if $X_{t-1} \leq 0$ and 0 otherwise}. The regression coefficient δ_2 captures the reversal of deviations from above the normal earnings-to-price ratio and δ_3 captures the incremental/differential reversal of deviations from below the normal earnings-to-price ratio. These two controls represent an attempt to model the effects of previous' periods conservative accounting on current reported earnings, which is captured by the V_t/P_{t-1} term in equation (3-9) above. It is worth noting that the deviation of reported earnings X_t from permanent earnings x_t within the Pope and Walker (1999) model is allowed to originate from two sources only: a) current conservative accounting (captured in parameters β_1 and γ_1 in the equation (3-10) above) and b) past accounting conservative practices (captured in the regression constant α_1 together with the cost of capital and any other on-average effects not captured by the independent variables in equation (3-16)). Because Giner and Rees's (2001) model includes lag-one earnings X_{t-1} that was also subject to effects of conservative accounting in previous periods (in this case up to lag one relative to the current period), the regression constant in α_1 should be cleaned of this effect and is thus expected to be lower than in the basic contemporaneous model in (3-10). Therefore, as Giner and Rees (2001) note, their extension should represent an alternative modelling of the V_t/P_{t-1} term that captures the effects of past conservative accounting on current reported earnings. This is because the terms δ_1, δ_2 and δ_3 capture the deviation from the average earnings-to-price ratio in the previous accounting period (t–1, t–2). The separation by the sign of earnings proxies for whether the term is more likely to reflect past economic gains (and thus persist) or past economic losses (and thus reverse fast to the norm). The other method of modelling the V_t/P_{t-1} term is by introducing previous' periods news into the contemporaneous models (Giner and Rees, 2001), as presented above in section 3.4.

Their study is extended in two ways. First, earnings are decomposed into its operating cash flow and various accruals components as presented above in section 3.7. Second, the generic earnings are substituted empirically with three different empirical earnings measures as presented in section 4.2.

However, unlike in the Giner and Rees (2001) paper, there are now at least two different possibilities regarding the definition of the L_{t-1} dummy variable as well as the definition of the persistence variables X_{t-1} on the right hand side of equation (3-16):[42]

- L_{t-1} takes the value of 1 if reported accounting earnings X_{t-1} are negative. The indicator variable L_{t-1} is thus independent of the actual accounting variable used as the dependent variable X_t in the model in equation (3-16). This definition of the indicator variable appears to be more consistent with Pope and Walker (1999) and Giner and Rees (2001) and with other existing literature in that positive earnings are generally more likely to reflect persistent economic gains, while negative earnings are more likely to reflect economic losses. This definition would also be in line with one of the proxy indicators of good and bad news in section 4.4 that studies the persistence property of various accounting items where one of the indicator variables is the sign of bottom-line earnings in all models regardless of which accounting variable is used as the dependent variable in the model. In this variant, the independent variable X_{t-1} associated with terms δ_2 and δ_3 would thus be the same earnings variable used to define the L_{t-1} indicator (i.e., earnings);

- L_{t-1} takes the value of 1 if the lagged values X_{t-1} of the actual accounting variables used as the dependent variables X_t in models of conservative accounting are negative (the variable X can, conceptually, be earnings or operating cash flows or any of the accruals). According to the conceptual division of earnings into its two main components (operating cash flows and accruals) and the sign

[42] Given the other models employed in this thesis, there are in fact several possibilites, most obvious by positive/negative operating cash flows or by positive/negative types of accruals, apart from those presented here.

convention employed in this study, a negative variable X_{t-1} indicates an earnings-decreasing value. It is thus more likely to reflect an economic loss than an economic gain and, accordingly, revert faster to the norm. This definition of the indicator variable is also consistent (although not equivalent to) with sections studying the persistence property of various accounting items, where one of the indicator variables for bad news is defined in terms of the earnings-decreasing changes of various accounting items rather than earnings as a composite figure (issues regarding differences in empirical estimations due to different deflators are assumed away in this theoretical section). In this variant, the independent variable X_{t-1} associated with terms δ_2 and δ_3 would thus be the same accounting variable used to define the L_{t-1} indicator as well as the variable used as the dependent variable X_t.

Both variations are interesting within the context of this study. The first variation allows differentiating between the asymmetric incorporation of good and bad news into various current accounting measures conditional on whether the firm shows a (lagged) bottom-line profit or a loss. Earnings of firms showing a profit are more likely to reflect economic gains, while earnings of firms showing a loss are more likely to reflect (current) economic losses. The second variant allows studying the incorporation of good and bad news into various earnings components given the (lagged) sign of these components and thus their direct role in forming current reported earnings, either by increasing it or by decreasing it.[43] As generally with earnings, earnings-increasing changes in earnings components are more likely to reflect economic gains than economic losses. This second variant might also be

[43] There are some accounting items that by definition cannot be conditioned on their sign in this manner – sales and depreciation expense, for example, represent two such items.

viewed as a refinement of the first variant in that it allows for the role of specific earnings components that revert the departure from the normal earnings-to-price ratio back to the norm (rather than the "all-inclusive" earnings figure). Moreover, such a division allows a comparison of empirical results with the results on time-series properties of different accounting variables. Because of these two complementary views of the Giner and Rees (2001) model, both variants will be explored in the empirical part of this thesis. Moreover, both variants tie in with the distinction between profit and loss firms made in section 4.8 below.

3.9 HYPOTHESES FORMULATION

In this thesis several hypotheses based on the above theoretical models/constructs are formed and empirically tested using different methods, whether unconditional or conditional on certain cross-sectional properties of the firms studied. Whilst some of these hypotheses have been the subject of earlier studies, they are reproduced here as such earlier studies have not been undertaken using UK data, extending over such a long time series and/or with the supporting sensitivity analyses that are reported below in a separate chapter. The main hypotheses are summarised below in alternative forms.

The order in which the hypotheses are presented, is the following. Hypotheses are grouped by the four main research issues: the persistence property, direct tests based on Pope and Walker (1999), separation of profit and loss firms and, finally, the effects of asset-recognition rules. Within these groups, sub-divisions relate to the operating cash flow component of earnings, earnings themselves and, finally, the accruals component. The order of these sub-divisions follows stems from the expectation that accounting conservatism is not reflected in the operating cash flow figure, but that it is reflected in the earnings figures and the specific component that reflects conservatism is the accruals component. Therefore, the order serves to highlight the relative roles of the cash flow and accruals components. Because the accruals component is a collection of potentially very different types of accruals, the accruals component is further sub-divided, where necessary. Finally, because conservatism is defined above in terms of asymmetric timeliness of accounting performance measures in respect to good and bad economic news, different expectations about the reflection of good and bad are made.

The time-series behaviour of earnings, operating cash flows and accruals (and its components) is studied first. Under conservative accounting, earnings-increasing changes (a consequence of gains) in accounting variables that are affected by conservatism are expected to persist, while earnings-decreasing changes (a consequence of losses – decreases in market value) are expected to mean-revert. Stated in alternative form, the persistence hypothesis H_1, broken down by operating cash flows, earnings and accruals subsections, is:

$H^A_{1,a}$: *i. Operating cash flows mean-revert.*

ii. There is no asymmetric persistence between earnings-increasing and earnings-decreasing operating cash flow changes.

$H^A_{1,b}$: *i. Earnings-increases are permanent.*

ii. Earnings-decreases are transitory.

iii. The higher the content of accruals, the greater the asymmetric persistence exhibited between earnings-increases and earnings-decreases.

$H^{A}_{1,c}$: *i. Accruals, overall, mean-revert.*

ii. The rate of mean-reversion is smaller for earnings-increasing accruals than for earnings-decreasing accruals.

Different types of accruals exhibit differential time-series behaviour:

iii. Working capital accruals mean-revert.

iv. The rate of reversal is higher for earnings-decreasing changes.

v. Depreciation and amortisation charge is persistent.

vi. There is no asymmetry between earnings-increasing and earnings-decreasing changes in the depreciation charge.

vii. Special items mean-revert.

viii. The rate of reversal is higher for earnings-decreasing changes.

The expectations regarding hypotheses $H^{0}_{1,a}$ *i.* to $H^{0}_{1,c}$ *viii.* are that they will be rejected in favour of the alternative hypotheses stated above. These expectations are all expected to be observed empirically under conservative accounting. Note that the operating cash flows do not, theoretically, contain any accruals and, therefore, cannot be affected by accounting conservatism. In existing literature, the time-series properties of operating cash flow, earnings and accruals have been explored with varying degrees of detail, but there is no comparable UK literature. Moreover, the time-series properties of the depreciation charge have not been explored, and, if only because the definition is new, neither have the properties of special items in the UK context. Varying time-series properties of earnings with different levels of accruals (and some other components) have also not been explored empirically.

Next, regarding direct tests of ex-post accounting conservatism based Pope and Walker's (1999) tests of asymmetric timeliness of accounting earnings and its operating cash flows and accruals components, the direct-test hypothesis is formed, with four subsections. Stated in alternative form, the hypothesis H_2 is:

$H^A_{2,a}$: *Operating cash flows reflect contemporaneous good and bad economic news symmetrically.*

$H^A_{2,b}$: *i. Earnings reflect contemporaneous good and bad economic news asymmetrically.*

ii. The incorporation of bad news is more timely than the incorporation of good news.

iii. The higher the level of accruals in earnings, the higher the asymmetric timeliness of earnings in incorporating bad news.

$H^A_{2,c}$: *i. Accruals, overall, reflect contemporaneous good and bad economic news asymmetrically.*

ii. The incorporation of bad news is more timely than the incorporation of good news.

Different types of accruals exhibit different properties regarding the asymmetric recognition of good and bad news:

iii. Working capital accruals are more timely in reflecting bad news.

iv. Depreciation and amortisation charge exhibit no asymmetric timeliness in incorporating bad news.

v. Special items are more timely in reflecting bad news.

$H^{A}_{2,d}$: *As a time-series result, ex-post conservatism is increasing through time.*

The expectations regarding hypotheses $H^{0}_{2,a}$ *i.* to $H^{0}_{2,c}$ *v.* are that they will be rejected in favour of alternative hypotheses stated above. The expectations resulting from the above hypotheses should all be observed under conservative accounting. Note that the operating cash flows does not, theoretically, contain any accruals and, therefore, it cannot be affected by accounting conservatism. In the existing literature, the direct tests have been made on the operating cash flow figure and various earnings figures. However, direct tests on various types of accruals have not been made thus far. Moreover, there is no UK evidence on any of these figures covering such a long time period and time series properties have only been shown for earnings figures. Evidence on increases (or otherwise) of accounting conservatism over time in the UK has also not been shown.

Regarding the properties of loss-firms in particular, the following hypotheses are formulated in alternative form:

H^{A}_{3}: *i. The differences between profit and loss firms relate more strongly to the accruals component of earnings than to the cash flow component.*

ii. The asymmetric timeliness of earnings should be higher in cases where earnings reflect bad news.

iii. This is particularly likely in cases where the accruals component of earnings is negative.

The expectations regarding hypotheses $H^0{}_3$ *i.* to $H^0{}_{2,}$ *iii.* are that they will be rejected in favour of alternative hypotheses stated above. None of the hypotheses $H^0{}_3$ *i.* to $H^0{}_{2,}$ *iii* has been explored in the existing literature yet.

The effects of the rules of ex-ante recognition of assets (or news unrelated conservatism, pervasive conservatism) affect the relations hypothesised in $H_{2,a}$, $H_{2,b}$ and $H_{2,c}$ in particular and, indirectly, the other hypotheses stated, too. Combining the decomposition of earnings into operating cash flows and accruals' components and following Pope and Walker (2003) produces the following extension of their main hypothesis stated in alternative form:

$H^A{}_4$: *The more ex-ante conservative a firm is regarding the recognition of assets, the smaller the probability of observing an asymmetric relationship between operating cash flows, earnings and accruals on the one hand and returns on the other using both the general measure of ex-ante conservatism and asset-specific measures of ex-ante conservatism.*

The expectation regarding this hypothesis is that the null version of the hypothesis ($H^0{}_4$) of no difference in asymmetric timeliness of earnings, operating cash flows and different types of accruals between highly ex-ante conservative and highly aggressive ex-ante firms will be rejected. Asset-specific measures of ex-ante conservatism represent a refinement of the results obtained by using an overall, general measure of ex-ante conservatism. In the existing literature, the effect of the general ex-ante conservatism on earnings only has been shown. This work adds to existing literature both by decomposing earnings into its main constituents and by refining the general measure of ex-ante conservatism.

3.10 *CONCLUDING REMARKS*

This chapter has presented the main blocks underpinning the empirical part of this thesis. There are two main types of models of conservatism - the persistence models and Pope and Walker (1999)-type models. This study adds the decomposition of earnings into its main components: operating cash flows and three main types of accruals (working capital accruals, depreciation and special items) into both the persistence models as well as in the Pope and Walker (1999) models. This latter model is also used to study other aspects of accounting conservatism, e.g., changes through time, in the empirical part. The importance of combining the Pope and Walker (1999) models with the earnings decomposition is particularly important in studying the losses and profit observations. The chapter also shows that certain limits must be taken into account when studying the effects of ex-post conservatism and that the same empirical model can result from different theoretical explanations and/or derivations. The specific hypotheses regarding the persistence tests, direct tests, profit and loss separation and ex-ante limitations are also presented. These hypotheses are empirically tested in the next chapter.

4 EMPIRICAL RESULTS

4.1 INTRODUCTION TO EMPIRICAL ANALYSES

This chapter represents the main part of the thesis. It presents relevant aspects regarding the empirical study of accounting conservatism and the main empirical results. The chapter is organised as follows. In section two, variables' definitions are presented by main groups: earnings, accruals, operating cash flows, market variables and other variables. The sample selection procedure is also described in detail in the first section. This is particularly important given that the sample-formation procedure includes some aspects not generally used in existing literature. Moreover, the sign convention used for variables' definitions is described. This is important, as the sign convention used in papers in the area of capital market-based accounting research is not uniform.

In section three general properties of the sample in terms of distributions of variables' values and correlations between pairs of variables are presented, and, where appropriate, formally tested for differences. A number of properties of distributions, correlations and differences are commented upon in term of accounting conservatism. Some of the more important aspects include: skewness measures of earnings' variables, correlations between accruals and operating cash flows, correlations between returns and accruals, variability of returns and variabilities and correlations of operating cash flows and accruals.

The fourth section presents the results of the first of the two ways of capturing the effects of conservative accounting – i.e., the time-series properties of operating cash flows, earnings and accruals on average and separately according to the sign of these changes. The empirical results are formed in a way that enhances comparability with existing literature (in particular with Basu, 1997).

Section five presents the second method of capturing the effects of accounting conservatism – direct tests using Pope and Walker (1999) model. It presents the results as cross-sectional averages, but also makes inferences regarding conservatism through time by using different measures of conservatism. Moreover, the section provides a theoretical explanation of low observed R^2s in some of the results and shows that these are in fact to be expected if accounting is conservative. Section six expands these results by capturing the effects of previous' periods conservative accounting. Complementarily, section seven builds upon and expands alternative measures of the effects of previous periods' conservative accounting.

Section eight attempts to capture the differences between profit and loss firms regarding the differences in application of conservative accounting. The section first presents a motivation for studying profit and loss firms separately. This is important, as there is no uniform "theory of losses". This is followed by observing differences between profit and loss firms in terms of distributional properties and differing correlations between pairs of variables. In the absence of a clear theory of losses, the following sub-section expands the Pope and Walker (1999) model by allowing for (but not requiring) differences between good and bad economic news as well as for differences between profit and loss observations. However, there are econometric difficulties associated with estimation of such a model. They are briefly presented at the end of the section.

Finally, the last section refines further the results obtained by estimating the Pope and Walker (1999) model by operating cash flow, earnings and accruals variables by placing a general and an asset-specific ex-ante limit on these relations, following derivations from the Pope and Walker (2003) modelling of ex-ante conservatism.

4.2 DEFINITIONS OF VARIABLES AND SAMPLE SELECTION

In this section, the details of the main empirical variables used in this study are provided by groups of variables: accounting variables (earnings, accruals, operating cash flows and other accounting variables), market variables and additional economic variables. For each definition of a variable, the relevant *DataStream* codes are provided in parentheses to ensure full transparency and maximise the external validity of this research (Gill and Johnson, 1991, pp. 121-122). Moreover, a reference table, inclusive of definitions and Datastream codes, is provided in Appendix A given the relatively large number of variables employed in this study. Details on sample selection and outliers' removal are also presented.

Accounting variables – earnings. Operating profit (*OP*) is adjusted operating profit (DataStream item #137). Ordinary earnings per share (*ORD*) are defined as net earnings after tax, minority interest and preference dividend on a fully deferred tax basis and adjusted for the effect of extraordinary and exceptional items, non-operating provisions and foreign currency exchange profit/losses (DataStream item #182). Earnings after extraordinary and exceptional items (*EARN*) are ordinary earnings *ORD* plus extraordinary items (DataStream item #193) plus exceptional items (DataStream item #194).

Given that extraordinary and exceptional items constitute an important component of earnings in terms of reflecting asymmetric timeliness of earnings to bad economic news, the two items must be clearly defined. The FRS 3 – *Reporting Financial Performance* defines extraordinary items as (FRS 3, quoted in Davies, Paterson and Wilson, 1999):

> "... material items possessing a high degree of abnormality which arise from events or transactions that fall outside the ordinary activities of the reporting entity and which are not expected to recur. They do not include exceptional items nor do they include prior period items merely because they relate to a prior period" (p. 1506)

and exceptional items as:

> "... material items which derive from events or transactions that fall within ordinary activities of the reporting entity and which individually or, if of a similar type, in aggregate, need to be disclosed by virtue of their size or incidence if the financial statements are to give a true and fair view." (p.1507)

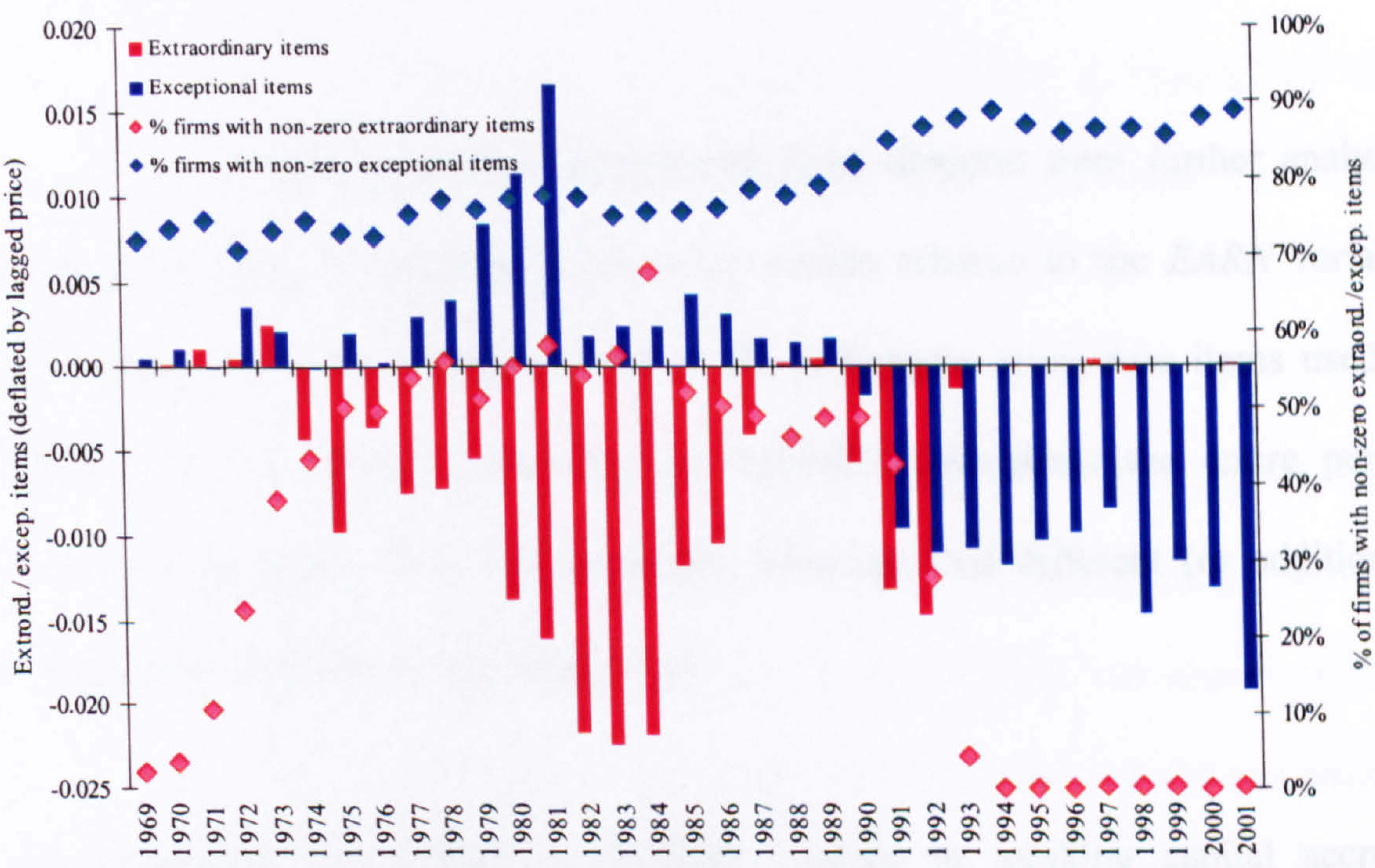
The definition of earnings *EARN* was chosen on the basis that exceptional items appear to have absorbed, on average, most of the items that were classified as extraordinary in the period before the introduction of FRS 3 – *Reporting Financial Performance* became effective for financial year ends on or after 22nd June 1993. Figure 4-1 shows that extraordinary items have effectively disappeared in the post-FRS 3 period, while exceptional items have become both more frequent (88.9% of firms report non-zero exceptional items in 2001 as compared to 72.1% in 1969) and more negative on average (–1.910% of lagged price in 2001), as compared with positive values, on average, of these items in the years in the pre-FRS 3 period (for example, +0.044% in 1969). In the pre-1993 period the effect of exceptional items is in 19 out of 24 years to reverse, on average (as opposed to pre-FRS 3 years), the losses passed through extraordinary items. After the 1990 and especially after the introduction of FRS 3 firms appear to pass losses through exceptional items. Also, in none of the FRS 3-years are exceptional items positive on average, suggesting that firms include most gains in ordinary earnings. This finding is consistent also with Strong and Walker (1993), who find that for a sample of UK firms in the period 1971–1986 (i.e., well pre-FRS 3), exceptional items have a positive skew and extraordinary items have a negative skew. This is consistent with passing large one-time gains as part of ordinary earnings (through exceptional items) and large negative items through extraordinary items. Related to this, Kinney and Trezevant (1997) find that income-decreasing special items in the US tend to be displayed as separate line items while income-increasing special items are included in the main figures in financial statements and the effect of these items noted only in a footnote. Allowing for information inefficiencies, the former presumably emphasises the transitory nature of these items, while the latter leads investors to believe that income-increasing special items are permanent. These tendencies persist even after controlling for the average level of special items that might reflect different economic conditions (i.e., in some years it is to be expected that special items will be negative on average). Complementary data on the percentages of firms reporting negative and positive special items in sample years as well as the time-trend analysis is provided in Appendix B (Elliott and Hanna, 1996).

To summarise this discussion, Guntert (1995) reports that Sir David Tweedie, the then-chairman of the Accounting Standards Board, observed that:[44]

> "...material one-off items were exceptional if they were credits and extraordinary if they were debits."

The pattern of the magnitude of extraordinary items by year is also similar to the pattern in Figure 3 in Pope and Walker's (1999) study, although the two figures are not strictly comparable due to different deflators (ending versus opening share price used in this study, following Easton, 1999).

Figure 4-1: Average magnitudes and frequencies of extraordinary and exceptional items for the contemporaneous sample (1969-2001)



Notes to Figure 4-1: Extraordinary items (DataStream item #193) and exceptional items (DataStream item #194) are per share and deflated by the opening share price P_{t-1}. Magnitudes and frequencies are for the contemporaneous sample as defined below.

Several other definitions of earnings have been formulated and tested, given that Pope and Walker (1999) show the comparatively-strong impact different

[44] This article is originally referred by Basu (1999) in his discussion of Pope and Walker (1999).

definitions of earnings in an UK context may have on the results and interpretations of those results. In preliminary phases of this research, some additional definitions have been used and tested:[45]

- earnings after extraordinary items, exceptional items (*EARN*) and exchange rate adjustments;
- retained earnings plus gross/net dividends less transfers to/from reserves;
- pre-tax earnings less tax paid less minority interests and other adjustments less preference dividends;
- retentions plus dividends (gross or net, whichever is applicable in a particular time period) less transfers to/from reserves;
- earned for ordinary.

Some of these and other adjustments were dropped from further analyses subsequently either because the preliminary results relative to the *EARN* variable were affected only very marginally, if at all, or because some data items used to calculate these earnings figures are not available throughout the entire period covered in this study. It is acknowledged, however, that different (or additional) earnings definitions could have been used.

Accounting variables – accruals. Change in working capital accruals (hereafter working capital accruals), *ΔWCAP*, is defined as the change in accounts receivables (*ΔDebtors*, DataStream item #448) plus change in stock and work in

[45] During the initial phases of the research the DataStream help line was contacted several times and consulted as to what earnings figure to use so that it would ensure maximum comparability through such a long time span covered in this study. Some of these definitions result from such discussions/suggestions.

progress (*ΔStock*, DataStream item #445) minus change in accounts payables (*ΔCreditors*, DataStream item #417). All components of working capital accruals are taken directly from the cash flow statement, if available, or funds flow statement in the pre-original FRS 1 – *Cash flow statements* period, rather than calculated as balance sheet differences. However, before the introduction of SSAP 10 – *Statements of source and application of funds* in July 1975, it would appear that the amounts shown are calculated as balance-sheet differences (e.g., Cadbury Schweppes, 1970, p. 19 and p. 25 – footnote 15). Using cash flow/funds flow statements helps avoiding the effects of the errors-in-variables problem as described by Hribar and Collins (2001), although in the main results of this study the components of working capital accruals are used as dependent (rather than independent) variables, which in itself mitigates the errors in variables problem (see section 2.3 above). Depreciation and amortisation, *DEP*, is defined as total depreciation (DataStream item #402) plus amortisation (DataStream item #562; assumed to be zero where missing).

Special items, *SPEC*, are calculated as operating profit (*OP*) less earnings after extraordinary and exceptional items (*EARN*), adjusted for preference dividends from the profit and loss statement (DataStream item #181), net interest payable (notes to the financial statements, DataStream item #153 minus #143) and taxation (profit and loss statement and notes to the financial statements, DataStream item #160 minus #162 plus #169 plus #161 plus #164). Special items thus defined correspond to a greater extent to the sum of exceptional and extraordinary items (Pearson's bivariate correlation coefficient for available observations pooled within the contemporaneous sample, as defined in a later section, is 0.861 and is higher for non-positive returns firms, 0.927, and lower for positive returns firms, 0.804). The single most important potential problem that arises from this definition of *SPEC* is that the difference between *OP* and *EARN* likely contains both a cash and an accruals component. Ideally, *SPEC* would only consist of accruals, without any cash components. An attempt has been made to eliminate some of the (potentially) cash component by deducting preference dividends, net interest payable and taxation, items that are part of the difference between *OP* and *EARN* but are likely to be cash-related. However, the adjustments represent only a partial solution, given that they are taken from the profit and loss statement and not the cash flow statement. Given the time period covered in this study and regulation regime changes in this period this measure of special items this was a feasible solution. It is acknowledged that this is a discretionary decision and that other measures of different types of "special" accruals might have been constructed and might have yielded different results. On the other hand, available data precludes the construction of very detailed types of special items (e.g., Francis, Hanna and Vincent, 1996).

Accounting variables – cash flows and other accounting items. Operating cash flows, *OCF*, are calculated as adjusted operating profit (DataStream item #137) plus depreciation and amortisation (*DEP*) less working capital accruals ($\Delta WCAP$) plus an item described by DataStream as "Other adjustments" (DataStream item #404). The operating cash flows calculated in this way are very similar to reported net cash inflows from operating activities. Reported figures are generally available only for fiscal years ending in or after 1992, after the original FRS 1 – *Cash flow statements* was adopted. Pearson bivariate correlation coefficient for available observations within the contemporaneous sample, as defined in a later section, is

0.948. Cash flows other than operating cash flows are disregarded in this study as they cannot be reliably approximated using available data over the time period covered by the sample in this study. Following the procedure employed by Garrod and Hadi (1998) and Hadi (1995, p. 72-76) for investment, financing and taxation cash flows produces estimates whose correlations with actual published post–FRS 1 figures are much lower than those reported by Hadi (1995, p. 72-76) over the time period covered by my contemporaneous sample. A measure of total cash flows, defined as the net change in cash, *ΔCASH*, as in Dechow (1994), is however available (DataStream items #457 before or #1134 after FRS 1 (Revised 1996) become mandatory for fiscal periods ending on or after 23rd March 1997). This measure of total cash flows is used to shed more light on some of the issues explored in this study.

For similar illustrational reasons, a measure of total accruals, defined as *Total Accruals=ΔWCAP+DEP+SPEC*, is also computed. Other accounting variables used in this study are: book value of ordinary (i.e., excluding preference capital) shareholders' equity (*BV*, DataStream item #305) and turnover, *S*, defined as total sales (DataStream item #104). The dummy variable L_t assumes the value of one if $EARN_t$ is non-positive and zero otherwise and, similarly, the L_{t-1} indicator variable assumes the value of one if $EARN_{t-1}$ is non-positive and zero otherwise.[46]

[46] Note that these definitions of dummy variables L_t and L_{t-1} are different from the corresponding variable in, for example, Giner and Rees (2001) that would be analogous to L_t, where dummies are defined as taking the value of one if the value of the underlying variable is *strictly* less than zero. However, the difference between this definition and definition used in this study affects 9 firm-years in the contemporaneous sample after the removal of outliers.

All accounting variables are per share and deflated by the opening price per share (P_{t-1}) in contemporaneous (one fiscal period) models and (P_{t-4}) in lagged (four fiscal periods) models. Exceptions to this general deflation rule are explicitly stated in relevant sections.

Market data – prices, indices and other economic variables. Share prices and other market values are stored in different sections of the DataStream database. The share price, P_t, is the price at the accounting period-end adjusted for capital changes and stock splits/reverse splits (DataStream item *P*) so that the prices used throughout the sample are comparable with the latest figure (Donnelly and Walker, 1995) as well as that they allow a consistent calculation of returns. If the accounting period end does not coincide with a trading day, the value on the trading day immediately preceding the respective balance sheet date is taken. Corresponding to the theoretical models presented in Chapter 3, the return variable(s) $RET_{t,t-1}$ is defined as ex-dividend fiscal-period return (price relative) $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ in the contemporaneous sample and $PET_{t-\tau,t-\tau-1} = (P_{t-\tau} - P_{t-\tau-1})/P_{t-4}$ where $\tau = 0 \ldots 3$, in the lagged sample.

Dummy variables $D_{t-\tau,t-\tau-1}$ assume the value of one if $PET_{t-\tau,t-\tau-1} \leq 0$, and zero otherwise (in contemporaneous versions only one dummy variable is used and thus denoted as $D_{t,t-1}$). Note that the choice of deflator does not influence the value the dummy variables take. This definition of the negative returns dummy differs from definitions employed by, for example, Pope and Walker (1999) and Basu (1997), where strict inequality is employed. This affects 357 observations in the contemporaneous sample (after the removal of outliers) that have $PET_{t-\tau,t-\tau-1} = 0$, a number perhaps unexpectedly high. Excluding these observations from the sample in the preliminary stages of research did not alter any of the conclusions and affected quantitative results only very marginally. For reasons of parsimony, these results are not reported in the thesis.

There are at least two more important issues in calculating the return variables $PET_{t-\tau,t-\tau-1}$. The first issue is whether to use cum-dividend or ex-dividend returns (capital gains). This study evolves from the work of Basu (1997) and Pope and Walker (1999), who argue that where the dependent variable is accounting earnings that includes dividends, then the $PET_{t-\tau,t-\tau-1}$ variables should also include dividends (Basu, 2001). Basu (2001) also provides a short overview of differences in using cum-/ex-dividend returns as the dividend variable. However, using cum-dividend rates of return over the sample window used in this study is not possible due to the lack of data on dividends (or total returns) data. Databases that would allow using such definitions of returns were not available.[47] Consequently, the data sample employed in this study does not allow an empirical test that would indicate whether this difference is important. The assumption is made that the results would be unaffected by this choice. However, consistent with this, Giner and Rees (2001) report that their results are essentially the same regardless of whether cum- or ex-dividend returns are employed. Other related studies in the UK context also exclude dividends (e.g., Donnelly and Walker, 1995), albeit the econometric consequences may be different in other contexts.

[47] DataStream provides a cum-dividend Return Index variable (item *RI*), but this is only available for years 1988 and onwards. Using this variable the period 1969-1987 would have to be omitted.

The second important issue is whether to compound returns or capital gains over the fiscal or over the inter-announcement period. Again, the sample employed in this study does not allow constructing an empirical test that would show whether this difference is important.[48] Regarding this issue it is again assumed that the results would be unaffected by this choice. Consistent with this, Basu, Hwang and Jan (2000) report that using fiscal year accumulation period produced "almost identical" results to those of the inter-announcement period running from 3 months after the previous fiscal year-end to three months after the current fiscal year-end (differences are not tabulated in their paper). Also, their sample covers a relatively long time-period, from 1975-1998, which might highlight the importance of their statement for this research. It appears that more recent applications use fiscal year-periods (e.g., Ryan and Zarowin, 2003; Ball, Kothari and Robin, 2000). In the UK, the inter–announcement period would have to be from six months after the prior fiscal year-end to six months after the current fiscal period, since UK firms have 6 months to prepare and publish annual accounts (Stark and Thomas, 1998), although Donnelly and Walker (1995) and Clubb (1995) use cumulation through end of April for their sample of December year-end firms (i.e., 4 months).

Lagged values of share prices, P_{t-1}, are recorded at the previous balance sheet date, if known. If the previous balance sheet date is not known, it is assumed to be at the current balance sheet date minus 365 days (or 366 days in leap years). This rule is applied also when share prices beyond one lag are recorded (e.g., P_{t-4}). The effect of this rule is that the number of observations in the two samples is maximised. In

[48] The difficulty in creating tests that would show potential differences resulting from different compounding time intervals is (was) of technical rather than substantive nature. The procedure used in an attempt to calculate the exact limiting dates of the inter-announcement interval yielded too many missing or erratic values. If these technical issues were solved, a direct comparison would indeed be possible.

the absence of this rule, a firm would have to be included in the DataStream database at least for two consecutive financial years (so that both opening and closing balance sheet dates would be known) rather than just one financial year using this method. At the same time, this method mitigates potential effects of survivorship bias. To the best of my knowledge, there are no comparable studies that have employed this method. It results from a careful scrutiny of the structure of the DataStream database (also see discussion on potential effects of survivorship bias below).

To control for market-wide effects three control variables are also used: the FTSE All share index (DataStream item *FTALLSH*), the 91-day UK Treasury bill discount (DataStream item *UKTRSBL%*) and the average gross redemption yield on 10-year UK gilts (DataStream item *UKMEDYLD*). The data on the FTSE All share index is available for all trading days. If the accounting period end does not coincide with a trading day the last value known on the trading day immediately preceding the balance sheet date is taken. The data on government securities is available for the last day of the month and on the 15th in each month for the two types of securities respectively. If the accounting period end does not coincide with a trading day the value immediately preceding the balance sheet date is taken. The differences in recording date might affect the results presented in this study. However, the choice of government securities' yields is conditional on the length of time series of interest rates' data and the corresponding database coverage. Yearly inflation rates are also collected from DataStream (DataStream code *UKRPANNL*) and used for comparative purposes.

Data collection and samples formation. Financial statement data, share price data and other market data used in this study are collected from Thompson Financial DataStream as per 21/01/2002. Firms with double class securities and/or quoted preference shares were eliminated. Double-class securities and preference shares have different rights attached to them and the pricing of these securities may differ. Using large samples effectively prevents the inclusion of these securities, as their properties cannot be inferred automatically from the database. Even if they were, the nature of the link between market values of these securities and accounting data would be different compared to ordinary shares. Financial companies were also excluded. Both the multiple-class and financial-companies restrictions are still applied in recent research in both finance (e.g., Gregory, Harris and Michou, 2001) and accounting literature (e.g., Rees, 1997), although Danbolt and Rees (2002) show that for certain classes of financial firms the relationships between financial statements and market values are similar to non-financial firms. However, a motivation to exclude financial firms is that one of the central variables studied in this thesis is the working capital accruals (Gore, Pope and Singh, 2001). The downloaded sample consisted of 35,319 non-financial firm-years with financial statement data from 31/12/1964 to 30/10/2001, already excluding firms with multiple-class securities (e.g., firm-years with voting and non-voting shares). This sample was then reduced considerably due to (number of observations deleted in parenthesis): missing, negative or zero book value (584), missing ordinary earnings data (1,674), missing average number of shares (81), duplicate firm-years (1,873) and missing lagged price (1,933). As there were only 32 observations with the required contemporaneous set of data in the period from 1964 to 1967 these observations were dropped, leaving thus 29,142 firm-years in the sample at this stage.

The accounting period ends are not restricted to December 31st calendar year-end date, as this would reduce the sample considerably. Only 33.5% (9,763) of observations in the sample at this stage had a December 31st accounting period end. A similar percentage of non-December year-end firms for the UK sample is reported by Ball, Kothari and Robin (2000). There are no UK studies that would indicate any systematic differences between December 31st and non-December 31st accounting period ends firms. However, Smith and Pourciau (1994) show that there are systematic differences between December 31st and non-December 31st US firms in terms of size and market risk. Specifically, they find that December 31st-year end firms are larger and have smaller systematic risk. More generally, the accounting year-ends might be set by firms in low-season periods. Firms within the same industry would thus tend to have similar year-ends. Simth and Pourciau (1994) find that retail firms tend to have non-December year ends. Industry differences might thus be mirrored by their choice of accounting year end.[49] To the extent that these differences may exist in the UK, my study produces more general results relative to studies that use only December 31st firms. On the other hand, one consequence of this decision is that it is not possible to control for market-wide effects in accounting variables by deducting a market-wide average level of accounting earnings (or earnings components) from firm-year specific earnings (or earnings component), analogously to sensitivity analyses in Basu (1997).

[49] To check for possible industry differences, section 5.3 shows the main results for five different industries.

Accounting period length is, however, restricted to 365±92 days (±3 months). This is less restrictive than in recent research – for example, Giner and Rees (2001) restrict their sample to within 365±30 days. However, a detailed inspection of the data reveals that a significant number of firms in the initial sample that have switched accounting year-ends have done so within the period of 365±92 days. In some cases, the switches involved even longer periods. The method of data collection ensures that all switches are genuine and not a result of errors in data downloading. It is assumed, however, that there are no errors in the way DataStream collects the data. In cases where the accounting period exceeds the 365±92 days limits, the observations are not deleted, but the method of extracting lagged share prices changes. In these cases, the lagged price P_{t-1} is defined as the price at the balance sheet date minus 365 days (or 366 days so that leap years are accounted for). An equivalent procedure is applied in recording lagged share prices beyond one lag. This procedure of determining the date at which the lagged price is recorded is an alternative to deleting observations due to too wide time intervals where general economic conditions might have changed significantly and confound the results obtained. Again, it is acknowledged that this is a discretionary decision that results in a larger sample. On the other hand, this should reduce the survivorship bias.

The data was downloaded from the active research list and all dead UK equities' lists to minimise the effects of survivorship bias. Survivorship bias may play an important part in estimations that require lagged share price data by up to four years. This effect is partially offset by the way DataStream collects financial statements and share prices data (these are held in separate parts of the database). Historically, in the contemporaneous sample used in this study, DataStream database starts recording market values 554.8 days (or 1.52 years) (medians: 272 days or 9 months) before the first balance sheet date. This further supports the decision not to exclude observations with missing lagged balance sheet dates – these exclusions would tend to increase any potential effects of survivorship bias.[50]

Outliers removal. To control for outliers, top and bottom one percent of observations on each of the main accounting and market variables of the pooled samples (i.e., outliers' removal is not performed on an annual basis) are eliminated. The first main sample, which termed the contemporaneous sample, excludes all observations on deflated, per share accounting variables *OCF*, *OP*, *ORD*, *EARN*, *ΔWCAP*, *DEP*, *SPEC* and market variable $RET_{t,t-1}$ that are bigger (smaller) than the top (bottom) one percentile of each pooled distribution simultaneously. The contemporaneous sample covers the period 1969-2001 inclusive and contains 25,888 firm-years after eliminating the outliers. To arrive at the second main sample, termed the lagged sample, all observations on deflated, per share accounting variables *OCF*, *OP*, *ORD*, *EARN*, *ΔWCAP*, *DEP*, *SPEC* and market variables $PET_{t-\tau,t-\tau-1}$, where $\tau = 0...3$ that are bigger (smaller) than the top (bottom) one percentile simultaneously are eliminated. Note that the deflators are different in the contemporaneous and lagged samples (P_{t-1} and P_{t-4} respectively). Thus the observations in the lagged sample are not, strictly speaking, a sub-sample of the contemporaneous sample, although the firm has to survive for at least four periods to be included in the lagged sample and would usually, but not necessarily, be included in the contemporaneous sample. There are 20,536 firm-years in the lagged sample.

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[50] It is an (open) empirical question wheter these effects would be significant. This question is left to further research.

It is acknowledge that this method of outliers' removal is discretionary. First, outliers based on individual components of working capital accruals are not removed, but only on the aggregate variable *ΔWCAP*. Second, outliers based on the variable *ΔCASH* are also not removed. Third, some analyses are also conducted and shown for illustrative purposes on total accruals, and again, outliers based on the *Accruals* (*tot.*) variable are not removed. These decisions affect the sample composition, (some of) the results presented and their interpretation. On the other hand, both the contemporaneous and lagged samples used in this study appear to be more restrictive (i.e., including less extreme values and exhibiting less variability) than samples used in studies in the comparable literature. The issue of comparability of samples with existing literature is described in section 4.3.

Sign convention. Throughout this study, the sign convention employed by most contemporary papers is used (e.g., Dechow, 1994; Dechow, Kothari and Watts, 1998; Garrod and Hadi, 1998; Barth, Cram and Nelson, 2001): a negative sign of an accounting variable denotes an earnings-decreasing item (cash flow-increasing item) and a positive sign indicates an earnings-increasing item (cash flow-decreasing item). For example, positive *ΔWCAP*, *ΔDebtors* and *ΔStock* indicate higher ending values of respective balance sheet accounts, higher earnings and, *ceteris paribus*, lower operating cash flows. The converse applies for the *ΔCreditors* variable – more negative values indicate higher ending value of creditors' accounts in the balance sheet, lower earnings and higher operating cash flows. More negative values of the depreciation and amortisation expense *DEP* indicate a higher (i.e., more earnings-reducing) depreciation charge.

This sign convention is often expressed conceptually with the decomposition of earnings into its constituent parts as presented above in section 3.7:

EARNINGS = CASH FLOWS + ACCRUALS

Note that the opposite convention is applied in, for example, Rayburn (1986) and McLeay, Kassab and Helan (1997). Also, this "opposite" sign convention is employed in the theoretical analyses of the Feltham and Ohlson (1996) framework (see discussion of the clean surplus relation, *ibid.*, p. 215).

A note on presentational formats of data and method of inferences. Throughout this study, cross-sectional averages following Fama and MacBeth (1973) are employed to present regression results and make inferences except where explicitly noted (also see Kothari, 2001; Fama and French, 2000; Campbell, Lo and MacKinlay, 1995, pp. 215-217; Christie, 1987). This type of estimation involves the following procedure. First, annual regressions are estimated and estimated parameters and R^2s collected. Given the sample, there are generally T individual year regressions for each dependent variable (the actual number of individual-year regressions may be lower in some cases in this thesis due to data requirements). Next, an equally-weighted average of these estimated regression coefficients is calculated so that a time-series of estimated parameters is studied. It is this number that is presented in the tables and commented upon in the text. For example, denoting a general true regression coefficient for a given year t as γ_t, t=1...T, then, first, the T coefficients $\hat{\gamma}_1 ... \hat{\gamma}_T$ are estimated, and, second, the average of these coefficients is calculated as:

$$\hat{\gamma} = (\hat{\gamma}_1 + ... + \hat{\gamma}_T) / T \tag{4-1}$$

The test hypothesis regarding this coefficient stated in alternative form is:

H^A: *The cross-sectional average of the* $\hat{\gamma}_1 ... \hat{\gamma}_T$ *does not equal zero* (or, equivalently, $\hat{\gamma} \neq 0$).

The corresponding test statistic is:

$$t = \frac{\hat{\gamma}}{s.e.(\hat{\gamma}) / \sqrt{T}} \tag{4-2}$$

distributed with (T–1) degrees of freedom. In this study, the values are T= 33 years and the corresponding degrees of freedom (T–1)= 32. This number is sufficiently large for the corresponding sample of cross-sectional estimates of parameters γ_t to be deemed large (e.g., Anderson, Sweeney and Williams, 1993, pp. 308-313). Critical values of the test statistic are $|t_c|$= 2.7385 at the 1% significance level, $|t_c|$= 2.0369 at the 5% and $|t_c|$= 1.6939 at the 10% significance level. In this research, inferences based on the Fama-MacBeth (1973) procedure are based on the 5% level. The corresponding t-statistics are always shown when applicable. Based on (4-2), the standard errors can be calculated. The t-statistics are not shown in cases where cross-sectional averages of estimated regression coefficients are summed or used in ratios, as is the case with total and relative total bad news coefficients. The t-statistics is however shown for the cross-sectional average of estimated R^2s.

Both the sample-selection procedure and the method of estimation and inference used minimise the effects of survivorship bias. This is particularly important in terms of tests in section 4.4. There, survivorship bias would imply more earnings-increasing changes in most of the variables than expected by chance (Kothari, 2001), which would work against finding mean-reversion in earnings and some components (i.e., a random-walk process would be more likely to be observed).

All other presentations are generally for various pooled samples and, where applicable, significance determined at the 1% level ($|t_c|$= 1.960). In particular, all descriptive statistics' tables and correlations matrices are for the pooled sample (also see the outliers' removal procedure above). This is a discretionary decision and the effects of some of these procedures are presented in the sensitivity analyses section.

4.3 GENERAL PROPERTIES OF THE CONTEMPORANEOUS AND LAGGED SAMPLES

Table 4-1 provides the contemporaneous overall descriptive statistics for the contemporaneous and lagged samples covering the period 1969-2001. The statistics are for the pooled sample, rather than cross-sectional averages, and correspond to the applied method of outliers' removal (outliers are removed on a pooled-sample basis rather than on a year-by-year basis).

The descriptives show that both the contemporaneous and lagged samples are generally comparable to UK samples used in recent similar literature (Pope and Walker, 1996; Ball Kothari and Robin, 2000; Giner and Rees, 2001), at least to the extent that variables' definitions may be assumed comparable and the importance of different time periods assumed away. One of the important differences with the samples in these studies are narrower ranges of variables *EARN* and *ORD*, i.e., the sample in this study is less extreme in respect to these two variables. Both earnings measures' means and medians are, as expected, lower than the *OCF* mean and median, since *OCF* does not include a charge for capital investments and *EARN* and *ORD* include a weighted average of past investment in the form of depreciation and amortisation charge *DEP* (Ball, Kothari and Robin, 2000).

Third and second moments of distributions of variables also provide an indirect indication of accounting conservatism. Consistent with conservative accounting is the negative skewness (median is higher than the mean) of the *EARN* variable. Conservative accounting results in a timely recognition of large, complete, capitalised amounts of bad economic news. This results in a reduction of the mean of the *EARN*-distribution, but a lesser change in the median. Good economic news is, on the other hand, recognised only gradually in small, but persistent amounts as they flow through to financial statements (Givoly and Hayn, 2000). Consistent with the notion that accounting conservatism is an accruals phenomenon, any accounting item that is constructed with accruals (i.e., earnings and accruals themselves) should be negatively skewed (Watts, 2003). In this research, the variable *EARN* is the earnings variable which includes the highest level of accruals. Those accounting items that are most likely to reflect the application of ex-post conservatism should exhibit the highest asymmetry. Special items (*SPEC*) in fact do exhibit a highly negatively skewed distribution, as do depreciation *DEP* and *ΔCreditors*. Against negative skewness of the *EARN* variable, is the (unusual or unexpected) positive skewness of the *ORD* (and *OP*) variable (the median is lower than the mean). These findings are consistent with economic gains being incorporated in ordinary income as "regular" items and economic losses as exceptional or extraordinary items ("special items" in this study). Similar UK descriptives are also reported by Charitou, Clubb and Andreou (2001) and Charitou and Clubb (1999) for their equivalent of ordinary earnings (the statistics differ slightly because they include only the period 1985-1993 and 1985-1992 respectively and may differ because of possible differences in the databases employed).

Similarly, the variable *RET* exhibits a narrower range, a standard deviation close to Pope and Walker's (1999), and lower mean and median. There are, however, significantly more observations with non-positive returns (44.2% versus 37.6% in their study, but note differences in definition of $D_{t,t-1}$). Skewness of *RET* is positiveand since there is no asymmetry in incorporating expected economic gains/losses but firms in general are expected to incur, on average, more economic gains than losses. Since *RET* is not bounded by any rules regarding the incorporation of expected economic gains/losses, its variability is predicted and found to be the highest.

Similar conclusions can also be reached in respect of comparisons to Giner and Rees' (2001) and Ball, Kothari and Robin's (2000) UK samples,

Table 4-1: Descriptive statistics for the contemporaneous and lagged samples, 1969-2001

PANEL A: Contemporaneous sample (n=25,888)	Mean	St Dev	Min	Q_{25}	Med.	Q_{75}	Max	Skew
Cash flows								
OCF	0.227	0.243	-0.393	0.091	0.174	0.303	1.895	1.820
Earnings								
OP	0.197	0.188	-0.304	0.095	0.154	0.256	1.439	1.683
ORD	0.091	0.097	-0.422	0.053	0.084	0.128	0.615	0.220
EARN	0.083	0.122	-0.740	0.046	0.083	0.131	0.717	-0.783
Accruals								
ΔWCAP	0.043	0.172	-0.780	-0.018	0.021	0.094	1.010	0.545
- of which *ΔDebtors*	0.055	0.178	-3.545	-0.004	0.025	0.093	4.766	2.243
- of which *ΔStock*	0.048	0.171	-3.184	-0.003	0.013	0.079	2.890	1.148
- of which *ΔCreditors*	-0.060	0.206	-5.863	-0.096	-0.024	0.007	3.164	-2.652
DEP	-0.077	0.076	-0.602	-0.097	-0.054	-0.029	-0.002	-2.572
SPEC	-0.011	0.074	-0.567	-0.020	0.000	0.010	0.314	-1.824
Returns								
$RET_{t,t-1}$	0.129	0.466	-0.735	-0.176	0.058	0.347	2.422	1.217
$D_{t,t-1}$	0.442	0.497	0.000	0.000	0.000	1.000	1.000	0.235

PANEL B: Lagged sample (n=20,536)	Mean	St Dev	Min	Q_{25}	Med.	Q_{75}	Max	Skew
Cash flows								
OCF	0.313	0.328	-0.518	0.122	0.231	0.421	2.771	1.934
Earnings								
OP	0.290	0.292	-0.287	0.114	0.211	0.380	2.432	2.104
ORD	0.141	0.148	-0.355	0.060	0.112	0.190	1.137	1.571
EARN	0.133	0.172	-0.621	0.051	0.110	0.194	1.270	0.873
Accruals								
ΔWCAP	0.074	0.241	-0.865	-0.022	0.026	0.127	1.737	1.646
- of which *ΔDebtors*	0.086	0.253	-2.734	-0.006	0.032	0.125	4.815	3.326
- of which *ΔStock*	0.078	0.254	-2.570	-0.006	0.017	0.108	4.706	3.169
- of which *ΔCreditors*	-0.090	0.304	-8.000	-0.128	-0.030	0.010	3.548	-5.094
DEP	-0.102	0.100	-0.830	-0.128	-0.072	-0.041	-0.003	-2.692
SPEC	-0.013	0.095	-0.626	-0.027	0.000	0.014	0.436	-1.246
Returns								
$PET_{t,t-1}$	0.172	0.706	-2.283	-0.177	0.066	0.400	4.542	1.621
$PET_{t-1,t-2}$	0.178	0.610	-1.473	-0.161	0.078	0.400	3.950	1.603
$PET_{t-2,t-3}$	0.158	0.501	-0.941	-0.162	0.077	0.382	3.028	1.357
$PET_{t-3,t-4}$	0.125	0.426	-0.698	-0.159	0.065	0.342	2.259	1.053
$D_{t,t-1}$	0.431	0.495	0.000	0.000	0.000	1.000	1.000	0.277
$D_{t-1,t-2}$	0.420	0.494	0.000	0.000	0.000	1.000	1.000	0.323
$D_{t-2,t-3}$	0.423	0.494	0.000	0.000	0.000	1.000	1.000	0.313
$D_{t-3,t-4}$	0.430	0.495	0.000	0.000	0.000	1.000	1.000	0.283

Variables are defined as follows: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock and work in progress, *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items. All variables are per share and scaled by P_{t-1} in the contemporaneous and P_{t-4} in the lagged sample, $RET_{t,t-1}$ is defined as $RET_{t,t-1}= (P_t-P_{t-1})/P_{t-1}$ in the contemporaneous and $PET_{t-\tau,t-\tau-1}= (P_{t-\tau}-P_{t-\tau-1})/P_{t-4}$ in the lagged sample and $D_{t-\tau,t-\tau-1}$ are dummy variables defined as $D_{t-\tau,t-\tau-1}$={1 *if* $PET_{t-\tau,t-\tau-1} \leq 0$; 0 otherwise}. The definitions of dummy variables are independent of deflators.

notwithstanding the differences in databases used and in some of the definitions of variables (in particular, Ball, Kothari and Robin, 2000, use cum-dividend returns rather than price relatives).

Overall, the two main samples used in this study are generally less extreme than, but otherwise generally comparable with, the samples used in related literature. On the one hand, this might imply that the results are potentially less driven by influential observations, but on the other hand potentially informative observations that would convey significant economic conclusions (Ball, Kothari and Robin, 2000) might have been removed. To account for these influences, Appendix C, Appendix D and section 5.7.3 show in full how the inclusion of outliers affects the main results and some additional analyses.

Table 4-2 shows descriptive statistics for the contemporaneous sample split by good news (Panel A) and bad news (Panel B). Good news observations exhibit higher deflated operating cash flows and lower aggregate accruals (–0.036 for good news versus –0.056 for bad news; not shown in table). Average aggregate accruals represent 30.4% of operating cash flows for bad news observations and only 13.7% for good news firms. Of the accruals components, *SPEC* for bad news observations is more than twice as large as for good news observations.

Formal tests of the differences in mean values of earnings and earnings components are summarised below in Table 4-3. For each deflated accounting item in the two panels of Table 4-2, the following hypothesis in alternative form is made:

Table 4-2: Descriptive statistics for the contemporaneous sample split by good news (positive returns) and bad news (non-positive returns), 1969-2001

PANEL A: Good news only (n=14,445)	Mean	St Dev	Min	Q_{25}	Med	Q_{75}	Max	Skew
Cash flows								
OCF	0.261	0.260	-0.391	0.113	0.201	0.347	1.895	1.711
Earnings								
OP	0.238	0.200	-0.304	0.119	0.184	0.304	1.430	1.689
ORD	0.117	0.096	-0.420	0.071	0.102	0.153	0.611	0.645
EARN	0.113	0.114	-0.735	0.067	0.101	0.156	0.673	-0.268
Accruals								
ΔWCAP	0.055	0.181	-0.779	-0.015	0.026	0.109	1.010	0.758
- of which *ΔDebtors*	0.070	0.189	-1.877	0.001	0.033	0.111	4.766	3.288
- of which *ΔStocks*	0.061	0.181	-3.184	-0.001	0.017	0.092	2.890	1.362
- of which *ΔCreditors*	-0.076	0.224	-5.863	-0.114	-0.031	0.002	3.164	-3.253
DEP	-0.082	0.080	-0.602	-0.103	-0.057	-0.031	-0.002	-2.436
SPEC	-0.009	0.073	-0.562	-0.020	0.000	0.011	0.314	-1.580
Returns								
$RET_{t,t-1}$	0.425	0.407	0.000	0.136	0.303	0.574	2.422	1.808
PANEL B: Bad news only (n=11,433)	**Mean**	**St Dev**	**Min**	**Q_{25}**	**Med.**	**Q_{75}**	**Max**	**Skew**
Cash flows								
OCF	0.184	0.212	-0.393	0.070	0.144	0.250	1.882	1.918
Earnings								
OP	0.144	0.156	-0.304	0.068	0.120	0.195	1.439	1.521
ORD	0.058	0.089	-0.422	0.032	0.063	0.095	0.615	-0.538
EARN	0.044	0.121	-0.740	0.018	0.061	0.097	0.717	-1.419
Accruals								
ΔWCAP	0.028	0.159	-0.780	-0.021	0.016	0.078	1.009	0.062
- of which *ΔDebtors*	0.035	0.161	-3.545	-0.011	0.017	0.071	2.096	-0.006
- of which *ΔStocks*	0.033	0.156	-1.655	-0.007	0.008	0.063	1.509	0.637
- of which *ΔCreditors*	-0.040	0.180	-2.170	-0.075	-0.016	0.014	2.159	-0.989
DEP	-0.070	0.070	-0.583	-0.089	-0.049	-0.027	-0.002	-2.759
SPEC	-0.013	0.074	-0.567	-0.021	0.000	0.008	0.314	-2.119
Returns								
$RET_{t,t-1}$	-0.245	0.181	-0.735	-0.364	-0.209	-0.095	0.000	-0.669

Variables are defined as follows: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock and work in progress, *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items. All variables are per share and scaled by P_{t-1} in the contemporaneous and P_{t-4} in the lagged sample, $RET_{t,t-1}$ is defined as $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}$ are dummy variables defined as $D_{t,t-1}$ ={1 if $RET_{t,t-1}\leq 0$; 0 otherwise}. The definitions of dummy variables are independent of deflators.

$$H^{A}\text{: } \overline{Y}_{GN} - \overline{Y}_{BN} \neq 0$$

where $\overline{Y}_{GN}$ and $\overline{Y}_{BN}$ represent mean values of deflated accounting variables listed in the leftmost column of Table 4-2. Thus, the alternative form of the hypothesis indicates that differences in average values of accounting variables between the good news and the bad news sample are to be expected. The independent-samples version of the test of differences of means that assumes the two groups of observations separated by good and bad economic news are independent, but have equal variances, is employed. The test statistic under these assumptions is (Anderson, Sweeney and Williams, 1993, pp.347-352):

$$t = \frac{(\overline{Y}_{GN} - \overline{Y}_{BN})}{\sqrt{\frac{(n_{GN}-1)\sigma^2_{Y_{GN}} + (n_{BN}-1)\sigma^2_{Y_{BN}}}{(n_{GN}+1)+(n_{BN}+1)}}\sqrt{\frac{1}{n_{GN}}+\frac{1}{n_{BN}}}} \tag{4-3}$$

distributed at (n_{GN}+n_{BN} – 2) degrees of freedom, where, additionally, n_{GN} and n_{BN} are the numbers of observations affected by good and bad news respectively and $\sigma^2_{Y_{GN}}$ and $\sigma^2_{Y_{BN}}$ are the variances of deflated accounting variables for the two groups.

Additionally, the Mann-Whitney-Wilcoxon non-parametric test is employed (Anderson, Sweeney, Williams, 1993, pp. 721-727; Stata Corporation, 2001, pp. 213-220). The hypothesis stated in alternative from is:

H^A: *Two populations are not identical.*

and the test statistics is:

$$z = \frac{T - E[T]}{\sqrt{\text{var}(T)}} \tag{4-4}$$

where $T = \sum_{i=1}^{n_{GN}} R_{GN,i}$ is the sum of ranks $R_{GN,\,i}$ in the good news sample, $E[T]= n_{GN}(n_{GN} + n_{BN} + 1)/2$ and $\text{var}(T) = (n_{GN} n_{BN} \sigma^2)/(n_{GN} + n_{BN})$ and σ^2 is the variance of the combined ranks r_i of the total contemporaneous sample $\sigma^2 = \frac{1}{n-1} \sum_{i=1}^{n_{GN}+n_{BN}} (r_i - \bar{r})^2$.

The results of both formal tests are shown below in Table 4-3. Using both tests, the good news and bad news sub-samples differ. Compared to the bad news sample, good news firms have larger values of deflated accounting items in the absolute sense. The only difference is the special items *SPEC*, which are on average more earnings-reducing in the case of bad news firms.[51] This is consistent with (an important part of) bad news being passed through special items and with accounting conservatism.

Table 4-3: Formal tests of differences in means and medians between good and bad economic news firms, pooled sample, 1969-2001

	Variables	Mean diff. ($Y_{GN} - Y_{BN}$)	*t*-stat	MWW *z*-stat.
Cash flows				
	OCF	0.078	25.939	29.705
Earnings				
	OP	0.094	41.481	46.550
	ORD	0.059	50.909	58.370
	EARN	0.069	47.189	54.750
Accruals				
	ΔWCAP	0.028	12.959	11.468
	- of which *ΔDebtors*	0.035	15.855	19.737
	- of which *ΔStocks*	0.028	13.294	14.506
	- of which *ΔCreditors*	-0.036	-13.879	-18.380
	DEP	-0.012	-12.944	-13.723
	SPEC	0.004	4.752	4.629
	Accruals (total)	0.020	7.762	6.263

Notes. Variables are defined as follows: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock , *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items. All variables are per share and scaled by P_{t-1}. MWW *z*-stat. is the Mann-Whitney-Wilcoxson *z*-statistic. See Table 4-2 for a full set of descriptives by the sign of the economic news.

[51] Compare Table 4-2 and Table 4-3.

Table 4-4 reports Pearson's bivariate correlation coefficient (Spearman's rank correlation coefficient) below (above) the diagonal. Correlations between pairs of variables are generally signed as expected given the underlying economic relations between the two variables in a pair. Current-period returns are positively associated with operating cash flows and all earnings measures. The correlation between returns and earnings is stronger than between returns and operating cash flows (Charitou, Clubb and Andreou, 2001). Current-period returns are only weakly positively correlated with aggregate accruals (*Accruals* (*tot.*)). They are, however, positively correlated with earnings-increasing accruals measures and negatively with earnings-decreasing accruals. However, all individual accruals' components exhibit statistically (and presumably economically) significant correlations with returns, which suggests that accruals have an important role in reflecting economic news. An exception to this is the special items (*SPEC*). Assuming that current bad news is written-off through special items (*SPEC*) (constituting mostly of extraordinary/exceptional items), a weak positive correlation with current-period returns is surprising at this stage. This suggests that bad news, reflected in returns, is passed through other accruals' components.

All individual working capital accruals' components are strongly negatively correlated with operating cash flows. This is consistent with operating accruals being used to smooth temporary changes in operating cash flows to produce a less variable time-series of earnings (Dechow, 1994), or, in other words, to remove negative serial correlation in operating cash flows (Ball, Kothari and Robin, 2000).

Table 4-4: Correlation matrix for the contemporaneous sample (Pearson's below and Spearman's above diagonal), 1969-2001

n=25,888	*OCF*	*OP*	*ORD*	*EARN*	*ΔWCAP*	*ΔDebtors*	*ΔStocks*	*ΔCreditors*	*DEP*	*SPEC*	*Accruals (tot.)*	$RET_{t,t-1}$
OCF		0.620	0.505	0.417	-0.359	-0.069	-0.111	-0.168	-0.591	-0.100	-0.573	0.229
OP	0.651		0.863	0.761	0.310	0.327	0.359	-0.306	-0.449	-0.053	0.086	0.352
ORD	0.472	0.845		0.878	0.290	0.291	0.332	-0.271	-0.294	0.045	0.154	0.431
EARN	0.333	0.697	0.854		0.294	0.281	0.330	-0.252	-0.225	0.325	0.283	0.405
ΔWCAP	-0.422	0.355	0.339	0.331		0.533	0.599	-0.114	-0.034	0.040	0.784	0.088
ΔDebtors	-0.091	0.290	0.254	0.233	0.494		0.382	-0.615	-0.117	0.005	0.395	0.151
ΔStocks	-0.150	0.360	0.337	0.319	0.630	0.318		-0.512	-0.063	0.024	0.481	0.113
ΔCreditors	-0.150	-0.252	-0.215	-0.189	-0.114	-0.715	-0.577		0.134	0.024	-0.056	-0.141
DEP	-0.605	-0.433	-0.226	-0.126	-0.041	-0.115	-0.069	0.123		0.095	0.362	-0.111
SPEC	-0.141	-0.078	0.041	0.483	0.040	*0.003*	0.011	0.022	0.126		0.345	0.031
Accruals (tot.)	-0.628	0.109	0.215	0.405	0.837	0.372	0.506	-0.042	0.381	0.439		0.045
$RET_{t,t-1}$	0.225	0.330	0.377	0.342	0.094	0.120	0.100	-0.108	-0.128	*0.016*	0.037	

Notes. Pearson's bivariate (Spearman's rank) correlation coefficients below (above) the diagonal. *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock , *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and the measure of total accruals is *Accruals (tot.)=ΔWCAP+DEP+SPEC*. All variables are per share and scaled by P_{t-1}, returns variable $RET_{t,t-1}$ is defined as $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$. All coefficients are statistically significant at the 1% level, except the Pearson's bivariate coefficient between $RET_{t,t-1}$ and *SPEC*, where α=0.0116 and Spearman's coefficient between variables *ΔDebtors* and *SPEC* where α=0.447. Both coefficients are italicised.

The accruals components *ΔDebtors* and *ΔStock* on the one hand and *ΔCreditors* on the other are strongly negatively correlated. This is likely due to growing firms where the requirements for both the current asset components and the current liability component are likely to be increasing (Sloan, 1996). By expanding operations, firms sell more and have more debtors and buy more from suppliers and thus have more creditors. To support higher sales it is likely that firms will also have higher stock and work in progress.

Splitting the correlation matrix by good/bad news (Table 4-5) reveals some additional interesting points. In the bad news sub-sample, current returns are positively correlated with aggregate accruals, but slightly negatively (Pearson's correlation coefficient is statistically significant at the 5% level) in the good news sub-sample. Therefore, in the good news sub-sample, the higher the returns (*RET*), the more negative (i.e., more earnings-decreasing) the aggregate accruals. Conversely, in the bad news sub-sample, the lower the returns (i.e., more away from zero), the lower (i.e., more earnings-decreasing) the aggregate accruals. This result is likely due to the difference in special items (*SPEC*). The more positive the returns, the lower (i.e., more earnings *de*creasing) the special items (*SPEC*) in the good news sub-sample and, similarly, the more negative the returns the lower (i.e., again more earnings *de*creasing) the special items (*SPEC*) in the bad news sub-sample. Such behaviour of aggregate accruals in general and *SPEC* in particular is consistent with the idea of earnings management, whereby accruals show the tendency to (slightly) decrease earnings in the good news sub-sample, presumably to smooth earnings over the years.

Table 4-5: Pearson's bivariate correlation coefficients for the contemporaneous sample split by the sign of market news, 1969-2001

	OCF	*OP*	*ORD*	*EARN*	*ΔWCAP*	*ΔDebtors*	*ΔStocks*	*ΔCreditors*	*DEP*	*SPEC*	*Accruals (tot.)*	$RET_{t,t-1}$
	GOOD NEWS ($RET_{t,t-1}$>0, *n*=11,433)											
OCF		0.671	0.538	0.407	-0.413	-0.089	-0.131	-0.154	-0.613	-0.158	-0.649	0.183
OP	0.578		0.860	0.721	0.343	0.262	0.350	-0.227	-0.476	-0.152	0.061	0.241
ORD	0.307	0.795		0.857	0.295	0.212	0.307	-0.189	-0.304	-0.042	0.124	0.250
EARN	0.159	0.622	0.824		0.287	0.193	0.295	-0.169	-0.206	0.379	0.302	0.207
ΔWCAP	-0.495	0.355	0.387	0.375		0.473	0.608	-0.082	-0.069	-0.019	0.834	0.053
ΔDebtors	-0.144	0.302	0.275	0.249	0.518		0.306	-0.711	-0.131	-0.034	0.348	0.071
ΔStocks	-0.227	0.355	0.362	0.332	0.660	0.323		-0.574	-0.083	-0.045	0.479	0.069
ΔCreditors	-0.110	-0.265	-0.219	-0.180	-0.155	-0.716	-0.574		0.123	0.050	*-0.007*	-0.073
DEP	-0.583	-0.338	-0.067	0.026	0.021	-0.069	-0.030	0.106		0.132	0.371	-0.122
SPEC	-0.133	0.012	0.136	0.632	0.117	0.050	0.085	*-0.015*	0.127		0.385	-0.050
Accruals (tot.)	-0.644	0.168	0.334	0.541	0.843	0.405	0.544	-0.091	0.412	0.509		*-0.018*
$RET_{t,t-1}$	0.111	0.194	0.267	0.274	0.062	0.082	0.038	-0.052	-0.051	0.109	0.072	
	BAD NEWS ($RET_{t,t-1}$≤0, *n*=14,455)											

Notes. Pearson's bivariate correlation coefficients for good news- (bad news-) only observations above (below) the diagonal. *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock , *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and the measure of total accruals is *Accruals* (*tot.*)= *ΔWCAP+DEP+SPEC.* All variables are per share and scaled by P_{t-1}, returns variable is defined as $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$.All coefficients are statistically significant at the 1% level, except the italicised coefficients. The exact level of significance of the coefficient between $RET_{t,t-1}$ and *Accruals* is $\alpha = 0.029$.

The difference in the role accruals have in earnings formation for good/bad news firms can also be seen from the following relations: *EARN* is more strongly correlated with *OCF* than with *Accruals* (*tot.*) for the good news sub-sample. This relation holds for every component of aggregate accruals. Conversely, for the bad news sub-sample, *EARN* is more strongly correlated with *Accruals* (*tot.*) than with *OCF*. Again, this relation holds for every component of aggregate accruals except the depreciation charge (*DEP*). This is consistent with bad news being reflected in accruals and with the notion that accounting conservatism is an accruals phenomenon.

4.4 PERSISTENCE OF EARNINGS AND EARNINGS COMPONENTS

Under ex-post conservative accounting, bad news must be recognised in earnings immediately and completely in capitalised amounts. The particular accounting item (an earnings figure or an earnings component item) that reflects a given bad news is expected to be large and transitory – i.e., less persistent. The converse holds for good news. The accounting item that reflects a given good news is expected to be relatively small and permanent – i.e., more persistent. Since only a fraction of current good news will be recognised in current earnings or earnings' components, the rest will be gradually (and in relatively small amounts) recognised in future periods' earnings (or earnings component), making current earnings less timely.[52]

Due to the problems related to scale presented in section 2.3.2, the persistence of earnings and main earnings components is empirically tested by estimating the following empirical equivalent of the model presented in section 3.2. This empirical form has been used, among others, by Basu (1997) and Penman (1992):

$$\frac{\Delta X_t}{P_{t-1}} = \pi_1 + \pi_2 C_{t-1} + \omega_1 \frac{\Delta X_{t-1}}{P_{t-2}} + \omega_2 C_{t-1} \frac{\Delta X_{t-1}}{P_{t-2}} + \eta_t \qquad (4\text{-}5)$$

where X is, generally, an undeflated per share accounting figure (earnings, operating cash flows or accruals and accruals' components) and C_{t-1} is an indicator variable taking the value of one if $\Delta X_{t-1} \leq 0$ and zero otherwise. If a time-series of a deflated, per share accounting item ($\Delta X_t / P_{t-1}$) follows a random walk, then $E[\hat{\omega}_1] = 0$ – a positive change in X is expected to repeat itself in future periods. If, on the other hand, a time-series of a deflated, per share accounting item ($\Delta X_t / P_{t-1}$) mean-reverts, then the expected value of the estimated $\hat{\omega}_1$ coefficient is expected to be in the interval $-0.50 \leq E[\hat{\omega}_1] < 0$. Expected values of estimated parameters $\hat{\pi}_1$ and $\hat{\pi}_2$ are both zero $E[\hat{\pi}_1] = E[\hat{\pi}_2] = 0$. The estimated parameter $\hat{\omega}_2$ captures the differential persistence of negative lagged changes ($\Delta X_{t-1} / P_{t-2}$) and the total persistence of negative lagged changes is given by the sum of the two slope coefficients ($\hat{\omega}_1 + \hat{\omega}_2$).

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[52] Recall that timeliness of earnings relates to the extent that *current* earnings reflect value-relevant information (e.g., Beekes, Pope and Young, 2003).

Given the sign convention described in section 4.2, negative values of ΔX_{t-1} (or, equally, ΔX_t) indicate an earnings-decreasing change and positive values an earnings-increasing change in X. Firm-specific subscripts in equation (4-5) are omitted for parsimony.

Based on Section 3.2.2 and existing literature, the following total and partial coefficient values on empirical variables X, presented in Table 4-6 are expected. The table shows a summary of the predictions of the persistence hypothesis (H_1). The expected values in Table 4-6 may also serve as hypothesized figures against which the estimated coefficients are tested. Given that for each of the main accounting (dependent) variables used in this study, there are four panels and for each panel there are 33 yearly cross sections and for each of these cross sections $\hat{\omega}_1$, $\hat{\omega}_2$ and the total coefficient on bad news $(\hat{\omega}_1 + \hat{\omega}_2)$, a large number of estimated regression coefficients must be evaluated against the null hypothesis presented above in Table 4-6. While these test results are omitted from the main results table below for reasons of tractability of exposition, they are presented in full in Appendix E, Table E-1. The table shows the number of times (years) within each dependent variable, each partition and each year the estimated regression coefficient or their linear combination equals to the expected value.[53] Some of the more interesting results are commented below in appropriate sections.

[53] Unfortunately, the available test from the econometric package used only allows testing for strict equalities. Testing for inequaltities would provide more helpful for certain accruals components, but would be very challenging in terms of collecting such a large number of estimated regression coefficients. This also represents an additional reason why the tests are not presented in the main body of this thesis but in the appendix. The weakness of such a test or rather a presentation of a large number of tests are acknowledged.

Table 4-6: Expected values of the coefficients based on estimated persistence models

Empirical variable X_t		$E[\hat{\omega}_1]$	$E[\hat{\omega}_2]$	$E[\hat{\omega}_1+\hat{\omega}_2]$
OCF	No Partition	-0.50 (-0.35)		
	All partitions	-0.50 (-0.35)	0.00	-0.50 (-0.35)
OP, ORD, EARN	No Partition	0.00		
	All partitions	0.00	-0.50	-0.50
ΔWCAP, ΔDebtors, ΔStock, ΔCreditors	No Partition	-0.50		
	All partitions	> -0.50	< 0.00	-0.50
DEP	No Partition	0.00		
	All partitions	0.00	0.00	0.00
SPEC	No Partition	-0.50		
	All partitions	> -0.50	< 0.00	-0.50

Notes. *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock, *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items.

Sources: Dechow, Kothari and Watts, 1998; Lo and Elgers, 1994.

Each panel within Table 4-7 shows the results of estimating regression in equation (4-5) using one of the earnings or earnings-component variables. Within each panel, four partitions are shown, with the purpose of showing differential behaviour of positive and negative changes in deflated, per share accounting variables. Moreover, these partitions provide comparability with Basu's (1997, Table 3) and other results. The partitions are the following:[54]

- no partition (restricted versions of (4-5)),
- results partitioned by the sign of the lagged change in each accounting item $\Delta X_{t-1}=X_{t-1}-X_{t-2}$ and the dummy defined as $C_{t-1}=\{1 \text{ if } \Delta X_{t-1}\leq 0; \text{ zero otherwise}\}$,

[54] Other partitions are possible. For example, Freeman (1987) separates good and bad news firms by the change in the return on equity (*ΔROE*).

- results partitioned by the sign of the lagged level of earnings after extraordinary and exceptional items (*EARN*) and the dummy defined as C_{t-1}= {1 if $EARN_{t-1} \leq 0$; zero otherwise} (also see Hayn, 1995; Jan and Ou, 1995);
- results partitioned by the sign of lagged returns $RET_{t-1,t-2}$ and the dummy defined as C_{t-1}= {1 if $RET_{t-1,t-2} \leq 0$; zero otherwise}. It must be noted that the returns variable is defined differently for the use in this section compared to the rest of the text to maintain deflator comparability with other partitions: $RET_{t-1,t-2} = (P_{t-1} - P_{t-2})/P_{t-2}$.

All variables used are per share and scaled by opening price (either by P_{t-1} or by P_{t-2}). All results are cross-sectional averages of parameters estimated for year t, t= 1969...2001, and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure: for each year, each dependent variables' changes and each partition, the regressions are estimated annually and inferences are made on the basis of the time series of parameters resulting from the cross-sectional regressions (Kothari, 2001). It is acknowledged that other deflators in (4-5) instead of the opening prices might be used – for example, Fama and French (2000) use current period book value of total assets, rather than the lagged value and the open question remains as to whether the entire regression equation should be deflated by the same variable.

The samples used in analyses in this section are sub-samples of the main contemporaneous sample. In addition to restrictions placed on the data to arrive at the contemporaneous sample, two additional restrictions are placed on the values the two deflated variables ($\Delta X_t/P_{t-1}$) and ($\Delta X_{t-1}/P_{t-2}$) can take by removing the top and bottom one percentile on individual distributions of $(\Delta X_t/P_{t-1})$ and $(\Delta X_{t-1}/P_{t-2})$. It was decided to place these additional restrictions after detailed inspection of the data revealed a significant number of observations that were clearly outliers even after the restrictions applied in forming the contemporaneous sample were used. These additional restrictions are, however, done on a variable-by-variable case and not simultaneously. While this is a discretionary decision, removing outliers simultaneously would mean excluding too many observations and there was concern about the effects such restrictions might have on the overall conclusions.[55] In particular, applying too severe restrictions might result in significant survivorship-bias issues.

The empirical results are presented in Table 4-7. Each panel in the table corresponds to an accounting figure and within each panel four partitions described above are presented. The discussion is by main groups of earnings and earnings components.

Operating cash flows. Panel A of shows that, on average, operating cash flows (*OCF*) are strongly mean-reverting – i.e., cash outflows are followed by cash inflows and vice versa. For example, increased sales increase the need for additional net working capital investment, thereby causing cash outflows that are followed in the next accounting period by cash inflows as receivables are collected, inventories liquidated and creditors repaid (Dechow, Kothari and Watts, 1998). The converse

[55] For example, in the case of changes in earnings after extraordinary and exceptional items $\Delta EARN$, different outliers-removal rules would mean: without individual top/bottom one percentile filters on $(\Delta EARN_t/P_{t-1})$ and $(\Delta EARN_{t-1}/P_{t-2})$ the average number of observations per year would have been 784.5; by applying individual filters on $\Delta EARN_t$ and $\Delta EARN_{t-1}$ as well as the main (pooled) filter 695.5 (as is); by applying the main (pooled) as well as all individual filters on $(\Delta X_t/P_{t-1})$ and $(\Delta X_{t-1}/P_{t-2})$ 524.1. There would also have been significant effects on the descriptives of $(\Delta X_t/P_{t-1})$ and $(\Delta X_{t-1}/P_{t-2})$, in particular the dispersion measures.

holds for sales decreases. Therefore, both *OCF* increases and decreases should not persist. In the ΔOCF_{t-1}-partition, s expected, the estimated parameter $\hat{\omega}_1$ indicates that the time series of earnings-increasing $\Delta OCF_t>0$ is mean-reverting, on average. Moreover, there is no asymmetry in operating cash flow reversals – the estimated parameter $\hat{\omega}_2$ is statistically insignificant, indicating that both positive and negative ΔOCF_t mean-revert equally quickly. An exception is a mild asymmetric speed with which earnings-decreasing changes in ΔOCF mean-revert (lagged returns partition) when the observations are partitioned by lagged returns (economic news) ($RET_{t-1,t-2}$). The parameter $\hat{\omega}_1$ and, in partitioned results, the sum $(\hat{\omega}_1 + \hat{\omega}_2)$, is analogous to Dechow, Kothari and Watts (1998) average of first-order autocorrelation coefficients $corr(\Delta OCF_t, \Delta OCF_{t-1})$. The results presented here show that they are close to their theoretical prediction (–0.350), given their assumptions and the role the accruals have in their model. Details of the test of this expectation presented in Table C-1 show that, on average, the $\hat{\omega}_1 = -0.350$ in 22 out of 33 individual years. When partitioning by the sign of news, the number falls to approximately half of the years (either 15 or 18), which is expected given the magnitudes of these estimated regression coefficients. However, when the total persistence of negative *OCF* is considered, in 20/33 years the estimated regression coefficient $(\hat{\omega}_1 + \hat{\omega}_2)$ equals –0.350. The other two partitions give similar results.

To check further the results on (operating) cash flows, Appendix F (Table F-2) shows the results of estimating (4-5) using an accounting variable that is presumably least "affected" by accruals components. Because the net change in cash ($\Delta CASH$) is affected less by the "profit-spread effect" given that the item is affected by all other segments of a firm's operations and finances (e.g., loan repayments), it should revert even faster, as is indicated above in Table 4-6. As the table in the appendices shows, using either partition to separate good and bad news, the estimated $\hat{\omega}_1$ coefficient is reliably higher than for the operating cash flows (*OCF*). Moreover, there is no asymmetry in reversals for earnings-increasing changes in $\Delta CASH$ compared to earnings-decreasing changes in the variable. The exception is, as with the operating cash flows, the partition by $RET_{t-1,t-2}$, which indicates that for bad news firms, cash flows revert faster to the norm than for good news firms. Perhaps the fact that the estimated incremental coefficients $\hat{\omega}_2$ in all three partitions for both the *OCF* and $\Delta CASH$ regressions are negative (albeit in two out of three cases insignificant) can be taken as a mild indication bad news firms must revert operations and financing activities back to the norm faster than would otherwise be required or expected. This might be due to "loss factors" presented in sections 2.2.4 and 4.8.1.

Table 4-7: Persistence of earnings and earnings components, 1969-2001

PANEL A: Operating cash flows (*OCF*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	565.2	**0.042**		**-0.345**		**0.143**
		3.182		-12.046		10.819
ΔOCF_{t-1} partition	565.2	**0.014**	0.075	**-0.305**	-0.001	**0.182**
		2.096	1.458	-9.145	-0.013	7.098
$EARN_{t-1}$-level partition	565.2	**0.043**	0.033	**-0.332**	-0.107	**0.164**
		3.299	1.585	-12.660	-1.074	11.854
$RET_{t-1,t-2}$ partition	565.2	**0.061**	**-0.230**	**-0.260**	**-0.230**	**0.168**
		3.324	-6.353	-11.318	-6.353	10.812

PANEL B: Operating profit (*OP*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	695.5	**0.021**		**-0.058**		**0.025**
		4.481		-2.594		2.427
ΔOP_{t-1} partition	695.5	**0.013**	**-0.013**	**0.063**	**-0.503**	**0.073**
		3.619	-4.489	2.996	-9.711	5.626
$EARN_{t-1}$-level partition	695.5	**0.012**	**0.064**	0.033	**-0.271**	**0.088**
		2.602	7.839	1.822	-6.226	7.259
$RET_{t-1,t-2}$ partition	695.5	**0.020**	0.002	0.009	**-0.183**	**0.042**
		4.751	0.341	0.400	-6.139	3.795

Cont.

PANEL C: Ordinary earnings (*ORD*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	696.3	**0.011**		**-0.067**		**0.026**
		3.881		-2.925		2.589
ΔORD_{t-1} partition	696.3	**0.005**	**-0.013**	**0.101**	**-0.690**	**0.103**
		2.063	-5.655	4.613	-11.750	8.593
$EARN_{t-1}$-level partition	696.3	0.004	**0.054**	**0.046**	**-0.312**	**0.113**
		1.409	9.036	2.294	-4.972	9.152
$RET_{t-1,t-2}$ partition	696.3	**0.010**	0.004	0.029	**-0.233**	**0.050**
		3.594	0.991	1.347	-7.103	4.146

PANEL D: Earnings after extraordinary and exceptional items (*EARN*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	695.5	**0.013**		**-0.234**		**0.077**
		3.409		-7.307		8.571
$\Delta EARN_{t-1}$ partition	695.5	0.002	**-0.020**	-0.054	**-0.696**	**0.177**
		0.717	-7.002	-1.529	-9.681	11.641
$EARN_{t-1}$-level partition	695.5	-0.003	**0.094**	**-0.069**	**-0.397**	**0.215**
		-0.885	4.162	-2.739	-3.460	13.474
$RET_{t-1,t-2}$ partition	695.5	**0.013**	0.001	**-0.121**	**-0.300**	**0.112**
		3.977	0.137	-4.003	-6.521	9.454

PANEL E: Working capital accruals ($\Delta WCAP$)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	695.3	0.007		**-0.407**		**0.178**
		0.833		-20.117		19.800
$\Delta(\Delta WCAP_{t-1})$-partition	695.3	**-0.015**	**0.027**	**-0.296**	**-0.147**	**0.196**
		-2.183	5.790	-6.964	-2.362	20.270
$EARN_{t-1}$-level partition	695.3	0.002	0.015	**-0.390**	**-0.118**	**0.194**
		0.279	0.814	-19.190	-2.206	19.249
$RET_{t-1,t-2}$ partition	695.3	**0.018**	-0.020	**-0.337**	**-0.204**	**0.205**
		2.955	-1.912	-19.212	-8.873	15.002

PANEL E-1: $\Delta WCAP$ component – $\Delta Debtors$	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	692.6	0.011		**-0.423**		**0.199**
		1.550		-17.369		9.635
$\Delta(\Delta Debtors_{t-1})$-partition	692.6	-0.007	**0.022**	**-0.344**	**-0.117**	**0.215**
		-0.881	4.989	-9.498	-2.969	10.833
$EARN_{t-1}$-level partition	692.6	0.008	0.003	**-0.417**	-0.099	**0.210**
		1.182	0.175	-17.444	-1.167	10.429
$RET_{t-1,t-2}$ partition	692.6	**0.019**	-0.007	**-0.353**	**-0.220**	**0.229**
		3.502	-0.475	-16.240	-7.081	8.650

PANEL E-2: $\Delta WCAP$ component – $\Delta Stock$	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	693.3	0.010		**-0.392**		**0.174**
		1.318		-11.608		6.633
$\Delta(\Delta Stock_{t-1})$-partition	693.3	-0.004	0.003	**-0.334**	-0.152	**0.199**
		-0.643	0.222	-6.986	-1.847	7.293
$EARN_{t-1}$-level partition	693.3	0.008	0.014	**-0.380**	-0.151	**0.187**
		1.075	1.184	-10.567	-1.234	7.010
$RET_{t-1,t-2}$ partition	693.3	**0.021**	**-0.023**	**-0.339**	**-0.181**	**0.196**
		3.630	-2.993	-9.429	-6.403	7.493

Cont.

PANEL E-3: *ΔWCAP* component – *ΔCreditors*	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	692.5	**-0.015**		**-0.451**		**0.203**
		-2.108		**-15.881**		**14.101**
$\Delta(\Delta Creditors_{t-1})$-partition	692.5	**-0.036**	**0.034**	**-0.415**	-0.002	**0.222**
		-2.626	**2.956**	**-14.515**	-0.039	**11.812**
$EARN_{t-1}$-level partition	692.5	**-0.015**	0.017	**-0.440**	-0.061	**0.213**
		-2.090	1.067	**-15.206**	-1.211	**14.952**
$RET_{t-1,t-2}$ partition	692.5	**-0.024**	0.009	**-0.405**	**-0.153**	**0.225**
		-3.965	0.743	**-14.078**	**-5.288**	**12.548**

PANEL F: Depreciation and amortisation (*DEP*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	701.8	**-0.006**		0.001		**0.005**
		-8.230		0.031		**3.406**
ΔDEP_{t-1} partition	701.8	**-0.006**	0.000	-0.001	0.490	**0.009**
		-9.320	0.137	-0.038	0.274	**6.146**
$EARN_{t-1}$-level partition	701.8	**-0.007**	**0.012**	-0.036	-0.452	**0.055**
		-11.118	**7.485**	-1.424	-1.086	**8.612**
$RET_{t-1,t-2}$ partition	701.8	**-0.006**	**0.002**	-0.024	-0.080	**0.019**
		-10.664	**2.993**	-0.945	-0.344	**5.273**

PANEL G: Special items (*SPEC*)	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	690.4	-0.002		**-0.413**		**0.168**
		-0.839		**-12.246**		**14.450**
$\Delta SPEC_{t-1}$ partition	690.4	**-0.007**	0.001	**-0.288**	**-0.292**	**0.219**
		-3.492	0.733	**-7.178**	**-3.544**	**13.602**
$EARN_{t-1}$-level partition	690.4	**-0.008**	**0.035**	**-0.271**	**-0.422**	**0.251**
		-4.219	**3.336**	**-9.501**	**-4.536**	**12.065**
$RET_{t-1,t-2}$ partition	690.4	-0.003	**0.004**	**-0.256**	**-0.337**	**0.200**
		-1.475	**2.193**	**-10.310**	**-6.262**	**14.450**

Cont.

Notes. Estimated regressions are: $(\Delta X_t/P_{t-1}) = \pi_1 + \pi_2 C_{t-1} + \omega_1(\Delta X_{t-1}/P_{t-2}) + \omega_2 C_{t-1}(\Delta X_{t-1}/P_{t-2}) + \eta_t$ where $\Delta X_t = X_t - X_{t-1}$ and $\Delta X_{t-1} = X_{t-1} - X_{t-2}$ and X_t is an undeflated, per share dependent variable listed at the top of each panel. Dummy variables C_{t-1} are defined as follows: partitioning by ΔX_{t-1}: C_{t-1}={1 if $\Delta X_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged level of earnings after extraordinary and exceptional items $EARN_{t-1}$: C_{t-1}={1 if $EARN_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged returns $RET_{t-1,t-2}$:C_{t-1}={1 if $RET_{t-1,t-2} \leq 0$; 0 otherwise}. All variables are deflated either by P_{t-1} or by P_{t-2}. All estimates are cross-sectional averages for the period t=1969-2001 and associated t- statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f. Values are restricted to top/bottom 1% of distribution of variables used in the contemporaneous sample as well as to top/bottom 1% of distribution of relevant deflated change variables $\Delta X_t/P_{t-1}$ and $\Delta X_{t-1}/P_{t-2}$ (i.e., the samples used in this table are sub-samples of the contemporaneous sample).

Earnings. Operating profit *OP* (Panel B), ordinary earnings *ORD* (Panel C) and earnings after extraordinary and exceptional items *EARN* (Panel D) appear to deviate, on average, from the expected random walk (i.e., they mildly mean-revert) (e.g., Brooks and Buckmaster, 1976), since in all three cases the estimated regression coefficient $\hat{\omega}_1$ is below zero when the regressions are not partitioned according to different measures of bad news. The coefficient equals zero in 31 out of 33 years (see Table E-1 in appendices). However, this deviation from the expected random walk is mostly due to negative changes in the three earnings figures, consistent with negative earnings changes and levels being transitory and reversed in the next (or next few) accounting period(s). Separating the change in *EARN* by the sign of the change, reveals that positive *EARN*-changes follow the random walk overall and that the total coefficient on negative changes ($\hat{\omega}_1 + \hat{\omega}_2$) equals –0.500 in 27 out of 33 years, i.e., earnings-decreases fully mean-revert within one accounting period in 27/33 years, consistent with expectations.

Changes in the earnings variables *OP* and *ORD*, show a slight tendency to mean-revert on average. The estimated coefficient in the "No partition" section is slightly below zero $\hat{\omega}_1 < 0$. In both cases the coefficient is statistically significant. However in 18 and 20 out of 33 years in the *OP* and *ORD* sections respectively the coefficient is insignificantly different from zero. As for the *EARN* figure, once the changes in *EARN* are partitioned by the sign of the change, $\hat{\omega}_1$ becomes statistically insignificantly different from zero – the time-series of positive changes in operating profit and ordinary earnings follow a random walk (albeit there are some unexpected deviations), while negative changes exhibit, depending on the partition, relatively high mean-reverting rates, given the magnitude and high statistical significance of the $\hat{\omega}_2$ coefficients in all three partitions within both panels. This finding is consistent with expectations under ex-post conservative accounting, where earnings decreases are predicted to be (more) transitory, while earnings increases are predicted to be (more) permanent.

Also, the more extraordinary/exceptional items earnings contain, the more mean-reverting the time series of earnings should be by definition of these items: on average therefore (i.e., without partitioning), *EARN* should reverse fastest, given that it presumably contains the most transitory items of all earnings figures, followed by *ORD* and by *OP*. The estimated coefficients $\hat{\omega}_1$ are in fact increasing in magnitude across the three earnings definitions $\hat{\omega}_{1,OP} < \hat{\omega}_{1,ORD} < \hat{\omega}_{1,EARN}$. In particular, the magnitude of the coefficient $\hat{\omega}_{1,EARN}$ is almost four times the $\hat{\omega}_{1,ORD}$. Partitions by the sign of the changes in these variables again show that, in absolute value, $\hat{\omega}_{2,OP} < \hat{\omega}_{2,ORD} < \hat{\omega}_{2,EARN}$, which is to be expected if *EARN* contain most one-off items of the three earnings figures. In total terms, the coefficients of the three earnings variables increase in the absolute sense from *OP* to *ORD* to *EARN* (–0.440, –0.589 and –0.750 respectively). Also, this is consistent with the presence of transitory items at both extremes of earnings figures, not just the negative side. Finally, partitioning by lagged $EARN_{t-1}$-level or lagged $RET_{t-1,t-2}$ produces qualitatively similar, but weaker results, indicating a random walk behaviour of earnings for the good news firms and mean-reversion of earnings for bad news firms. In terms of differences regarding the three measures that are used to separate good and bad news firms, it must be noted that similar differences in partitions are reported already by Basu (1997).

Albeit these results are somewhat different, the essential findings are very similar to Fama and French (2000). They find that a) book profitability (return on assets) is mean-reverting; b) the rate of reversal is 38% per year; c) the rate of reversion is higher when profitability is farther away from the mean; and d) that the reversal is faster when profitability is below the mean rather than above the mean. This evidence is in major part consistent with the findings presented in this study in Table 4-7 above, albeit the method differs somewhat from theirs.

Figure 4-2 depicts a simplified version of these findings, both in the levels specification, and, as presented above in Table 4-7, in the corresponding changes specification. In the figure, it is assumed that a random walk series of permanent earnings (dark blue line) is occasionally interrupted by a purely mean-reverting series of "special items" (red line) to obtain the published earnings figure (green line), which may either be a profit or a loss.[56] The (positive) permanent earnings itself may fluctuate for reasons other than "special items" – for example, the underlying operating cash flows might fluctuate. Accordingly, the representation of (positive) permanent earnings is not a straight line, but it fluctuates randomly. However, the line is constructed so that it follows a random walk over time (i.e., the parameter $\omega_1 = 1$ in the levels specification, and $\omega_1 = 0$ in the changes specification of, for example, equation (3-4) from section 3.2.1).[57]

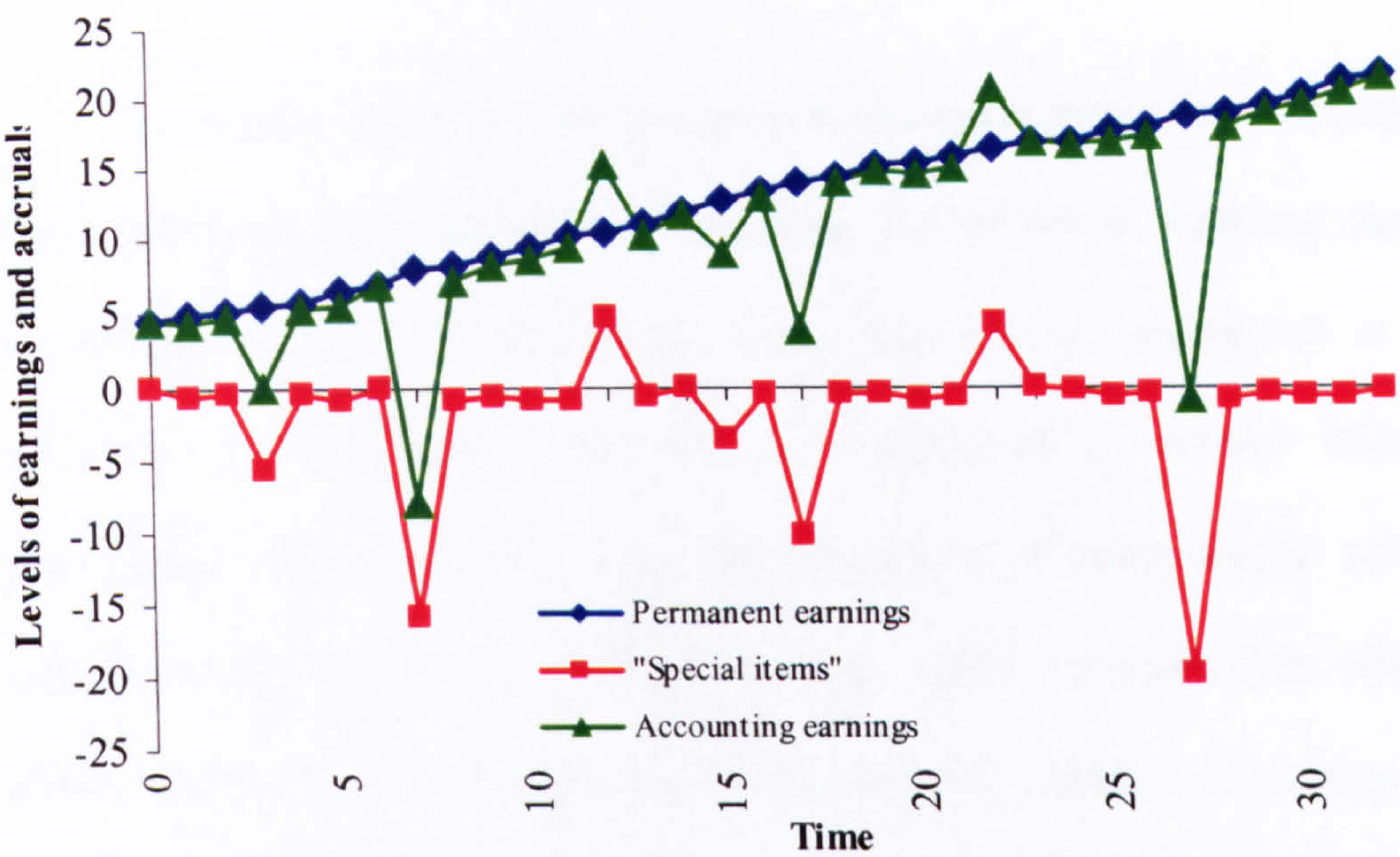
On the contrary, the "special items" figure is constructed so that it is completely mean-reverting (i.e., the parameter $\omega_1 = 0$ in the levels specification, and $\omega_1 = -0.5$ in the changes specification). Note that, consistent with the presentation in section 4.3 and in particular Figure 4-1, the "special items" are allowed to be positive, on occasion. In most years, however, they equal zero, as would be expected under their theoretical definition. Moreover, the estimated parameter $\hat{\omega}_1$ for the *SPEC* variable equals -0.50 in the changes specification in 22 out of 33 individual years. The two figures combine to obtain published accounting earnings figure.

[56] The term "special items" is in inverted quotes to distinguish it from the actual definiton, albeit it resembles closely the empirical findings.

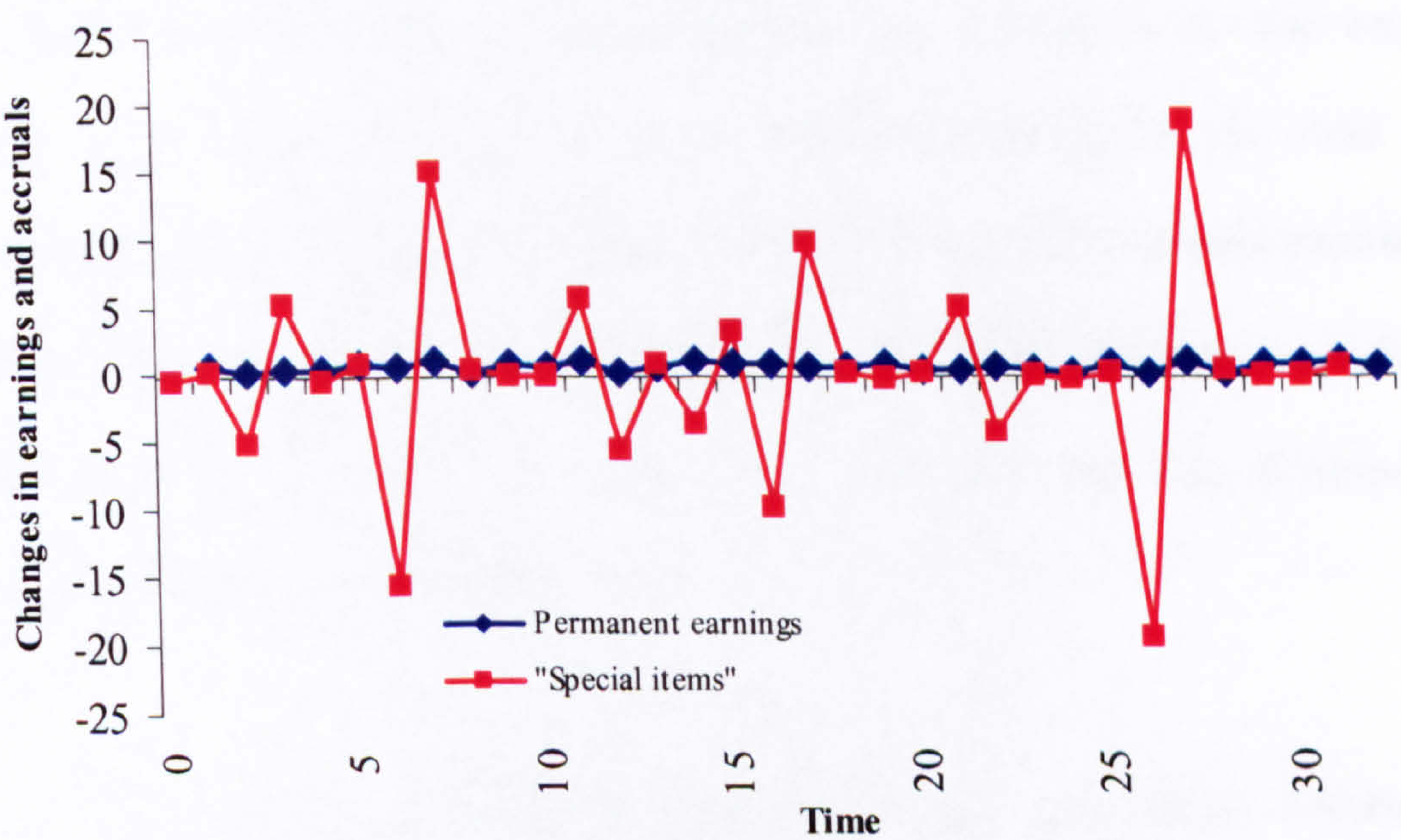
[57] Also, such a graphical representation shows that earnings-levels is clearly a non-stationary series, providing a motivation to empirically estimate the these processes in the changes specification (also see section 3.2.1)

Figure 4-2: Earnings-levels and earnings-changes in a time-series perspective – an idealised representation

Panel A: Levels illustration



Panel B: Changes illustration



Notes to Figure 4-2: In Panel B, the published accounting earnings (corresponding to the green line in Panel A) is not shown for clarity of representation. Dark blue line represents (positive) permanent earnings, red line the mean-reverting "special items" and the green line the published accounting earnings.

Also important for the discussion on losses in section 4.8, is the observation that extreme negative "special items" may, but not necessarily will, cause a firm to report an accounting loss. Moreover, reported losses can vary in magnitude depending on the relative sizes of permanent earnings and "special items". Thus, a theory of losses that would encompass both underlying processes as well as positive and negative accounting earnings would be required.

Accruals. The difference in (asymmetric) persistence between operating cash flows and earnings is attributed to accruals. For example, working capital accruals smooth changes in operating cash flows due to net investment in receivables, inventory and payables. Since these are expected to reverse within the next accounting period, the time series of changes in working capital accruals should reverse strongly. The reversion of working capital accruals then offsets negative serial correlation in operating cash flows to produce smoother earnings. The results shown in Panels E-G (with the exception of Panel F – *DEP*) are consistent with these expectations. Given their assumptions, these rates of reversals are also very close to Dechow, Kothari and Watts' (1998) theoretical prediction for total operating accruals, where the expected value of the coefficient on earnings-increasing changes in this type of accruals is $E[\hat{\omega}_1] = -0.500$. Since accruals are expected to fully mean-revert within one period, the first-order correlation of the first differences should equal –0.500 (Beaver, 1970).

On average, *ΔWCAP* and its three main components reverse quickly. Earnings-decreasing changes in *ΔWCAP* and *ΔDebtors* reverse quicker than earnings-increasing changes in these variables, i.e., bad news firms' accruals revert faster to the mean. This is consistent with conservative accounting. It is also consistent with a result presented later in section 4.5 – that some of the bad news is capitalised in working capital accruals more timely than good news, making them less persistent than good news. It is, however, inconsistent with Basu's (1997) notion that working capital accruals should reflect good and bad news equally timely. Earnings-increasing and earnings-decreasing changes *$\Delta Stock$* and *$\Delta Creditors$* reverse equally quickly, in statistical terms, but there is some indication that in both cases earnings-decreasing changes reverse quicker: the partition by the sign of news ($RET_{t-1,t-2}$) is statistically significant and in the case of *$\Delta Stock$* partitioning by the sign of *$\Delta Stock$* is significant at the 10% level. A degree of asymmetry in *$\Delta(\Delta Stock)$* is to be expected, given that assets should generally not be shown at amounts higher than the recoverable amount. In the case of stock, SSAP 9 (*Revised*): *Stocks and Long-term Contracts* be shown at:

> "...the total of the lower of cost and net realisable value of the separate items of stock or of groups of similar items." (quoted in Davies, Patersonand Wilson, 1999, p. 978).

Results for depreciation and amortisation expense (Panel F) are consistent with *DEP* following a random walk, regardless of the sign of the change in *DEP*, i.e., the change is symmetric – both increases in depreciation charge and decreases are permanent. Assuming a firm in a steady state with no net growth in fixed assets, where all investment are replacement investments financed by depreciation and amortisation funds, then $E[\Delta DEP]= 0$.

Given the scarcity of empirical guidance to the time-series behaviour of depreciation and amortisation charge and the importance of limited useful economic lives of fixed assets in practice, it is useful to compare the results obtained in this research with expectations resulting from application of accounting standards. Depreciation is defined in FRS 15: *Tangible Fixed Assets* as

"...the measure of the cost or revalued amount of the economic benefits of the tangible fixed assets that have been consumed during the period." (quoted in Davies, Paterson and Wilson, 1999, p. 747; and Robins, 1999, p. 3)

Amortisation is the equivalent term of depreciation for intangible assets, but it is not explicitly defined in the appropriate standard – FRS 10: *Goodwill and intangible assets* (Davies, Paterson and Wilson, 1999).

Regarding the time-series properties of depreciation, the following points are important. First, the standard notes that the straight line method should be adopted in cases where the pattern of consumption of economic benefits in uncertain (Robins, 1999). This indicates that over the life of a fixed asset and other things being equal, the same charge will be applied in all accounting periods and the depreciation charge will not change in subsequent periods so that $E[\Delta DEP]= 0$. Second, the depreciation is calculated on the carrying value that depends on three factors: cost (or re-valued amount), estimated economic life and residual value (Elliott and Elliott, 2004). If any of these factors change, then the depreciation charge will also change in that particular year, but it will remain at the same level in subsequent accounting periods so that again $E[\Delta DEP]= 0$.[58] Third, and related, even before the introduction of FRS 11: *Impairment of Fixed Assets and Goodwill* companies were carrying fixed assets at no more than their recoverable amounts. If an asset is impaired, its carrying value is to be written down to net recoverable amount, which is the higher of net realisable value and the value in use. Further, the impairment loss is to be measured and recognised on a consistent basis (Davies, Paterson and Wilson, 1999, pp. 784-812). Therefore, once an impairment loss is recognised, the carrying value is

[58] The exact timing of these effects showing up in the accounts may differ from this perhaps oversimplified, example. Robins (1999, p. 4) provides some illustrations of these cases.

reduced, followed by a reduction in the depreciation charge. Once this reduction is accounted for, there are no further adjustments and again $E[\Delta DEP]= 0$. A final point potentially important for subsequent sections of this research is that at least two impairment indicators are directly related to changes in market values which are used as a proxy for economic news: a significant decline in fixed asset's market value and a significant increase of market rates of return (effectively the discount rates) that are likely to affect the asset's recoverable amount. Moreover, the importance of (the growth of) the depreciation charge has been shown to be negatively correlated with one period ahead earnings (Ou, 1990). This might be important in that via the theoretical links between future earnings and future dividends, the depreciation charge may be informative about future cash flows.

While it is difficult to form exact expectations about the time-series behaviour of special items *SPEC* (Panel G) nonetheless because, as follows from its definition, it is a collection of potentially very dissimilar items (see, for example, Elliott and Shaw, 1988, p. 94, possibly including some non-operating cash flow components), empirical literature (e.g., Das and Lev, 1994) suggest that these items should be the most transitory type of accruals or the most transitory earnings component (Burgstahler, Jiambalvo and Shevlin, 2002; Elliott and Hanna, 1996; Elliott and Shaw, 1988). Since the definition of *SPEC* used in this study ensures that any tax, interest, minorities and preference dividends' accruals as well as cash flows resulting from these items are excluded, to the extent possible, from *SPEC*, these items should contain mostly one-time items like losses and profits on disposals, losses and profits on termination of operations, costs of restructurings and reorganisations (e.g., Gore, Pope and Singh, 2001, endnote 10), i.e., items that are expected to appear in financial statements only once and in one accounting period. Their effects should then reverse. Note that the median of deflated special items in the contemporaneous sample is exactly 0.000 and the mean –0.011 (also see other descriptive data in Table 4-1), suggesting that inclusions of one-time gains, not only one-time losses, are also relatively frequent. Also, these results are somewhat in contrast to Elliott and Hanna (1996) who report that 27% of US firms reporting a large write-off in one period will report another large write-off in the following period, while the results obtained here for the earnings-decreasing changes in *SPEC* suggest almost a full reversal within one period. The results taken as a whole show that special items reverse quickly, similar to reversals of working capital accruals. The estimated coefficient $\hat{\omega}_1$ is reliably negative in 22 out of 33 years. Partitioning by sign of $\Delta SPEC$ reveals that positive (earnings-increasing) $\Delta SPEC$ persist much longer than negative (earnings-decreasing) $\Delta SPEC$ and about the same as positive $\Delta(\Delta WCAP)$. It is also interesting to note that earnings-decreasing $\Delta SPEC$ reverse much quicker if the firm has shown a loss after extraordinary and exceptional items and/or has been hit by bad economic news as proxied for by returns in the previous accounting period t–1.[59]

In additional analyses shown separately in Appendix F (Table F-2), the results for total accruals (*Accruals* (*tot.*)) are presented. As the preceding analysis shows, the persistence behaviour of the three components of *Accruals* (*tot.*) is quite different, especially in terms of asymmetric persistence of earnings-decreasing changes of these components. Thus, on average, total accruals reverse quickly to the

[59] Caution needs to be exercised when studying the tests presented in Appendix C. The theoretical expectations are not in terms of strict equalities, but inequalities, in particular what regards the incremental coefficient $\hat{\omega}_2$.

norm as evidenced by a highly negative $\hat{\omega}_1$ coefficient. The estimated incremental regression coefficients $\hat{\omega}_2$ in all three partitions reveal that earnings-decreasing changes mean-revert quickly. A comparison of the behaviour of individual components with the results on aggregate accruals (*Accruals* (*tot.*)) highlights the need to study the behaviour of these variables separately. Also, accruals in general mean-revert faster (i.e., are less persistent) than operating cash flows (Barth *et al.*, 1999).

As a final note to the persistence models, the results presented above in Table 4-7 might be useful in forming expectations about contemporaneous models of ex-post accounting conservatism. One way of interpreting the decomposition of reported accounting earnings into: a) different earnings measures, b) operating cash flows and c) accruals, is that these variables all represent empirical measures of permanent earnings. Permanent earnings are the theoretical construct modelled in Pope and Walker (1999) and are assumed to follow a random walk. Evidence presented above – in particular, the "No partition" sections – might be viewed as an indicator of the degree to which empirical measures of permanent earnings violate the assumption of random walk within each regression by a different accounting variable presented in subsequent sections.

To summarise, operating cash flows are strongly, but not completely mean-reverting, and there is no asymmetry in reversals of earnings-increasing and decreasing changes. Earnings-decreases overall are strongly mean-reverting, while earnings-increases are permanent. The asymmetry is more pronounced for earnings figures containing more accruals. While accruals on average mean-revert, the rate of reversal is stronger for earnings-decreasing accruals. This holds particularly for working capital accruals and special items, while changes in the depreciation charge are permanent. These results are generally as expected under conservative accounting. There are, however, some interesting deviations from expectations.

4.5 CONTEMPORANEOUS POPE AND WALKER (1999) MODELS OF EX-POST ACCOUNTING CONSERVATISM

4.5.1 Inferences from cross-sectional averages

The results of direct tests of the contemporaneous Pope and Walker (1999) model of ex-post conservatism by different accounting variables are presented in Table 4-8. The leftmost column in the table lists the main components of earnings and different definitions of earnings used. All coefficients' estimates are cross-sectional averages of the estimates of 33 yearly regressions. The *t*-statistics are calculated according to the Fama and MacBeth (1973) method. The second column in Table 4-8 shows the average number of observations. Given the outlier-removal criteria (see section 4.2) the average number of observations is always 784.5 firms per year. The actual number of observations ranges from a minimum of 305 firms in 1969 to a maximum of 1,048 firms in 1998 and 827 firms in year 2001.

The following model is the operationalised version of the general empirical contemporaneous model presented in section 3.3 above:

$$\frac{X_t}{P_{t-1}} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \varepsilon_t \qquad (4\text{-}6)$$

The main parameters that reflect the effects of accounting conservatism in equation (4-6) are the estimated coefficients on good news ($\hat{\beta}_1$) and, in particular, the incremental response of an accounting item to bad news ($\hat{\gamma}_1$). Given that the definitions in terms of the sign of dependent variables varies across different dependent variables, the expected values of the three measures of accounting conservatism that can be derived from the model in equation (4-6) must be considered in absolute values when comparing the magnitudes of these coefficients. Thus, under conservative accounting and assuming a particular accounting variable (earnings, operating cash flow or accruals components) reflects bad news, the expected values of the parameters are as follows: $abs(\hat{\gamma}_1)>0$ for the incremental bad news coefficient, $abs(\hat{\beta}_1+\hat{\gamma}_1)>abs(\hat{\beta}_1)>0$ for the total bad news coefficient and $abs((\hat{\beta}_1+\hat{\gamma}_1)/\hat{\beta}_1))>1$ for the relative total bad news coefficient. For each dependent variable, the models where the α_2 and γ_1 coefficients are restricted to zero are also presented. They represent a base-case scenario to which it is then possible to compare the unrestricted versions of the models (e.g., Giner and Rees, 2001), i.e., analyse the effects of the non-linearity in the accounting figure-returns models introduced in this relation by conservative accounting. If asymmetric timeliness is an important feature of a given accounting figure, then the differences between the R^2s from restricted and unrestricted versions of the model should be significant.

Formally, the test hypothesis of no difference between the restricted and unrestricted versions of contemporaneous models can be stated in the following alternative form (e.g., Baltagi, 1998, pp. 78-81; Gujarati, pp. 266-273):

H^A: At least one of the coefficients $\hat{\alpha}_2$ and $\hat{\gamma}_1$ is different from zero.

The test statistic is

$$F_{m,n-k} = \frac{(R^2_{UR} - R^2_R)/m}{(1 - R^2_{UR})/(n-k)} \qquad (4\text{-}7)$$

where R^2_{UR} and R^2_R denote the R^2s from unrestricted and restricted versions of the models respectively, m is the degrees of freedom in the restricted model and equals to the number of linear restrictions imposed on the unrestricted model, and $(n-k)$ is the number of degrees of freedom in the unrestricted version (the difference between the number of observations in each cross-section for each accounting variable n and the number of independent variables, including the constant, k).[60] The tests for lagged models are straightforward extensions of the above test.

The results of estimation of contemporaneous models are presented in Table 4-8 and are discussed below by groups of dependent variables, operating cash flows, earnings and accruals. For reasons of tractability of presentation, the aggregate results of the formal tests of significance of differences between the restricted and

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[60] Alternative test of differences between restricted and unrestricted versions of the models include the LR, Wald and LM tests. A summary is presented in, for example, Maddala (2001, pp. 116-122 and pp. 176-177). Given that these issues, while yielding important additional insights, are not critical to these tests are not used.

unrestricted versions are presented separately in Appendix G, but are commented on below when deemed necessary.

Operating cash flows. The estimated coefficient on good news ($\hat{\beta}_1$) in the operating cash flows (*OCF*) equation is positive as expected, indicating that part of the current-period good news is settled (realised) in cash and captured by the operating cash flows figure in the current accounting period. Operating cash flows incorporate only current realised economic gains and realised economic losses. They do not incorporate either future (unrealised or anticipated) economic gains or losses. Therefore, asymmetric timeliness should not be observed in operating cash flows in respect to bad news. As either good or bad news is gradually realised over time, its effect is incorporated in operating cash flows on an equally timely basis. The first rows in Table 4-8 confirm this expectation. The incremental coefficient on bad news ($\hat{\gamma}_1$) is not statistically different from zero. Also, there is little difference between the R^2s for the restricted and unrestricted versions of the models. In statistical terms, the difference is significant in 11 out of 33 individual cross-sections, but even where the differences are statistically significant, they appear to be economically marginal. This is taken as yet another indication that asymmetric timeliness does not play an important role in the relation between operating cash flows and returns.

A measure of total cash flows, defined as the net change in cash (*ΔCASH*) was also used as the dependent variable to provide some comparatives with existing literature. For example, Dechow (1994) uses a measure of total cash flows and Basu (1997) attempts to construct a measure of cash flow from operating and investment

Table 4-8: Contemporaneous Pope and Walker (1999) models of ex-post accounting conservatism, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Operating cash flows								
OCF	784.5	**0.222**		**0.108**		**0.051**		
		14.811		**10.871**		**6.973**		
	784.5	**0.227**	0.002	**0.101**	0.046	**0.057**	0.147	1.459
		14.920	0.248	**8.433**	1.724	**8.000**		
Earnings								
OP	784.5	**0.192**		**0.135**		**0.147**		
		10.821		**13.621**		**11.725**		
	784.5	**0.209**	-0.001	**0.100**	**0.139**	**0.163**	0.239	2.381
		11.208	-0.147	**8.169**	**7.157**	**14.430**		
ORD	784.5	**0.086**		**0.086**		**0.172**		
		12.329		**17.510**		**13.259**		
	784.5	**0.099**	0.002	**0.058**	**0.120**	**0.199**	0.178	3.051
		15.072	0.638	**9.637**	**11.194**	**16.295**		
EARN	784.5	**0.078**		**0.097**		**0.140**		
		9.843		**17.820**		**13.048**		
	784.5	**0.095**	0.004	**0.058**	**0.174**	**0.171**	0.232	3.980
		13.836	1.370	**10.327**	**11.958**	**16.426**		
Accruals								
ΔWCAP	784.5	**0.044**		**0.041**		**0.012**		
		4.633		**8.177**		**6.367**		
	784.5	**0.054**	-0.001	**0.017**	**0.084**	**0.018**	0.100	6.065
		5.891	-0.233	**2.140**	**4.090**	**7.642**		
ΔWCAP components:								
- of which *ΔDebtors*	784.5	**0.055**		**0.051**		**0.018**		
		7.057		**11.629**		**10.135**		
	784.5	**0.061**	0.003	**0.034**	**0.082**	**0.023**	0.117	3.410
		8.172	0.813	**6.321**	**3.214**	**10.679**		
- of which *ΔStock*	784.5	**0.049**		**0.044**		**0.016**		
		4.671		**8.486**		**6.924**		
	784.5	**0.056**	-0.001	**0.029**	**0.056**	**0.020**	0.085	2.937
		5.335	-0.317	**4.746**	**3.281**	**8.087**		
- of which *ΔCreditors*	784.5	**-0.060**		**-0.054**		**0.018**		
		-6.850		**-10.458**		**8.094**		
	784.5	**-0.063**	-0.003	**-0.046**	**-0.055**	**0.021**	-0.101	2.173
		-7.281	-0.813	**-7.754**	**-2.310**	**9.360**		
DEP	784.5	**-0.077**		**-0.015**		**0.016**		
		-17.798		**-6.231**		**4.963**		
	784.5	**-0.076**	-0.002	**-0.017**	0.008	**0.020**	-0.010	0.563
		-17.657	-0.795	**-5.548**	1.011	**5.813**		
SPEC	784.5	**-0.009**		0.004		**0.012**		
		-3.843		1.236		**4.913**		
	784.5	-0.004	0.002	**-0.007**	**0.056**	**0.024**	0.049	-6.914
		-1.913	1.853	**-2.107**	**6.957**	**6.182**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1} = (P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1} = \{1$ if $RET_{t,t-1} \leq 0$; 0 otherwise$\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f., i.e., $|t|>2.0369$.

activities. Both of these two cash flow measures provide a measure of firm performance that does not contain accruals. Assuming possible empirical "contaminations" of the cash flows figure with accruals in constructing the *OCF* figure either for the purposes of this research or at the firm level, the *ΔCASH* variable should exhibit even less asymmetry than the *OCF* measure. Results indicate that the bad news incremental coefficient ($\hat{\gamma}_1$) is in fact not statistically different from zero and of the wrong sign ($\hat{\gamma}_1 = -0.049$) and the total coefficient on bad news is $\hat{\beta}_1 + \hat{\gamma}_1 = 0.037$ as compared to 0.147 for the *OCF* measure. Also, the average R^2 from these cross-sectional regressions is very low ($R^2 = 0.025$), lower than the average R^2s in *OCF* regressions ($R^2 = 0.057$) and much lower than for any of the earnings measures employed in this analysis (minimum $R^2 = 0.163$). Moreover, as expected, the differences between the restricted and unrestricted versions of the models are significant in only 5 individual years.

Earnings. All three earnings' measures capture a part of current-period good news, as indicated by positive $\hat{\beta}_1$ coefficients in regressions employing the three earnings measures as dependent variables. The responsiveness of earnings to good news is highest for the *OP* measure, which is consistent with firms' tendency to pass as many of what would otherwise be extraordinary/exceptional gains as possible through "ordinary" earnings figures (i.e., "above the line"). Earnings do not incorporate unrealised (anticipated) economic gains, but they do incorporate unrealised economic losses, resulting thus in a more timely performance measure than cash flows. Much higher average R^2s compared with R^2s from *OCF* (and *ΔCASH*) regressions confirm this. The asymmetric timeliness in respect to bad news should increase from *OP* to *ORD* to *EARN* as progressively more accruals are added to the operating cash flows to arrive at the earnings figures. Presumably, the accruals added from *OP* to *EARN* are increasingly of the more non-operating type and are on average income reducing, reflecting items like write-offs.[61] This is also evidenced from Figure 4-1. This process should also increase the timeliness of various earnings figures and be observed by increasing $\hat{\gamma}_1$ coefficients across the three earnings variables. Consistent with this expectation, the $\hat{\gamma}_1$ coefficient on the *EARN* variable is highest, followed, unexpectedly, by the $\hat{\gamma}_1$ coefficient on *OP* and *ORD*. The relative measures of accounting conservatism $(\hat{\beta}_1 + \hat{\gamma}_1)/\hat{\beta}_1$ do, however, increase from *OP* to *ORD* to *EARN* as expected under conservative accounting (2.381, 3.051 and 3.980 respectively). Also consistent with expectations is the value of the relative conservatism measure for the *OCF* variable compared to the three values on the earnings measures $(\hat{\beta}_1 + \hat{\gamma}_1)/\hat{\beta}_1 = 1.459$, which is sizeably lower than the corresponding measures for the three earnings variables. The average adjusted R^2s drop from *ORD* to *EARN*, consistent with exceptional/extraordinary items being transitory in nature (Pope and Walker, 1999) thus causing a less-strong contemporaneous association between market and accounting values. Finally, to confirm these observed relations, the importance of allowing differences between the restricted and unrestricted versions should increase from *OP* to *ORD* to *EARN* as the asymmetric recognition becomes more and more important. This appears in fact the case (see Appendix G). The numbers of times the differences in R^2s between restricted and unrestricted versions are significant increase across the three measures (23, 27 and 28 of the 33 years in the sample).

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[61] These accruals should be captured by the special items variable *SPEC* by definition. See section 4.2 for the definition of special items *SPEC* and a discussion of the components of these items.

Taking the *ORD* and *EARN* variables from this study, the estimates of the $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients in this study are generally lower than in Pope and Walker (1999) both overall and when relevant sub-periods from their sample are considered (1976-1996, 1976-1992 and 1993-1996) using the sub-sets of data from present samples. One of the possible explanations for these differences is the smaller ranges of both dependent and independent variables used in this study (see the descriptives in section 4.3 and Table C-1 in Appendix C) reflecting thus less extreme economic events, but may also be due to the composition of the sample. In particular, any systematic differences between December and non-December fiscal year ends (section 5.4 presents evidence on these differences), differences in some variable definitions (most notably the earnings figure *EARN*) and others. The tenor of the results and the conclusions remain, however, comparable and essentially convey equal conclusions. Interestingly, for both earnings measures and all three sub-periods, the average R^2s for the relevant sub-period in this study are marginally lower than in Pope and Walker's (1999) study, even though this sample is less extreme than theirs.

Similar conclusions can also be made in respect to Giner and Rees (2001) paper using *EARN* figure for earnings and the 1990-1998 sup-period and the Ball, Kothari and Robin (2000) study using *ORD* earnings figure and the 1985-1995 sub-period. Both good and bad news coefficients are lower, but the average adjusted R^2 is higher in this study. Again, this is likely due to narrower ranges of data used in this study and possibly to systematic differences between December and non-December fiscal-year-end firms.

Accruals. Of the three main groups of accruals used in this study, working capital accruals, *ΔWCAP*, exhibit the highest asymmetric sensitivity to bad news, followed by special items *SPEC* and the depreciation charge *DEP* that is symmetrically sensitive to bad and good news. Overall, *ΔWCAP* capture a higher proportion of bad news than *SPEC*. This is an interesting finding, given that *SPEC*-like variables would usually be discussed in greater detail in related research.

The sign of the bad news coefficient $\hat{\gamma}_1$ in the *ΔWCAP* equation is positive and statistically significant, indicating that bad news (negative returns) is partially reflected in a reduction of net working capital (either debtors and stock accounts decrease or creditors accounts in the balance sheet increase or a combination of both applies). This in turn reduces earnings. The estimated good news coefficient $\hat{\beta}_1$ in the *ΔWCAP* equation is also positive – good news causes stock and debtors accounts to increase and/or creditors' accounts in the balance sheet to decrease resulting in an increase in earnings. This is in contrast with Basu (1997) who argues that

> "...both increases and decreases in gross accounts receivable are reflected quickly in earnings" (p.16)

and that all such accruals should attenuate (bias towards zero) the asymmetric timeliness observed in the earnings figure. Contrary to this expectation, the results in Table 4-8 show that a significant proportion of the asymmetric sensitivity of earnings to contemporaneous bad news is due to working capital accruals. The high value of the relative measure of accounting conservatism highlights the asymmetric timeliness of working capital accruals $(\hat{\beta}_1 + \hat{\gamma}_1)/\hat{\beta}_1 = 6.065$ compared with the coefficient from the *EARN* regression of 3.980.

To investigate this issue further, the aggregate net working capital accruals is decomposed into its main operating constituents: debtors, stock and work in progress, and creditors so that *ΔWCAP= ΔDebtors+ΔStock–ΔCreditors*.[62] As expected, all three working capital components exhibit a strong asymmetric sensitivity to contemporaneous bad news. The change in debtors accounts *ΔDebtors* exhibits the highest asymmetry (both incrementally and in total), followed by the change in stock and work in process *ΔStock* and the change in creditors accounts (*ΔCreditors*). Note that the sign of the $\hat{\gamma}_1$ in the regression of returns on *ΔCreditors* variable should be inverted to interpret and compare the results with the other two *ΔWCAP* components. This relative "ranking" of the *ΔWCAP* components is somewhat unexpected given that Thomas and Zhang (2002) find that inventory changes exhibit a "consistent and substantial relation with future returns" (also, Bernard and Noel, 1991, find that some components of the aggregate stock and work in process variable are useful in predicting future sales, another possible measure of performance). This finding does not bear on the overall results for these earnings components. The results regarding working capital accruals thus indicate that both aggregate working capital accruals (*ΔWCAP*) and its three main individual components have an important role in the observed asymmetric timeliness of earnings between good and bad economic news.

The depreciation and amortisation charge (*DEP*) exhibits no asymmetry in response to current bad news and an economically weak, albeit statistically significant, response to current period's good news. This suggests that both increases

[62] A very early discussion of the lower-cost-or-market inventory valuation associated explicitly with conservatism is Scott (1926).

and decreases in fixed assets take some time to be realised and captured by financial statements. Good news in respect to fixed assets and depreciation charge can take on two forms. On the one hand, the negative sign of the good news coefficient $\hat{\beta}_1$ suggests that good news is associated with increased asset base, which in turn increases the depreciation expense, and not with extended life of fixed assets. The extended life of existing fixed assets would result in a decrease, rather than an increase, in the depreciation expense *DEP* since the remaining book value of the asset would be spread over a larger number of years (Elliott and Elliott, 2004). New net investment would, on the other hand, increase the amount of depreciable assets, increase the depreciation expense and lower current and future earnings more. That asymmetric timeliness of earnings is not due to the depreciation expense is also evidenced by a very low absolute value of the total coefficient on bad news $abs(\hat{\beta}_1 + \hat{\gamma}_1)$= 0.010, a very low relative total coefficient $(\hat{\beta}_1 + \hat{\gamma}_1)/\hat{\beta}_1$ = 0.563, and by the fact that the restricted and unrestricted versions of the regressions produce almost identical results – the differences are significant in only 6 cases, but again these differences appear to be more in statistical rather than economic terms.

Special items (*SPEC*) as an accrual component should capture an important part of the observed asymmetric timeliness in earnings. While the results in Table 4-8 show that *SPEC* indeed captures a significant proportion of the observed asymmetric sensitivity of earnings to current-period bad news, the $\hat{\gamma}_1$ coefficient is lower than the corresponding coefficient on *ΔWCAP* and the *ΔDebtors* component. The sign of the $\hat{\gamma}_1$ coefficient in the *SPEC*-equation is positive, indicating that more bad news is associated with higher (i.e., more negative) *SPEC* that in turn reduces earnings more. This is consistent with bad news being passed in a significant part through extraordinary and/or exceptional items within the current accounting period. The sign of the good news coefficient $\hat{\beta}_1$ is, on the other hand, negative. This would suggest that good news results in an economically small, albeit statistically significant reduction of earnings. This conclusion is consistent with the results presented in Table 4-5, where differences in bivariate correlations among *RET* and accruals split by good/bad news suggested different roles for accruals for good/bad news observations. Both the total and the relative bad news coefficient are consistent with predictions under conservative accounting. High asymmetric timeliness of *SPEC* is also evidenced by a comparison of the restricted and unrestricted versions of regressions. In particular, the average R^2 almost doubles from one version to the other and the increase is statistically significant in 15 individual cross-sections.[63]

As a final check of the relations described above, regressions are also run on total accruals as the dependent variable (*Accruals* (*tot.*)) (results are shown in Appendix F, Table F-3). The results indicate that the asymmetric timeliness is highest if all accruals components are merged into one variable. This is to be expected, given that the aggregate measure likely captures different aspects of accounting conservatism. This is directly consistent with the differences between cash flow and earnings measures.

To sum up, the results in this sections show and reconfirm that accounting conservatism is an important feature of the accounting earnings figures. The more accruals an earnings measure contains, the more asymmetric timeliness with respect to incorporation of bad news it exhibits. The results highlight the important role

[63] See, however, section 4.5.2 for a discussion of the size of R^2s compared to R^2 in earnings regressions.

working capital accruals and special items in this asymmetric timeliness. (Operating) cash flow measures are not affected by this phenomenon, as expected, given that this accounting measure contains no accruals.

4.5.2 Accruals and low R^2s

If accruals make earnings more timely in reflecting value-relevant information, this should be reflected in increasing R^2s as more accruals are added to operating cash flows to arrive at accounting earnings and the timeliness increases.[64] For example, in Table 4-8, the R^2s for the ordinary earnings and earnings after exceptional and extraordinary items (*EARN*) are more than three times higher than the average R^2 from the *OCF* regression. However, the R^2s in accruals' regressions are very low, too, ranging from 0.018 to a maximum of 0.024. This appears to be inconsistent with accruals making earnings more timely than cash flows, since more timeliness by definition implies more economic news in accounting earnings, a greater correspondence between returns and earnings and thus a higher R^2.

One possible explanation of low observed R^2s in accruals' regressions is the measurement error in dependent variables. In this study, measurement error might be introduced in dependent variables in the case of working capital accruals variables had these variables been calculated as balance-sheet differences (Hribar and Collins, 2002). This would have the effect of lowering the R^2s and leaving the estimated

[64] Counter to the increasing R^2s is the presence of "transitory items" which lower the R^2 (Pope and Walker, 1999).

$\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients in models in equation (4-6) above unbiased (unattenuated). However, balance-sheet differences are not employed in the regressions in this thesis to calculate accruals. The data on accruals is taken directly from cash flow or funds flow statements. Even in the early sample years, there are some weak indications that the accruals data was not simple balance sheet differences (e.g., Cadbury Schweppes, 1969),

The second, incomplete, partial and only conceptual explanation might be the following. The unrestricted (piece-wise) linear regressions whose results are presented in Table 4-8 are derived from the respective restricted versions by allowing the incremental response for non-positive returns. The restricted "reverse" models in Table 4-8 are derived by reversing what would be the equivalent of traditional returns-on-earnings models (or, generally, returns on any accounting performance measure) to arrive at these "reverse" models where accruals are regressed on returns, disregarding the sign of returns.[65] In these reverse bivariate models, the R^2s are functionally related to the estimated regression coefficient and the variance ratio (VR).[66]

To derive this explanation, assume the following general simple (bivariate) regression model, where an accounting performance measure (Y) is regressed on returns:

[65] Note, however, that these simple "unreversed" bivariate regressions can always be estimated separately for two sub-samples, the good news and bad news sub-samples. The term "simple" relates merely to the fact that the models themselves do not allow for this asymmetry by incorporating a dummy variable indicating the two (or more) sections.
[66] These models are then augmented to allow for the asymmetric responsiveness of various accounting measures to good/bad news.

$$Y_i = \psi_1 + \psi_2 RET_i + u_i \tag{4-8}$$

In this regression, the R^2 is a function of the estimated regression coefficient $\hat{\psi}_2$ and the variance ratio, defined as the ratio between the variance of the independent variable (returns, *RET*) and the variance of the dependent variable (*Y*), var(*RET*)/var(*Y*):

$$R^2 = \hat{\psi}_2^2 \cdot \frac{\text{var}(RET)}{\text{var}(Y)} \tag{4-9}$$

For a more timely accounting performance measure *Y*, the variance ratio should be lower, which would lead, other things being equal, to a lower, rather than to a higher R^2. This is because more timeliness implies a greater proportion of variability in economic news (var(*RET*)) must be explained by the variability of the accounting measure (var(*Y*)). Therefore, if the accounting system is conservative, then the variability of the accounting performance measure should increase towards the variability of returns (var(*Y*)→var(*RET*)) as the measure *Y* becomes more timely and the variance ratio towards unity (VR→1) as the timeliness property of *Y* increases. Note that in Pope and Walker's (1999) model this would imply that news is recognised without a lag and the $\hat{\psi}_2$ coefficient would equal $(1/k)$, the cost of capital.

Replacing the accounting measure Y with a generic version of accounting earnings (E):[67]

$$E_i = \gamma_1 + \gamma_2 RET_i + u_i \tag{4-10}$$

the R^2 in such a regression is a function of the estimated regression coefficient $\hat{\gamma}_2$ and the variance ratio, defined here as the ratio between the variance of returns and the variance of earnings, var(RET)/var(E):

$$R^2 = \hat{\gamma}_2^2 \cdot \frac{\text{var}(RET)}{\text{var}(E)} \tag{4-11}$$

This variance ratio can be decomposed further. Assuming accounting earnings has two main components, the operating cash flow and accruals so that E = OCF + A, the variance of earnings var(E) in equation (4-11) consequently depends on the variance of the earnings' two constituent parts, namely the variance of accruals var(A) and the variance of operating cash flows var(OCF), as well as the covariance between accruals and operating cash flow cov(E,OCF). Thus the variance ratio in equation (4-11) can be decomposed into:

$$\frac{\text{var}(RET)}{\text{var}(E)} = \frac{\text{var}(RET)}{\text{var}(OCF + A)} = \frac{\text{var}(RET)}{\text{var}(OCF) + \text{var}(A) + 2r_{OCF,A}\sigma_{OCF}\sigma_A} \tag{4-12}$$

[67] The terms accruals, earnings, operating cash flows and returns are used here in generic terms and they are not following the empirical definitions from section 4.2. The assumption that $E = A + OCF$ is however maintained.

where σ_{OCF} and σ_A are the standard deviations of *OCF* and A and $r_{OCF,A}$ denotes the simple bivariate correlation coefficient between *OCF* and *A*. Ball, Kothari and Robin (2000) view *OCF* as a noisier measure of performance than earnings and thus $\sigma_{OCF}>\sigma_E$ and var(*OCF*)>var(*E*). Also, by definition, var(*A*)>0. If the denominators on the left-hand side (LHS) and right-hand side (RHS) of equation (4-12) are to be equal, the variability of operating cash flows, var(*OCF*), and the additional variability of accruals, var(*A*)>0, must be reduced by the strong negative contemporaneous correlation between accruals and operating cash flows $r_{OCF,A}<0$. This requirement follows from the relation var(*E*)<var(*OCF*). If there were no other terms apart from those related to *OCF*, the equality between the LHS and RHS of (4-12) would have been violated. Since var(*A*) itself only further increases this difference, the term $(2 \cdot r_{OCF,A} \cdot \sigma_{OCF} \cdot \sigma_A)$ must be the component of the denominator on the RHS of (4-12) that causes earnings to be less variable than cash flows and in particular the correlation coefficient $r_{OCF,A}$ (the other two terms in the third factor in the denominator on the RHS of (4-12) are positive). This leads to a lower denominator, a higher variance ratio and a higher R^2. In other words, earnings are more timely than cash flows, because accruals anticipate a part of future cash flows. By definition, they offset the negative autocorrelation in operating cash flows and this result in a smoother time-series of earnings.[68]

The strong and negative correlation between operating cash flows and accruals is well established theoretically and empirically (e.g., Dechow, 1994, Dechow, Kothari and Watts, 1998). That $r_{OCF,A} << 0$ can also be observed from the

[68] The term autocorrelation is used to indicate lagged correlation of a variable with itself as opposed to the term serial correlation to indicate lagged correlation between two different time series (eg. between variables A_t and OCF_{t-1}). This distinction is often not made (Gujarati, 2003, p. 443), but it might be useful to make this distinction within this explanation.

descriptives of the empirical variables in this study. Simple bivariate correlations are presented in Table 4-4 and standard deviations in Table 4-1 (Panel A).

Turning next to the model where accruals are regressed on returns and where the accruals are defined by the identity $A = E - OCF$:

$$A = \alpha_1 + \alpha_2 RET + w \tag{4-13}$$

Decomposition of the R^2 in this regression in a way similar to the decomposition of the R^2 in the earnings regression above, rearranging the order of the terms in the denominator, yields the following expression for the variance ratio:

$$\frac{\text{var}(RET)}{\text{var}(A)} = \frac{\text{var}(RET)}{\text{var}(E - OCF)} = \frac{\text{var}(RET)}{\text{var}(OCF) + \text{var}(E) - 2r_{OCF,E}\sigma_{OCF}\sigma_E} \tag{4-14}$$

Comparing first the LHSs of (4-14) and (4-12), assume first that var(E) is lower than var(A), leading to a higher VR and a *ceteris paribus* higher R^2. Next, note that the denominators in both equations start with the variance of operating cash flows, var(OCF). To this variance, var(A) is added in (4-12) and var(E) in (4-14). If there were no further terms in the denominators of both equations, the denominator in (4-14) would be lower than the denominator in (4-12), leading to a higher VR and a higher R^2s, reasonably assuming that var(E)<var(A) (given the observation that earnings is a smoother performance measure due to accruals that offset variability in operating cash-flow time-series (Ball, Kothari and Robin, 2000), it is to be expected that var(E)<var(A)). If, however, this is not the case – in fact, the observed empirical R^2 show quite the opposite – this must be a result of the third terms in both

equations, and in particular the respective correlation coefficients. In (4-12) the correlation coefficient $r_{OCF,A}$ is expected to be very high in absolute terms and negative, thus more than offsetting the sum var(*OCF*)+var(*A*) to arrive finally at the relatively low var(*E*), high VR and high R^2 in earnings-on-returns regressions. This is because accruals offset negative serial correlation in operating cash flows to produce a smoother earnings figure (Dechow, Kothari and Watts, 1998; Dechow, 1994). In (4-14), on the other hand, while starting with a comparably lower sum of variances var(*OCF*)+var(*E*) due to the assumption that var(*E*)<var(A) compared to (4-12), the third term (particularly due to the correlation coefficient $r_{OCF,E}$), subtracts relatively little from the sum var(*OCF*)+var(*E*), thus leaving the denominator relatively high, the VR relatively low and, consequently, leading *ceteris paribus* to a relatively low R^2, too. Therefore, because of the nature of accounting numbers, the (relatively) low R^2s in regressions where accruals act as dependent variables are to be expected if accruals have the role of making earnings more timely than cash flows

The empirical observations in this research (see Table 4-4 and Table 4-1) regarding the magnitudes of the variabilities and correlations of (between pairs of) operating cash flow, earnings and accruals support the assumptions used above. For example, the empirical values of the correlation coefficients among some of the variables used in this study are $r_{OCF,\ Accruals\ (tot.)}= -0.628$ and $r_{OCF,\Delta WCAP}= -0.422$ compared to the $r_{OCF,EARN}= +0.333$ (note that only the magnitudes of these coefficients are important, because the correlation terms in equations (4-12) and (4-14) are of opposite signs). On the other hand, $\sigma_{EARN}= +0.122$, and $\sigma_{Accruals\ (tot.)}= +0.205$ and $\sigma_{\Delta WCAP}= +0.172$.

Finally, the empirical results in the preceding section 4.5.1 indicate that the R^2s in accruals regressions are only half the R^2s in operating cash flow regressions and even slightly lower than in the corresponding net change in cash (*ΔCASH*)-regression shown in Appendix F (Table F-3). Using the same analysis, an attempt to explain this observation is provided below.

Starting with the operating cash flow regression where operating cash flows are defined by the identity $OCF = E - A$:

$$OCF_i = \beta_1 + \beta_2 RET_i + v_i \tag{4-15}$$

and decomposing the R^2 resulting from this regression similarly to the decomposition of the earnings and accruals regressions above, rearranging the order of the terms in the denominator, yields the following expression for the variance ratio:

$$\frac{\text{var}(RET)}{\text{var}(OCF)} = \frac{\text{var}(RET)}{\text{var}(E-A)} = \frac{\text{var}(RET)}{\text{var}(E)+\text{var}(A)-2r_{E,A}\sigma_E\sigma_A} \tag{4-16}$$

By comparing the accruals-regression's VR in equation (4-14) and the above operating cash flow-regression's VR in equation (4-16), it can be observed that the difference between the two VRs depends on the relative variances of accruals and operating cash flows, var(A) and var(OCF), as well as the relative sizes of the correlation coefficients $r_{E,A}$ and $r_{E,OCF}$. While it would be difficult to specify any differences in the variability of the two earnings components, there is some evidence in the existing literature that var(A)>var(OCF) (e.g., Dechow, Kothari and Watts, 1998, Barth and Clinch, 1999, Dechow and Dichev, 2002).[69] Other things being equal, these variances would imply a higher denominator on the RHS of (4-16) compared to the denominator on the RHS in (4-14). This would lead to a lower VR and a lower R^2 in operating cash flow regression. Apart from the LHSs of respective decompositions, empirical observations are not consistent with this. The second important factor must thus be the respective correlation coefficients. Existing empirical evidence shows that the correlation of earning with its operating cash flow component is generally stronger than the correlation of earnings with its accruals component, $r_{E,OCF}>r_{E,A}$ (e.g., Barth, Cram and Nelson, 2001), leading to a higher reduction of the sum var(E)+var(OCF) in (4-14) compared to the reduction of the sum var(E)+var(A) in (4-16). Thus, a relatively high denominator on the RHS of (4-16) is subject to a relatively lower reduction by the correlations term, which would lead to a higher denominator, to a lower VR and a lower R^2 compared to the accruals regressions. Based on this illustration, it is to be expected that estimation of the operating cash flow regressions will lead to lower (not higher) R^2s relative to accruals' regressions, but because the the differences between var (OCF) and var (A) do not appear very large, the net result of the OCF-regressions is questionable.

The descriptive data in this study (see Table 4-4 and Table 4-1) shows that the expectations depend on the specific type of accruals with which to substitute the generic accruals A. For example, $r_{EARN,OCF}$= +0.333, and $r_{EARN,\ Accruals\ (tot.)}$= +0.405

[69] Caution needs to be exercised when comparing the values of these parameters in this study with existing literature. The definitions of variables, deflators, time periods covered and methods of calculation (pooled, cross-sectional averages, time-series averages) differ from study to study, in some cases significantly. Even within this study, different types of earnings exhibit quite significant properties.

while $r_{EARN,\ \Delta WCAP}$= +0.331.[70] A higher correlation coefficient implies a smaller denominator on the RHS of VR in (4-16) and a higher VR, which leads, *ceteris paribus*, to a higher R^2. This part of the analysis thus does not provide clear predictions regarding relative sizes of R^2s from accruals and operating cash flow regressions.

For completeness, note that the R^2 in the operating cash flow regressions, given the discussion above, must result in R^2s that are on average lower than the R^2s in earnings' regressions.

Regardless of the explanation provided in this section, Chambers, Jennings and Thompson II, 1999) provide an alternative explanation that might be related to the observed low R^2s for the equations using *DEP* as the dependent variable. They state that current depreciation expense may not be a good predictor of future fixed assets services for several reasons. Among them, they note that the depreciation charge depends on estimates of useful life and salvage value of the fixed asset and are therefore subject to considerable measurement error. Assuming the error is random and noting that the measurement error is in the dependent (not the independent) variable, this would result in higher error terms and lower R^2s in those regressions.

The relations presented above may help to explain why the R^2s in the accruals regressions are much lower than in either operating cash flow regressions or earnings regressions. The property of accruals to increase the timeliness of cash flows to

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[70] It is interesting that $r_{EARN,OCF}$= +0.333 and the $r_{EARN,\ \Delta WCAP}$= +0.331 coefficients are very close, possibly suggesting that both components have equal weighting in arriving at the earnings figure.

generate a more timely earnings measure itself causes the accruals regressions to have low explanatory power. The fact that a complete discussion of the problem of low R^2s in accruals regressions would have to deal with the question of estimated regression coefficients $\hat{\alpha}_2$, $\hat{\gamma}_2$ and $\hat{\beta}_2$, given that these are likely to differ from one regression to the other, is acknowledged.

4.5.3 Time series of ex-post conservatism measures

Several recent papers report that conservatism has increased over time (e.g., Ryan and Zarowin, 2003; Klein and Marquardt, 2002; Givoly and Hayn, 2000). To study possible changes in accounting conservatism over time in the United Kingdom, the following analysis is performed. First, the estimated regression coefficients on good news $\hat{\beta}_1$, estimated incremental coefficients on bad news $\hat{\gamma}_1$, the total coefficient on bad news $(\hat{\beta}_1 + \hat{\gamma}_1)$ and the R^2s from the 33 cross-sectional regressions on each earnings and earnings component figures used to produce the contemporaneous set of results are recovered. These parameters are then used in simple linear time-trend regressions of the following type (e.g., Brown, Lo and Lys, 1999):

$$est(parameter_{ijt}) = \tau_{1ij} + \tau_{2ij} \cdot \mathrm{T} + \xi_{ijt} \tag{4-17}$$

where $parameter_{ijt}$ is an estimated regression parameter from the contemporaneous model in equation (4-6) in section 4.5.1 for year t, i denotes one of the ten dependent variables (earnings, operating cash flows and accruals) in contemporaneous models listed in the leftmost column of the results' table below, j denotes the parameter (good news, incremental bad news, total bad news and R^2s) used as the dependent variable in time-trend regressions and T denotes technical time $T = (-16,\ldots, 0,\ldots, +16)$ corresponding to the time interval 1969–2001. This definition of technical time ensures that in time-trend regressions the parameter τ_{1ij} measures the equally-weighted cross-sectional average of the estimated parameter $est(parameter_{ij})$ and the parameter τ_{2ij} shows the periodical increases in the value of $est(parameter_{ij})$. If conservatism is increasing through time, the estimated $\hat{\tau}_{2ij}$ parameters of regressions (4-17) using estimated parameters from regressions on dependent variables that reflect the asymmetric timeliness property (principally the estimated $\hat{\gamma}_1$ and R^2 statistics) should be increasing through time.

The results of estimating the model in equation (4-17) for all ten dependent variables and all three main conservatism measures are presented in Table 4-9. The estimated time-trend slope coefficient $\hat{\tau}_2$ is increasing through time only for the time-series of incremental bad news coefficients $\hat{\gamma}_1$ from the regressions where earnings after extraordinary and exceptional items (*EARN*) are employed as the dependent variable. The time-trend resulting from the time-series of total coefficients on bad news $(\hat{\beta}_1 + \hat{\gamma}_1)$ in *EARN*-regressions is not statistically significant. Note that the *EARN* figure is the most comprehensive earnings measure employed in this study and should therefore reflect all accruals, operating as well as non-operating. Consequently, the effects of increasing conservatism through time should be most

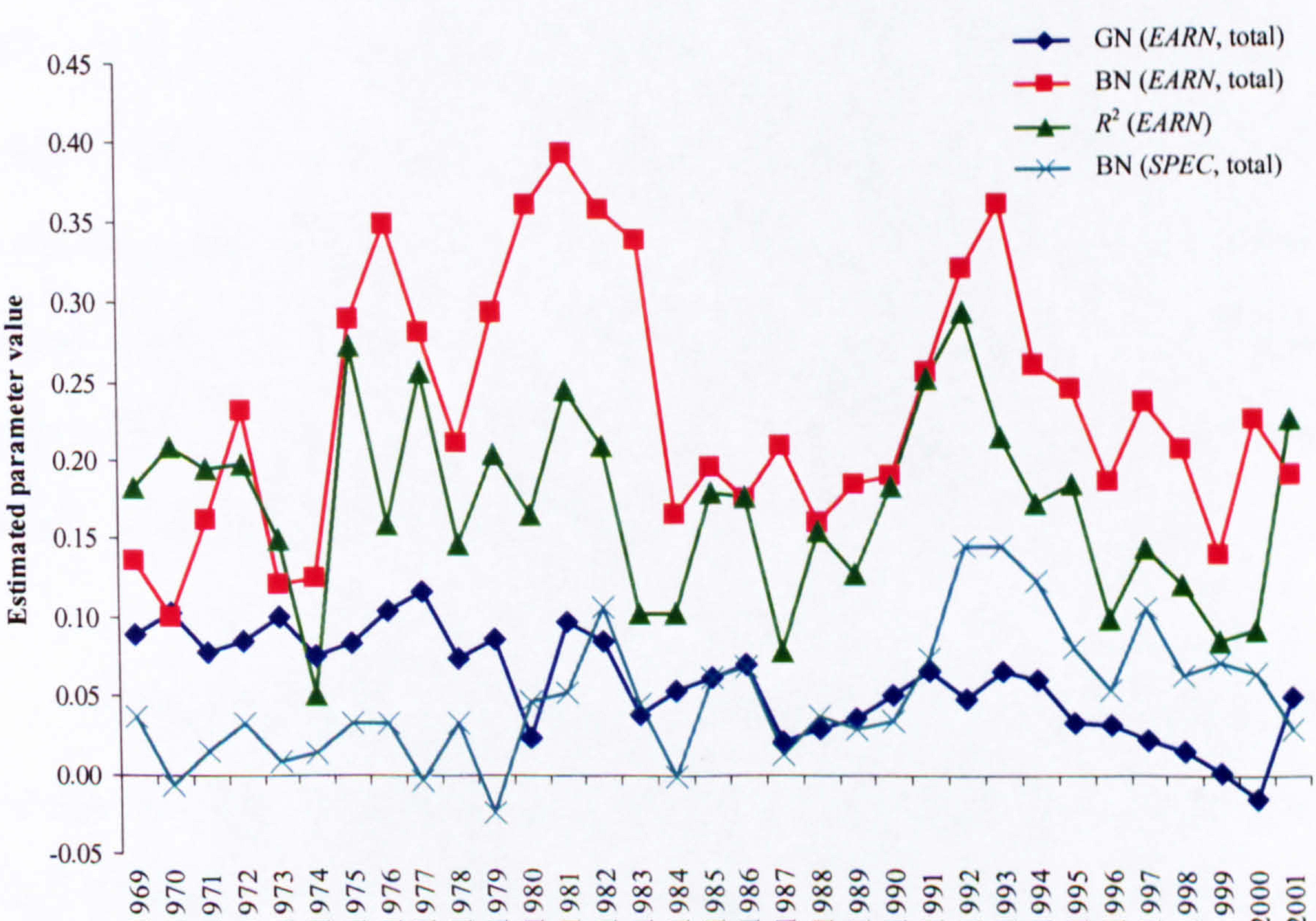
Table 4-9: Time-series trends in good news, incremental bad news, total bad news and R^2 cross-sectional coefficients from contemporaneous Pope and Walker (1999) model, 1969–2001

Yearly parameters $\hat{\beta}_{1i}$, $\hat{\gamma}_{1i}$, ($\hat{\beta}_{1i}+\hat{\gamma}_{1i}$) and R^2_i values from contemporaneous model:	est(β_{1i})			est(γ_{1i})			est($\beta_{1i}+\gamma_{1i}$)			est(R^2_i)		
	$\hat{\tau}_1$	$\hat{\tau}_2$	R^2	$\hat{\tau}_1$	$\hat{\tau}_2$	R^2	$\hat{\tau}_1$	$\hat{\tau}_2$	R^2	$\hat{\tau}_1$	$\hat{\tau}_2$	R^2
	t-stat.	*t*-stat.	*F*-stat.	*t*-stat.	*t*-stat.	*F*-stat.	*t*-stat.	*t*-stat.	*F*-stat.	*t*-stat.	*t*-stat.	*F*-stat.
Operating cash flows												
OCF	**0.101**	**-0.003**	**0.199**	0.046	0.002	0.020	**0.147**	-0.001	0.004	**0.057**	0.000	0.004
	9.284	**-2.776**	**7.708**	1.714	0.804	0.647	**5.841**	-0.332	0.111	**7.909**	0.347	0.120
Earnings												
OP	**0.100**	**-0.004**	**0.367**	**0.139**	0.001	0.004	**0.239**	-0.004	0.093	**0.163**	-0.001	0.007
	10.105	**-4.235**	**17.939**	**7.065**	0.360	0.130	**12.140**	-1.780	3.168	**14.260**	-0.477	0.227
ORD	**0.058**	**-0.003**	**0.607**	**0.120**	0.001	0.047	**0.178**	-0.001	0.049	**0.199**	-0.002	0.048
	15.133	**-6.921**	**47.898**	**11.305**	1.240	1.539	**16.549**	-1.260	1.589	**16.411**	-1.247	1.555
EARN	**0.058**	**-0.003**	**0.594**	**0.174**	**0.003**	**0.132**	**0.232**	0.001	0.004	**0.171**	-0.001	0.034
	15.899	**-6.730**	**45.295**	**12.625**	**2.176**	**4.734**	**16.300**	0.372	0.139	**16.428**	-1.041	1.084
Accruals												
ΔWCAP	**0.017**	-0.001	0.057	**0.084**	-0.002	0.021	**0.100**	-0.003	0.061	**0.018**	**-0.001**	**0.131**
	2.178	-1.373	1.884	**4.070**	-0.813	0.661	**5.256**	-1.421	2.020	**8.072**	**-2.160**	**4.665**
ΔWCAP components:												
- of which *ΔDebtors*	**0.034**	0.000	0.000	**0.083**	-0.004	0.056	**0.117**	-0.004	0.055	**0.023**	0.000	0.001
	6.226	0.008	0.000	**3.256**	-1.361	1.852	**4.549**	-1.342	1.801	**10.498**	0.151	0.023
- of which *ΔStock*	**0.029**	**-0.001**	**0.146**	**0.056**	-0.001	0.003	**0.085**	-0.002	0.040	**0.020**	0.000	0.058
	5.068	**-2.302**	**5.301**	**3.233**	-0.301	0.091	**5.255**	-1.130	1.276	**8.198**	-1.378	1.899
- of which *ΔCreditors*	**-0.046**	0.000	0.007	**-0.055**	0.002	0.029	**-0.101**	0.003	0.035	**0.021**	0.000	0.069
	-7.648	0.451	0.203	**-2.306**	0.970	0.941	**-4.214**	1.067	1.139	**9.579**	1.519	2.308
DEP	**-0.017**	0.000	0.000	0.008	0.000	0.002	-0.010	0.000	0.001	**0.020**	0.000	0.001
	-5.441	0.097	0.009	1.000	-0.241	0.058	-1.362	-0.207	0.043	**5.725**	-0.162	0.026
SPEC	**-0.007**	0.000	0.032	**0.056**	**0.002**	**0.188**	**0.049**	**0.002**	**0.315**	**0.023**	0.001	0.087
	-2.096	1.006	1.012	**7.589**	**2.680**	**7.181**	**7.997**	**3.777**	**14.269**	**6.374**	1.717	2.948

Notes. Estimated regressions are: est(*parameter*$_{ijt}$) = $\tau_{1ij} + \tau_{2ij}T + \xi_{tij}$ where *parameter*$_{ij}$ is an estimated regression parameter from the contemporaneous models, *i* denotes one of the ten dependent variables in models listed in the leftmost column, *j* denotes the parameter used as the dependent variable in time-trend regressions and *T* denotes the technical time T = [-16,…0,+16]. Below each of the τ_{1ij} and τ_{2ij} coefficients is the time-trend *t*-statistics and below the R^2s is the *F*-statistic. Boldfaced estimates are significant at 5% or better (critical values are $t_{c,\alpha=0.05}$(31 d.f.)= 2.040 and $F_{c,\alpha=0.05}$(1 d.f.,31 d.f.)= 4.160.

apparent when evaluating the time-series of cross-sectional regression coefficients on *EARN*, followed by *ORD* and *OP*. Consistent with increasing conservatism through time as captured by the movements in $\hat{\gamma}_1$ for the *EARN* figure, the incremental and total coefficients on special items (*SPEC*) are also increasing through time. The R^2s from aforementioned time-trend regressions are high in value and highly statistically significant. The time series of estimated coefficients $\hat{\beta}_1$, $\hat{\gamma}_1$, $(\hat{\beta}_1 + \hat{\gamma}_1)$ and the R^2 from the 33 cross-sectional regressions of *EARN* on returns andthe time series of total bad news coefficient $(\hat{\beta}_1 + \hat{\gamma}_1)$ of *SPEC* on returns, are plotted in Figure 4-3 to provide an alternative presentation of the movements of these parameters through time.

Figure 4-3: Time-series of estimated good news, incremental bad news, total bad news and R^2 from earnings (*EARN*) regressions and total bad news from special items (*SPEC*) regressions, 1969-2001



Notes to Figure 4-3: BN (*EARN*, total) is the time series of estimated total parameters on good news, incremental parameters on bad news, total parameters on bad news and R^2 from cross-sectional regressions on earnings after extraordinary and exceptional items (*EARN*) and special items (*SPEC*).

Figure 4-3 further emphasises that the sensitivity of earnings (*EARN*) to good news is declining over time (dark blue line). A statistically significant decline in sensitivity to good news can also be observed in Table 4-9 for the operating cash flows (*OCF*) figure, other measures of earnings (*OP* and *ORD*) and some of the accruals components (*ΔStock*), while for other accruals measures the sensitivity does not change over time (it does not increase, though). These findings are consistent with recent US literature concerned with declining value relevance of financial statements and in particular the profit and loss account (e.g., Ryan and Zarowin, 2003; Francis and Schipper, 1999; Lev and Zarowin, 1999; Collins, Maydew and Weiss, 1997).

Conservative accounting should result in large, one-time, transitory items that lower the means of earnings variables, but affect the medians only by a very small amount, thereby inducing negative skewness of earnings variables (Ball, Kothari and Robin, 2000; Givoly and Hayn, 2000). Moreover, the capitalisation of current and/or expected economic losses under conservative accounting should result in greater variability of the earnings figures. Therefore, if ex-post conservatism is increasing through time, this should result in increasing negative skewness of the earnings figure relative to the operating cash flow figure and increasing variability of earnings relative to operating cash flows through time.[71]

Figure 4-4 and Figure 4-5 present the time-series of cross-sectional skewness and standard deviation parameters respectively of operating cash flows (*OCF*) and earnings after extraordinary and exceptional items (*EARN*). Given that conservatism

[71] The cross-sectional characteristics of these accounting items are presented and discussed in section 4.3.

is an accruals phenomenon, the results for the *OCF* figure should provide a base-case scenario of the behaviour through time of accounting figures that is not due to accounting conservatism (e.g., varying general economic conditions over the 33 years). Both figures include a time-series of yearly relative measures for skewness and standard deviation statistics respectively. Yearly relatives are defined as:

$$Relative(skew) = skew(EARN)/skew(OCF) \quad (4\text{-}18a)$$

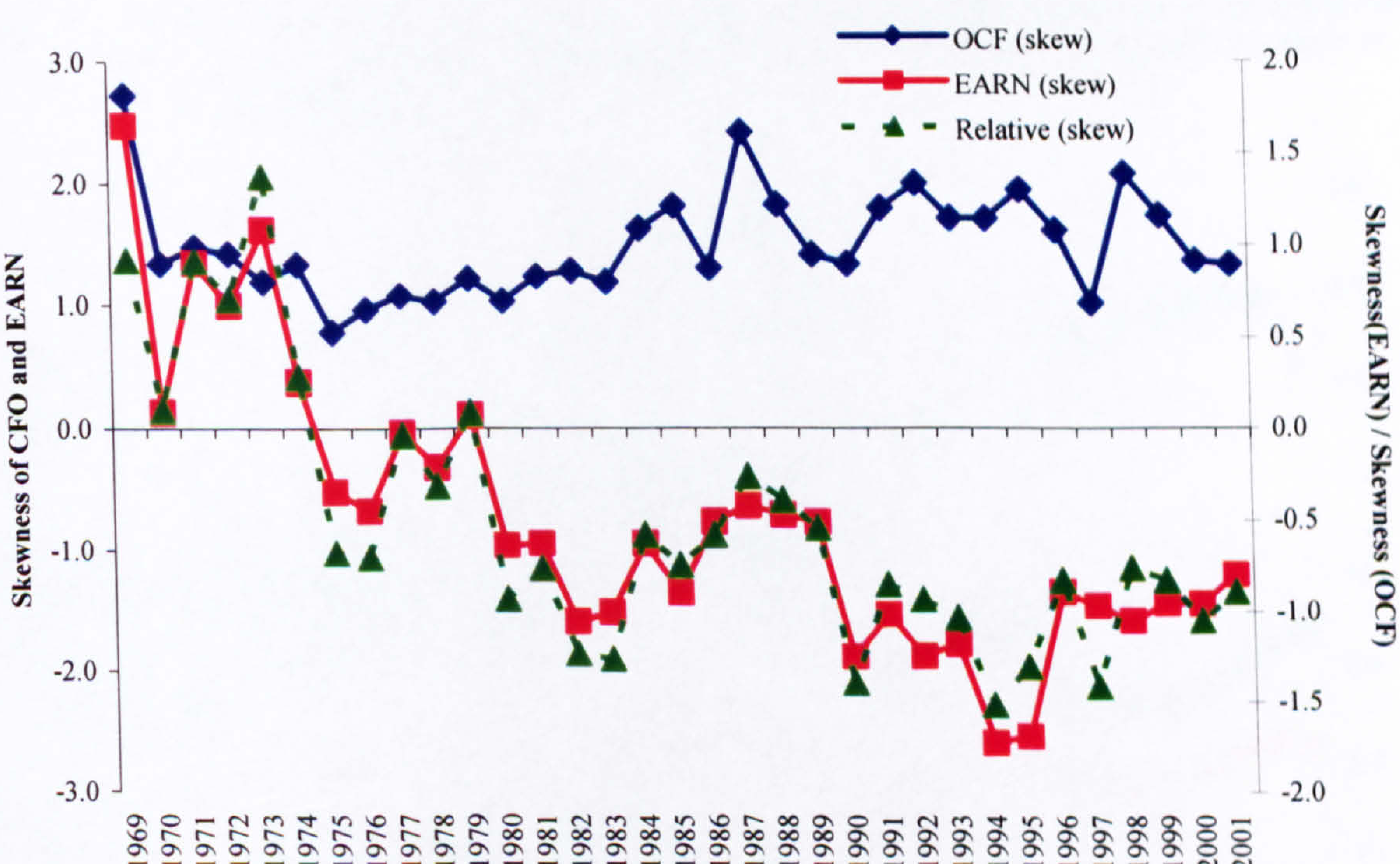
and

$$Relative(st.\ dev.) = \sigma_{EARN} / \sigma_{OCF} \quad (4\text{-}18b)$$

If accounting conservatism is increasing through time, the first relative measure should decrease over time (i.e., *skew(EARN)* should become more and more negative) and the second measure increase over time (i.e., σ_{EARN} should become higher and higher, while σ_{OCF} should not change materially). To assess the statistical significance of the time-series movements in cross-sectional estimates of skewness and standard deviations, the time-trend model in equation (4-17) above is employed analogously by substituting estimated cross-sectional regression coefficients with cross-sectional skewness and standard deviations and corresponding relative measures defined in (4-18a) and (4-18b).

Consistent with increasing conservatism through time, the skewness of earnings *EARN* is increasing in magnitude - i.e., it is becoming more negative, both in the absolute sense and relative to the skewness of the operating cash flow figure. Both trends are statistically significant (see also Table 4-10). The skewness of *EARN* is negative on average and is generally negative in every year after 1974 (except in 1979), consistent with the introduction of SSAP 6 *Extraordinary items and prior year adjustments* for fiscal years ending on or after 1st January 1974 that required extraordinary items to be passed through the profit and loss account rather than through reserves (ASC ED, 1985, p. 4) which should induce negative skewness in the earnings distribution. The positive skewness of operating cash flows is not statistically significantly increasing through time (*t*-statistics= 1.399), as expected if conservatism does not affect this figure.[72]

Figure 4-4: Time-series movements of cross-sectional estimates of skewness of operating cash flows (*OCF*) and earnings (*EARN*) and cross-sectional relative of skewness of *OCF* and *EARN*, 1969-2001

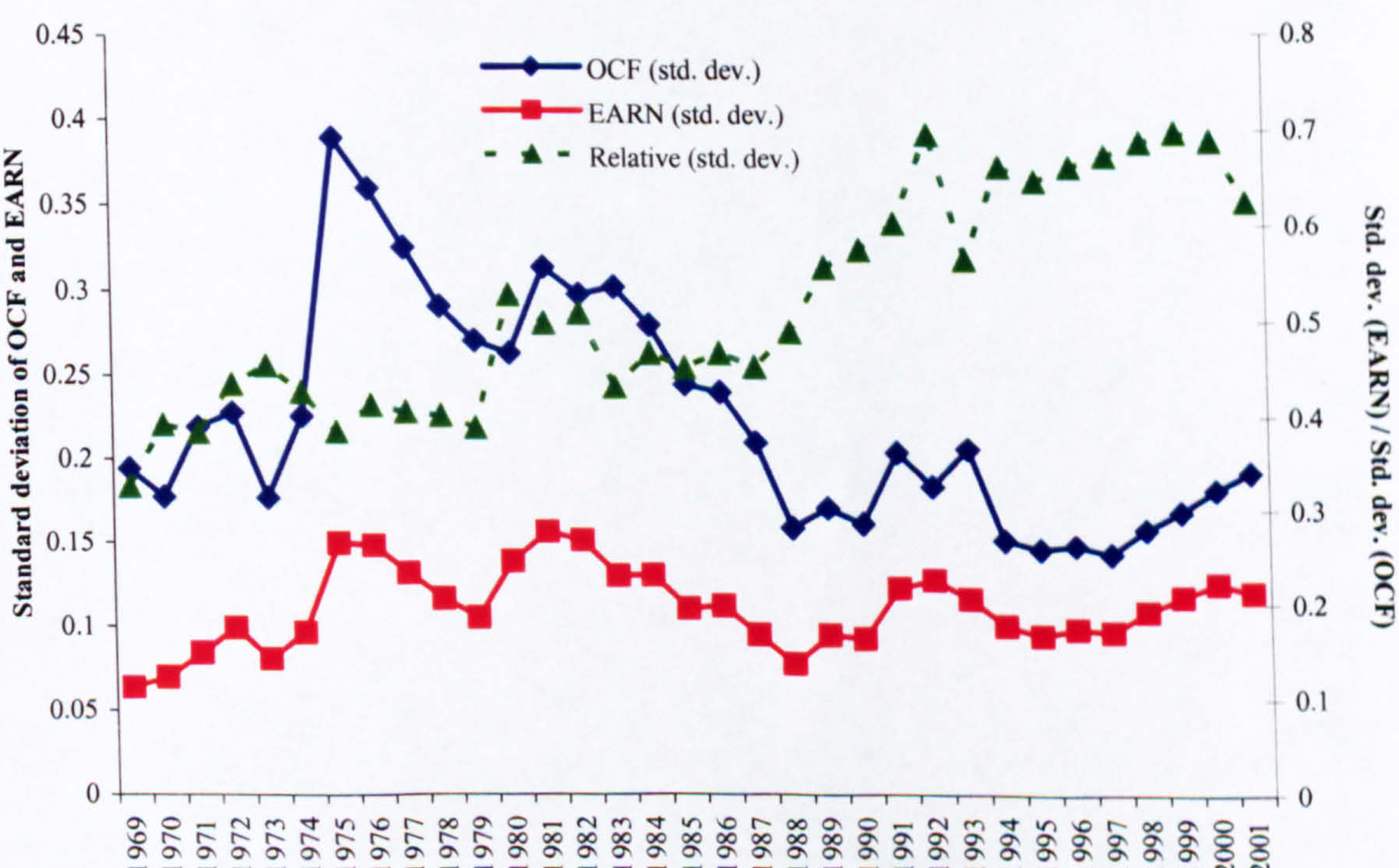


Notes to Figure 4-4: *OCF* (skew) is the time series of cross-sectional skewness measure of the operating cash flow, *EARN* (skew) is the time series of cross-sectional skewness measure of earnings after extraordinary and exceptional items and *Relative*(skew) is defined as *skew*(*EARN*)/*skew*(*OCF*) for each cross-section.

[72] For completeness, note that an alternative explanation of no change through time might be that even though conservatism would be reflected in the *OCF* figure it would not increase through time. Under conservative accounting, this explanation is not likely.

The absolute variability of earnings after extraordinary and exceptional items (σ_{EARN}) does not, on average, increase through time. Whilst the time-trend coefficient is positive, it is economically marginal and statistically insignificantly different from 0. This finding is not consistent with accounting conservatism increasing through time. It is in contrast with indications presented above (see Table 4-9, Figure 4-3 and Figure 4-4). It also contrasts Givoly and Hayn (2000) findings for the US. However, strictly speaking, Givoly and Hayn (2000, p. 294) postulate that the variability of earnings should increase *relative to* the variability of operating cash flows rather than just increase in the absolute sense. The increases of relative measures of variability of earnings versus operating cash flows $\sigma_{EARN} / \sigma_{OCF}$ is consistent with increasing conservatism through time in the UK.

Figure 4-5: Time-series movements of cross-sectional estimates standard deviations of operating cash flows *OCF* and earnings *EARN* and the cross-sectional relative of standard deviation of *OCF* and *EARN*, 1969-2001



Notes to Figure 4-5: *OCF* (std. Dev.) is the time series of cross-sectional standard deviations of operating cash flow from the cross-sectional means, *EARN*(std. Dev.) is the cross-sectional standard deviation of earnings after extraordinary and exceptional items and *Relative*(std. Dev) is defined as *skew*(*EARN*) / *skew*(*OCF*) for each cross-section.

The time-series movements of cross-sectional estimates of skewness and standard deviations of other accounting variables used in this study are presented in Table 4-10.

Table 4-10: Time-series of skewness and standard deviations of earnings and earnings components, 1969-2001

Skewness (std. dev.) of variable:	Skewness $\hat{\tau}_{1ij}$ *t*-stat.	Skewness $\hat{\tau}_{2ij}$ *t*-stat.	Skewness R^2 *F*-stat.	Standard deviation $\hat{\tau}_{1ij}$ *t*-stat.	Standard deviation $\hat{\tau}_{2ij}$ *t*-stat.	Standard deviation R^2 *F*-stat.
Operating cash flows						
OCF	**1.495**	0.011	0.059	**0.223**	**-0.004**	**0.287**
	20.414	1.399	1.957	22.628	-3.528	12.448
Earnings						
OP	**1.105**	**-0.031**	**0.265**	**0.152**	**-0.003**	**0.342**
	12.351	-3.347	11.200	20.740	-4.012	16.093
ORD	-0.015	**-0.076**	**0.563**	**0.087**	0.000	0.056
	-0.131	-6.325	40.007	28.001	-1.360	1.850
EARN	**-0.771**	**-0.094**	**0.626**	**0.110**	0.000	0.014
	-6.213	-7.204	51.900	26.577	0.665	0.443
Accruals						
ΔWCAP	0.134	**-0.031**	**0.261**	**0.162**	**-0.004**	**0.407**
	1.530	-3.306	10.932	21.715	-4.614	21.289
ΔWCAP components:						
- of which *ΔDebtors*	**1.635**	-0.028	0.012	**0.169**	**-0.004**	**0.363**
	3.665	-0.607	0.369	19.519	-4.206	17.689
- of which *ΔStock*	**0.934**	0.018	0.013	**0.155**	**-0.004**	**0.355**
	3.457	0.647	0.419	16.384	-4.135	17.097
- of which *ΔCreditors*	**-1.656**	0.028	0.018	**0.193**	**-0.004**	**0.286**
	-4.677	0.759	0.575	16.756	-3.526	12.434
DEP	**-2.624**	**-0.030**	**0.156**	**0.071**	**-0.001**	**0.124**
	-21.617	-2.389	5.709	24.208	-2.093	4.381
SPEC	**-1.597**	**-0.052**	**0.254**	**0.069**	0.001	**0.076**
	-10.474	-3.249	10.553	19.975	1.601	2.563
Relatives						
ORD / OCF	-0.022	**-0.048**	**0.536**	**0.404**	**0.005**	**0.620**
	-0.290	-5.890	35.760	58.870	7.113	50.580
EARN / OCF	**-0.533**	**-0.054**	**0.531**	**0.516**	**0.011**	**0.831**
	-6.091	-5.921	35.061	62.093	12.327	151.959
ΔWCAP / OCF	0.123	**-0.020**	**0.231**	**0.721**	**-0.005**	**0.461**
	2.005	-3.055	9.330	78.622	-5.152	26.550
SPEC / OCF	**-1.079**	**-0.025**	**0.150**	**0.321**	**0.009**	**0.808**
	-10.771	-2.336	5.460	44.097	11.417	130.330

Notes. The estimated regressions are: $est(statistic_{ijt}) = \tau_{1ij} + \tau_{2ij} T + \xi_{ijt}$ where $statistic_{ijt}$ is either the cross-sectional skewness or the standard deviation statistic denoted by *j*, *i* is one of the ten dependent variables and four relatives of these variables and *T* denotes technical time *T*= (-16,...0,+16). Below each of the τ_{1ij} and τ_{2ij} coefficients is the time-trend *t*-statistics and below the R^2s is the *F*-statistic. Boldfaced estimates are significant at 5% or better (critical values are $t_{c,\alpha=0.05}$(31 d.f.)= 2.040 and $F_{c,\alpha=0.05}$(1 d.f.,31 d.f.)= 4.160. Relatives are defined as $Relative = statistic_{ijt}(variable_A) / statistic_{ijt}(variable_{OCF})$.

The table also includes some of the more important relative skewness and standard deviations measures discussed above.

Overall, the time-series changes in cross-sectional estimates of the parameters in the contemporaneous model and some descriptive statistics provide some supporting evidence consistent with increasing ex-post accounting conservatism through time. In particular, the sensitivity of earnings after extraordinary and exceptional items (*EARN*) and of the accruals associated most with accounting conservatism (*SPEC*) to bad news is increasing. Time-series changes in some of the descriptive statistics of accounting variables and in particular the relatives of most of the cum-accruals accounting variables are also consistent with increasing accounting conservatism through time. Most notably, there is a significant trend in increasing skewness of *ΔWCAP* and *SPEC*, the two main types of accruals used in this study, relative to skewness in *OCF* (and also in the absolute sense). This is complemented by increasing variability of *SPEC*, either in the absolute or relative sense. However, there is some evidence of decreasing variability (e.g., of the *ΔWCAP* variable). Thus, while the evidence presented above supports the conclusion of increasing conservatism through time, the evidence is much less persuasive than in the comparable US research indicates (e.g., Klein and Marquardt, 2002; Givoly and Hayn, 2000).

4.6 LAGGED MODELS OF ACCOUNTING CONSERVATISM

Pope and Walker (1999) extend their contemporaneous model of accounting conservatism to study the speed with which prior periods' news flow through to earnings. The number of previous periods is limited to three lags. This is because existing research has shown that prices lead earnings by up to three periods (e.g., Kothari and Sloan, 1992) and Donnelly and Walker (1995) for the UK indicate that it might be shorter. In this section, accounting earnings is decomposed, as in the contemporaneous models, into its operating cash flows and accruals components and use each of these variables in deflated, per share form as dependent variables in lagged Pope and Walker (1999) models of accounting conservatism. The model presented in section 3.4 is operationalised as follows:

$$\frac{X_t}{P_{t-4}} = \alpha_1 + \alpha_2 D_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \beta_{\tau+1} PET_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \gamma_\tau D_{t-\tau,t-\tau-1} PET_{t-\tau,t-\tau-1} + e_t \qquad (4\text{-}19)$$

Under conservative accounting, the estimated good news coefficients $\hat{\beta}_1$ to $\hat{\beta}_4$ are expected to increase monotonically towards the cost of capital ($1/k$), while the coefficient $\hat{\gamma}_1$ should immediately capture the effect of current-period bad news, but the estimated incremental bad news coefficients $\hat{\gamma}_2$ to $\hat{\gamma}_4$ should all equal zero (or are at least expected to decay towards zero relatively quickly). As with the contemporaneous versions, the total response to bad news in period ($t-\tau$, $t-\tau-1$) is given by the sum $(\hat{\beta}_{\tau+1} + \hat{\gamma}_{\tau+1})$ and $abs(\hat{\beta}_{\tau+1} + \hat{\gamma}_{\tau+1}) > abs(\hat{\beta}_{\tau+1}) > 0$.

All models are shown in both restricted and unrestricted versions, the restrictions referring, as earlier, to whether the models allow for the incremental effects between bad and good (lagged) economic news. In the restricted version, the α_2 and γ_1 to γ_4 are restricted to zero. If asymmetric timeliness is an important feature of a particular accounting figure, the difference in R^2s between the two versions will be significant. The significance is formally tested by employing the F-test (see section 4.5.1, equation (4-7)). Aggregate results for these F-tests are shown in Appendix G.

As in previous tables, the leftmost column of Table 4-11 shows the main components of earnings and different definitions of earnings. For each of these accounting variables, first the restricted version is presented followed by the unrestricted versions.[73] All coefficients' estimates shown are cross-sectional averages of the estimates of 33 individual yearly regressions. The t-statistics are calculated according to the Fama and MacBeth (1973) method. The second column in Table 4-11 shows the average number of observations. Given the outlier-removal criteria (see section 4.2), the average number of observations is in all ten cases 622.3 firms per year, but the actual number of observations ranges from a minimum of 276 firms in 1969 to a maximum of 777 firms in 1995 and 663 firms in year 2001, the last year included in the sample. The results are discussed by groups of variables.

Operating cash flows. The good news coefficients for the operating cash flows (OCF) $\hat{\beta}_1$ to $\hat{\beta}_4$ increase monotonically through time, as expected. There is no asymmetric timeliness in OCF in respect to bad news either in the current period or

[73] The restricted versions are not commented separately and are presented only to provide comparability with other results in this thesis and other exsiting literature.

at any of the three lags, consistent with conservatism being an accruals rather than a cash flow phenomenon. Also consistent with contemporaneous results is the much lower R^2 compared to the earnings' equations. Further confirmation that asymmetric timeliness is not a feature of operating cash flows is that the F-test indicates statistically significant differences only in 9 out of 33 years. Appendix F (Table F-3) also presents results for the net change in cash (*ΔCASH*) variable with the differences entirely in the spirit of the contemporaneous models.

Earnings. Starting with the earnings after extraordinary and exceptional items (*EARN*) and good economic news, the results show that the estimated good news coefficients $\hat{\beta}_1$ to $\hat{\beta}_4$ increase monotonically towards the cost of equity capital as the lag increases. More and more of the original good news is realised and incorporated into financial statements, the coefficients increase towards the cost of capital and the difference between reported and permanent earnings due to conservative accounting gradually decreases to zero. The incremental coefficients on bad news, on the other hand, decay monotonically towards zero and by lag three the incremental coefficient $\hat{\gamma}_4$ is statistically insignificantly different from zero, as expected – bad news originating from previous periods has already been fully impounded in accounting earnings. This is consistent with most of the effects of bad news being incorporated in earnings in the period they occur. The R^2 for the unrestricted model is higher than for the restricted model and the difference is statistically significant in 26 individual cross-sections, indicating the importance of the asymmetric-timeliness effect in *EARN*. Very similar results are also obtained for the *ORD* earnings measure, except that the R^2 is higher, indicating less transitory elements are likely being present in this measure than in *EARN*, as in contemporaneous models. One important difference between these results and the UK cross-sectional results obtained by Pope and Walker (1999, Table 6) is that they obtain statistical significance on the bad news coefficients only up to and including lag one (i.e., two periods) for both their *ORD* and *EARN* variables, while here statistical significance for the current period and two lags is obtained. Their results are more in line with expectations under conservative accounting. This might be due to different sample coverage in terms of years covered and in terms of sample composition in terms of descriptive statistic, but might also be due to a partial overlap of sample years. It must be reiterated that the length of a particular accounting year is allowed to differ from one calendar year by up to ±3 months, thus causing partial overlap in adjacent calendar years. Even without this difference, another important contribution to this difference might be the fact that non-December year-ends are allowed in the sample, thus automatically causing one accounting year to extend over two calendar years.

Regarding operating profit (*OP*), the results for good news are consistent with the results for the other two earnings measures, i.e., the good news coefficients increase monotonically towards the cost of capital, while for the bad news only the current-period bad news coefficient $\hat{\gamma}_1$ is statistically significant, indicating that to the extent that the accruals' components in this measure capture (some of) the effect of bad news, it is incorporated immediately in the period it occurs. This measure is least likely to include any non-operating accruals. This should be mirrored by working capital accruals (*ΔWCAP*) (see below). Also, of the three earnings measures, the unrestricted versions differ in statistical terms in only 17 years, as opposed to the *EARN* regressions (26 years).

Accruals. The asymmetric timeliness exhibited by the earnings figures is thus ascribed to the accruals components of earnings, given that the cash flows measures indicate no asymmetry in recognition of good and bad news in these figures.[74] As an aggregate measure, working capital accruals (*ΔWCAP*), captures the effects of current bad news within the period it occurs and no further lags are statistically significant, consistent with predictions under conservative accounting. Further decomposition of *ΔWCAP* into its constituent parts reveals that this asymmetry is in a significant part due to the *ΔStock* component (also see Thomas and Zhang, 2002). Inconsistent with the requirement of conservatism that all bad news must be impounded immediately in the earnings figure, both the current ($\hat{\gamma}_1$) and lag one ($\hat{\gamma}_2$) incremental bad news coefficients on this component are statistically significant. Again, the caveat is that this might be a consequence, at least in part, of sample construction. The incremental coefficients on current bad news ($\hat{\gamma}_1$) on the other two *ΔWCAP* components are not statistically significant. For completeness, note that the lag-one good news coefficient $\hat{\beta}_2$ is the highest of all four good news coefficients in aggregate working capital accruals as well as in its debtors and creditors components. This finding is inconsistent with the expectations derived from the model that the coefficients on good news should increase monotonically towards the cost of capital. Additional checks have been performed to ensure this is not a result of data or programming irregularities.

The good news coefficients in the depreciation and amortisation expense (*DEP*) equation increase monotonically and none of the bad news coefficients are

[74] Basu (1997) and Ball, Kothari and Robin (2000) do not study these accruals explicitly and this thesis thus represents an important extension of these two studies.

statistically significant, consistent with expectations regarding this type of accruals (the exception is the last incremental coefficient $\hat{\gamma}_4$, which is marginally statistically significant, but this significance would be hard to explain in economic terms). In this respect it is interesting to note that the current-period good news coefficient $\hat{\beta}_1$ is not statistically significant, suggesting a delay in incorporating the effects of good news in earnings via depreciation. This suggests that the "implementation" of good news via investments in the stock of tangible and intangible fixed assets takes some time to be realised – the results obtained suggest an approximately one-year delay between the arrival of good economic news, an increase in the stock of fixed assets and a consequent increase in the depreciation and amortisation charge.

Perhaps the most interesting result from the lagged analysis of accruals components comes from the special items (*SPEC*). Only the estimated current-period good news coefficient $\hat{\beta}_1$ is statistically significant. It is relatively small compared to other accruals and earnings components and of the negative sign, suggesting that a unit of current-period good news results in a slight *de*crease in current-period earnings, consistent with the result obtained for the contemporaneous model. However, the effect does not persist beyond the current period, indicating that earnings-increasing *SPEC*'s effect on earnings is entirely transitory. On the other hand, the current-period, lag-one and lag-two incremental bad news coefficients are statistically significant, suggesting that firms exercise some discretion in recognising the effect of bad news in concurrent financial statements.

Table 4-11: Lagged models of accounting conservatism by earnings components, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
Operating cash flows												
OCF	622.3	0.247		0.085	0.078	0.117	0.152					0.169
		16.684		8.611	10.881	13.562	12.638					15.872
	622.3	0.256	-0.013	0.074	0.076	0.122	0.160	0.033	0.023	-0.011	-0.043	0.183
		16.150	-1.374	5.993	7.828	7.293	9.775	1.479	0.889	-0.444	-1.682	17.450
Earnings												
OP	622.3	0.213		0.117	0.131	0.140	0.152					0.369
		11.861		9.742	10.705	12.611	11.979					21.890
	622.3	0.241	-0.029	0.092	0.128	0.140	0.172	0.070	0.036	0.017	-0.022	0.385
		11.439	-3.034	7.690	8.575	10.700	8.566	3.193	1.725	0.933	-0.966	24.547
ORD	622.3	0.097		0.073	0.078	0.079	0.082					0.402
		14.246		12.535	13.681	16.952	15.251					21.893
	622.3	0.121	-0.017	0.052	0.071	0.075	0.095	0.054	0.044	0.035	0.008	0.426
		16.062	-4.204	8.647	9.306	10.816	9.867	4.846	4.118	3.029	0.640	24.480
EARN	622.3	0.089		0.080	0.085	0.080	0.085					0.333
		11.510		13.151	14.838	15.489	16.441					24.648
	622.3	0.125	-0.025	0.048	0.076	0.076	0.105	0.077	0.061	0.055	0.014	0.362
		15.403	-4.790	6.904	9.814	11.231	11.793	6.039	5.508	4.527	1.082	27.893
Accruals												
ΔWCAP	622.3	0.049		0.040	0.066	0.049	0.037					0.068
		4.388		7.500	8.394	6.516	3.799					13.191
	622.3	0.070	-0.021	0.020	0.066	0.044	0.049	0.035	0.007	0.019	0.006	0.081
		4.599	-2.838	2.516	6.307	2.673	2.365	2.096	0.462	0.787	0.258	13.961
ΔWCAP components:												
- of which *ΔDebtors*	622.3	0.057		0.052	0.066	0.054	0.033					0.088
		6.079		10.727	8.477	5.594	3.746					11.981
	622.3	0.055	-0.004	0.043	0.074	0.057	0.042	0.022	-0.026	-0.036	-0.027	0.102
		4.938	-0.803	5.784	6.896	3.756	2.662	1.105	-1.130	-1.579	-1.358	12.704

Cont.

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
- of which *ΔStock*	622.3	**0.050**		**0.047**	**0.062**	**0.039**	**0.036**					**0.068**
		4.293		7.803	7.259	4.970	4.254					10.640
	622.3	**0.070**	-0.021	**0.027**	**0.051**	**0.043**	**0.053**	**0.038**	**0.037**	0.016	-0.035	**0.083**
		3.947	-1.773	2.182	4.375	2.986	2.880	2.139	2.139	0.644	-1.169	12.484
-of which *ΔCreditors*	622.3	**-0.058**		**-0.059**	**-0.062**	**-0.044**	**-0.033**					**0.067**
		-5.713		-9.234	-7.103	-4.318	-3.472					11.347
	622.3	**-0.055**	0.004	**-0.050**	**-0.059**	**-0.056**	**-0.046**	-0.025	-0.004	0.040	**0.068**	**0.081**
		-4.120	0.480	-5.482	-4.322	-3.572	-2.839	-0.980	-0.146	1.649	2.031	12.676
DEP	622.3	**-0.089**		**-0.008**	**-0.014**	**-0.027**	**-0.038**					**0.084**
		-15.867		-4.508	-7.138	-9.943	-12.739					10.969
	622.3	**-0.091**	0.006	-0.004	**-0.015**	**-0.027**	**-0.040**	0.001	0.007	0.008	**0.018**	**0.094**
		-12.723	1.159	-0.805	-5.144	-4.889	-7.952	0.104	1.267	1.105	2.388	12.263
SPEC	622.3	**-0.007**		0.002	0.003	-0.001	0.002					**0.033**
		-2.447		0.791	0.780	-0.327	0.821					8.751
	622.3	**0.006**	**-0.007**	**-0.008**	0.002	-0.004	0.010	**0.029**	**0.021**	**0.028**	0.017	**0.054**
		2.427	-2.636	-2.891	0.487	-1.053	1.786	5.574	3.053	3.369	1.722	14.561

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1}PET_{t,t-1}+\gamma_2 D_{t-1,t-2}PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3}PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4}PET_{t-3,t-4}+\varepsilon_t$ where X_t is an undeflated dependent variable listed in the leftmost column of table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $PET_{t,t-1} = (P_t - P_{t-1})/P_{t-4}$ and $D_{t-\tau,t-\tau-1} = \{1 \text{ if } PET_{t-\tau,t-\tau-1} \leq 0;\ 0 \text{ otherwise}\}$. All dependent variables are deflated by opening share price P_{t-4}. *Avg. n* is the average number of observations per year. All estimates and R^2s are cross-sectional averages for the period 1969–2001 and associated t–statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1 = 32 d.f., i.e., $|t|>2.0369$.

This is, strictly speaking, inconsistent with the models of conservatism that "require" immediate and full incorporation of bad news in the current period (and allow for possible over-incorporation). It is also inconsistent with regulatory calls for more (earnings) timeliness, in particular regarding bad economic news (Levitt, 1998). They would, however, fit with the earnings management literature. For example, it is not inconceivable that management would spread the effect of a bad news over two adjacent accounting periods to smooth earnings (e.g., Leuz, Nanda and Wysocki, 2003; Burgstahler and Dichev, 1997; Elliott and Waymire, 1988) or they might reflect some industry-specific circumstances or managers, auditors and legal advisers financial reporting preferences (Francis, Hanna and Vincent, 1996; Elliott and Hanna, 1996). Also, the significance of these lags exactly corresponds with significance of the bad news coefficients in the *ORD* and *EARN* measures. Thus, while these statistical significances might be due to sample properties, they are also consistent with other explanations, earnings management among them.

To sum up, lagged analysis shows that there is no asymmetry in operating cash flows at any lag. The asymmetric timeliness of earnings in respect to bad news extends over more lags with increasing content of accruals. In particular, while working capital accruals exhibit asymmetric timeliness in incorporating current-period bad news, current-period special items reflect bad news from up to two lags. While the statistical significance of lagged coefficients is, strictly speaking, not consistent with conservatism, the statistical insignificance of lag-three bad news coefficients show that any deviations are limited in time.

4.7 THE EFFECTS OF PERSISTENCE ON THE CONTEMPORANEOUS MODELS OF CONSERVATISM

The effect of persistence on contemporaneous models of conservative accounting is studied empirically by estimating the following operationalisation of the model presented in section 3.8:

$$\frac{X_t}{P_{t-1}} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \\ + \delta_1 L_{t-1} + \delta_2 \frac{X_{t-1}}{P_{t-1}} + \delta_3 L_{t-1} \frac{X_{t-1}}{P_{t-1}} + \varepsilon_t \qquad (4\text{-}20)$$

At least three observations regarding the inclusion of persistence terms that help model the V_t-term in the Pope and Walker (1999) model can be made. First, if the inclusion of differential profit/loss or any positive/negative accounting figure persistence represents an (imperfect) attempt to model the V_t-term in equation (3-9) and this effect of previous periods' news through conservative accounting on current accounting numbers is significant, the average estimated regression constants from the two models should differ materially between the two sets of results. In particular, the estimated regression constants from augmented regressions should be lower on average, as these past effects are separated from the cost of capital (and, potentially, other unaccounted-for systematic effects). Second, the estimated $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients that capture the incorporation of current period news into current period accounting numbers should not be materially affected. By definition, current-period news is not correlated with previous periods' news (all are proxied for by ex-dividend returns). This also implies that the interpretations of the conservatism measures based on the model in equation (4-20) are identical to interpretations elsewhere in this study. Third, the R^2s in these models should increase either because of (a successful) modelling of the V_t term or because the inclusion of these δ_1-δ_3 terms captures factors, described by the accounting losses literature (e.g., Jan and Ou, 1995; Hayn, 1995; Berger, Ofek and Swary, 1996; Freeman and Tse, 1992; Lipe, Bryant and Widener, 1998; Burgstahler and Dichev; 1997; etc.).

The results are presented below. Both the variant where the L_{t-1} variable is defined by earnings after extraordinary and exceptional items (*EARN*) for all different dependent variables and the variant where the L_{t-1} indicator (as well as the persistence variables) are redefined separately for each of the main variables used in this study are shown. Table 4-12 shows the results for the first variant. The three expectations presented above are supported. Regression constants appear to be materially lower, on average, compared to models that do not allow for persistence – i.e., that do not model the V_t term. The only exception is the constant in the *SPEC* regression, but even this exception is an exception in statistical, rather than economic terms. The coefficients on good and bad news in all ten regressions are not materially affected. On average, both the estimated good news coefficients $\hat{\beta}_1$ and the incremental bad news coefficients $\hat{\gamma}_1$ appear to be marginally lower. This might be a consequence of imperfect modelling of the V_t term that would introduce the errors-in-variables problem and bias all regression coefficients towards zero. The average R^2s are significantly higher (almost double) the size of R^2s in regressions without the δ_1-δ_3 terms.

Overall, operating cash flows (*OCF*) capture news symmetrically. All three earnings measures capture bad news significantly faster than good news and the asymmetry is highest for the *EARN* measure, followed by the *OP* measure and by ordinary earnings (*ORD*). The analysis of accruals shows that most of the asymmetry exhibited by earnings can be attributed to working capital accruals (*ΔWCAP*) and special items (*SPEC*). The observations on the relative values of the R^2s in accruals versus cash flows specifications apply, too. These results are thus in line with the contemporaneous results presented in section 4.5.

The second variant (Table 4-13), where both the L_{t-1} indicator and the (lagged) persistence variables are defined separately for each earnings and earnings' components variable, are quantitatively and qualitatively very similar to the "bottom-line" variant. Operating cash flows (*OCF*) capture news symmetrically, all three earnings measures exhibit a significant asymmetry in capturing bad news and the asymmetry is highest for the *EARN* measure, followed by the *OP* measure and by ordinary earnings (*ORD*), as in a number of previous analyses. The analysis of accruals shows that most of the asymmetry in earnings can be attributed to working capital accruals (*ΔWCAP*) and special items (*SPEC*). The effects of deprecation accruals (*DEP*) cannot be studied in this variant, but it is unlikely given previous results that it would affect the asymmetric timeliness of earnings significantly.

An alternative modelling of the V_t term is to include past periods' economic news (i.e., price-differences deflated by P_{t-1}) into the contemporaneous model of conservatism in place of the δ_1–δ_3 terms above. Pope and Walker (1999) include

Table 4-12: Persistence (net income profit/loss observations) as a model of the V_t term in contemporaneous Pope and Walker (1999) model by earnings' components, 1969-2001

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\delta}_1$	$\hat{\delta}_2$	$\hat{\delta}_3$	R^2
Operating cash flows									
OCF	769.2	**0.145**	-0.001	**0.081**	0.039	**0.121**	**0.796**	0.239	**0.141**
		11.119	-0.120	**7.951**	1.703	**4.335**	**9.679**	0.220	**13.038**
Earnings									
OP	769.2	**0.131**	-0.005	**0.078**	**0.113**	**0.045**	**0.776**	0.268	**0.327**
		9.951	-1.101	**7.338**	**6.244**	**2.190**	**8.650**	0.271	**16.816**
ORD	769.2	**0.060**	0.000	**0.049**	**0.092**	-0.008	**0.432**	0.200	**0.398**
		10.756	-0.227	**12.113**	**10.105**	-0.683	**8.759**	0.353	**18.156**
EARN	769.2	**0.055**	0.002	**0.049**	**0.139**	**-0.030**	**0.455**	0.153	**0.347**
		10.016	0.928	**13.675**	**11.532**	**-2.284**	**8.960**	0.276	**14.825**
Accruals									
ΔWCAP	769.2	**0.035**	-0.003	0.008	**0.073**	**-0.028**	**0.199**	**-0.228**	**0.046**
		6.393	-0.986	0.941	**3.775**	**-2.760**	**4.169**	**-2.051**	**8.783**
ΔWCAP components:									
- of which *ΔDebtors*	769.2	**0.053**	0.001	**0.029**	**0.076**	0.001	0.089	0.270	**0.049**
		9.917	0.344	**4.939**	**3.732**	0.037	1.722	1.190	**9.103**
- of which *ΔStock*	769.2	**0.042**	-0.004	**0.023**	**0.042**	**-0.024**	**0.168**	0.128	**0.054**
		5.293	-1.110	**3.439**	**2.573**	**-2.662**	**3.656**	0.530	**8.736**
-of which *ΔCreditors*	769.2	**-0.060**	-0.001	**-0.044**	**-0.046**	-0.004	-0.058	-0.626	**0.047**
		-7.435	-0.276	**-7.503**	**-2.253**	-0.275	-1.089	-1.144	**9.860**
DEP	769.2	**-0.049**	-0.001	**-0.010**	0.000	**-0.050**	**-0.242**	**0.282**	**0.108**
		-13.305	-0.306	**-2.889**	-0.078	**-9.117**	**-10.449**	**10.897**	**15.657**
SPEC	769.2	**-0.006**	0.002	**-0.007**	**0.049**	**-0.018**	**0.033**	-0.050	**0.054**
		-2.608	1.681	**-2.228**	**6.334**	**-2.387**	**2.957**	-1.712	**7.003**

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{i,t-1}+\beta_1 RET_{i,t}+\gamma_1 D_{i,t-1}RET_{i,t}+\delta_1 L_{t-1}+\delta_2(X_{t-1}/P_{t-1})+\delta_3 L_{t-1}(X_{t-1}/P_{t-1})+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{i,t-1}= (P_t-P_{t-1})/P_{t-1}$ and $D_{i,t-1}=\{1$ if $RET_t \leq 0$ and 0 otherwise$\}$. L_{t-1} is a dummy variable, defined as $L_{t-1}= \{1$ if $EARN_{t-1} \leq 0$ and 0 otherwise . All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$.

Table 4-13: Persistence (individual variables' positive/negative observations) as a model of the V_t term in contemporaneous Pope and Walker (1999) model by earnings' components, 1969-2001

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\delta}_1$	$\hat{\delta}_2$	$\hat{\delta}_3$	R^2
Operating cash flows									
OCF	621.8	**0.127**	0.009	**0.088**	0.049	**0.092**	**0.434**	**-0.205**	**0.246**
		11.923	1.241	**7.939**	1.813	**4.618**	**17.727**	**-2.550**	**19.305**
Earnings									
OP	769.3	**0.086**	0.000	**0.075**	**0.107**	**0.083**	**0.615**	-0.053	**0.523**
		8.641	-0.021	**9.395**	**5.761**	**3.092**	**12.160**	-1.513	**21.089**
ORD	769.3	**0.041**	0.000	**0.046**	**0.085**	0.014	**0.649**	0.045	**0.488**
		7.533	-0.111	**14.429**	**9.134**	0.436	**14.348**	0.080	**25.060**
EARN	769.2	**0.055**	0.002	**0.049**	**0.139**	**-0.030**	**0.455**	0.153	**0.347**
		10.016	0.928	**13.675**	**11.532**	**-2.284**	**8.960**	0.276	**14.825**
Accruals									
ΔWCAP	768.8	**0.052**	-0.001	0.014	**0.092**	-0.004	0.039	-0.041	**0.039**
		6.832	-0.220	1.768	**4.880**	-1.188	1.420	-1.103	**6.807**
ΔWCAP components:									
- of which *ΔDebtors*	768.8	**0.053**	0.006	**0.031**	**0.094**	0.009	0.058	**-0.109**	**0.061**
		7.889	1.288	**5.684**	**3.984**	1.767	1.583	**-2.178**	**8.351**
- of which *ΔStock*	769.0	**0.050**	-0.001	**0.028**	**0.062**	**0.010**	**0.116**	-0.055	**0.067**
		5.536	-0.417	**4.078**	**3.978**	**2.132**	**3.034**	-0.952	**9.312**
-of which *ΔCreditors*	769.0	**-0.055**	-0.005	**-0.044**	**-0.065**	-0.011	-0.041	0.139	**0.055**
		-6.848	-1.258	**-6.491**	**-2.870**	-1.353	-1.239	1.704	**10.764**
SPEC	766.5	**0.004**	0.002	**-0.007**	**0.047**	**-0.017**	**0.223**	**-0.148**	**0.117**
		2.943	1.850	**-2.121**	**5.766**	**-8.437**	**4.489**	**-2.469**	**7.490**

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-}+\gamma_1 D_{t,t-1}RET_{t,t-}+\delta_1 L_{t-1}+\delta_2(X_{t-1}/P_{t-1})+\delta_3 L_{t-1}(X_{t-1}/P_{t-1})+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts and *SPEC* is special items, $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=\{1$ if $RET_{t,t-1}\leq 0$ and 0 otherwise$\}$. L_{t-1} is a dummy variable, defined as $L_{t-1}=\{1$ if $X_{t-1}\leq 0$ and 0 otherwise . All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e.,$|t|>2.0369$. *DEP* is omitted from analyses as it can only take negative values.

news from three lags, obtaining a variant of the lagged model presented in section 4.6. The principal expectations from this formulation is that the estimated regression coefficients should not be materially affected by this inclusion given that news should be uncorrelated across time and that the R^2s should increase, given that the regression error term contains the deflated V_t term. However, recently, Ryan and Zarowin (2003) ascribe differences between lagged models deflated by P_{t-1} compared to models deflated by P_{t-4} to interest rates. This issue is not studied here, but some related results are presented in Appendix D (Table D-2). While the results are sensitive to the choice of deflators (in particular the coefficients on lagged good news $\hat{\beta}_2$ to $\hat{\beta}_4$), the principal conclusions regarding contemporaneous terms (represented by coefficients $\hat{\beta}_1$ and $\hat{\gamma}_1$) are the following.

Operating cash flows (*OCF*) does not exhibit asymmetric timeliness in incorporating bad news. Of the earnings figures, *EARN* exhibits the highest asymmetric timeliness, followed by *OP* and by *ORD*. Compared to the contemporaneous results without the V_t-term modelling, the $\hat{\gamma}_1$ coefficients on the latter two figures are lower, while for the *EARN* figure the estimated bad news coefficient is higher than in the contemporaneous versions (compare with Table 4-8). This asymmetry is clearly reflected in working capital accruals (*ΔWCAP*) and its three components. All coefficients are of expected magnitudes and signs. The other important accruals component reflecting news in an asymmetric manner is the special items variable (*SPEC*). Results on the total accruals variable reinforce the conclusion reached in earlier sections. The modelling of the V_t term thus does not affect qualitatively the current-period coefficients $\hat{\beta}_1$ and $\hat{\gamma}_1$ and the R^2s increase compared to contemporaneous models.[75]

4.8 A COMPARISON OF LOSS AND PROFIT OBSERVATIONS

4.8.1 A short introduction

Empirical studies on earnings response coefficients have documented that the relationship between accounting earnings and market values is different for firms with current-period positive earnings relative to firms with current-period negative earnings. Taking a somewhat different perspective than in section 2.2.4, the earnings response coefficients for observations with positive earnings were found to be much higher than earnings response coefficients for observations with negative earnings. Jan and Ou (1995) argue that this difference is due to losses being more transitory than profits, since losses cannot persist indefinitely. Losses are either reversed or shareholders exercise the put option they implicitly have in the firm and eliminate the firm's operations (Hayn, 1995; Berger, Ofek and Swary, 1996; Collins, Pincus and Xie, 1999). This put option can take the form of the liquidation of assets, reorganisation of the firm or the assets might be merged with or acquired by another firm. These differences between profit and loss observations cannot be explained by firm-specific factors or by observed non-linearities in extremities of earnings, but

[75] It is unclear whether lagged bad news coefficients may be interpreteded in the same way as in the lagged model of conservatism, but with a different deflator. If this were the case, the significance and magnitude of lagged bad news coefficients in earnings and *SPEC* regressions are consistent with findings from section 4.5.1 (see the effects of deflation by varying deflators in Appendix B, Table B-3).

represent a distinct factor in the returns-earnings relation (Freeman and Tse, 1992; Lipe, Bryant and Widener, 1998) The existing literature does not provide a definite guidance towards whether the difference occurs at exactly zero earnings level or at some other level of earnings. This relates in particular to contractual effects of accounting numbers: it is, for example, conceivable that pre-managed negative earnings are inflated by management adopting income-increasing accounting policies or that low levels of positive earnings are sufficiently low such that the abandonment option becomes "in the money" (Burgstahler and Dichev, 1997). Regardless of the view taken/explanation accepted, these findings are consistent in suggesting that the nature (and with it the estimated regression slope) of the returns-earnings relationship changes significantly around the break-even level of earnings. A further layer is added in this analysis by Beaver, McAnally and Stinson (1997) who show in a simultaneous-regression approach, that both returns determine changes in earnings and changes in earnings determine returns.

In an attempt to show and capture possible differences between profit and loss firms in terms of accounting conservatism, the main descriptive statistics and correlations separately for profit and loss observations and test formally for the differences between the two groups are shown first. Next, the Pope and Walker (1999) model of conservatism is expanded by additional terms that allow the differentiation between good and bad economic news as well as between profit and loss observations. Third, the contemporaneous Pope and Walker (1999) models of earnings conservatism are estimated separately for profit and loss observations. Moreover, the *EARN*-regressions are estimated separately for positive and negative levels of operating cash flows and positive and negative levels of accruals. Fourth, the results of the direct tests of the absolute-value extension of Pope and Walker (1999) are presented. The section concludes with a condensed discussion of econometric problems associated with these direct tests that partially help to explain the observed results and, more generally, that help motivate the structure of and tests taken in this section.

4.8.2 General properties of loss and profit observations

This section presents some descriptive statistics about observations with negative and positive earnings after extraordinary and exceptional items (*EARN*). It also presents formal tests of the differences in terms of descriptives for the two groups. Table 4-14 shows the contemporaneous incidence of both good/bad economic news and profit/loss observations.

Table 4-14: Incidence of good and bad economic news and positive and negative earnings (*EARN*), contemporaneous sample, 1969-2001

		Economic news					
		Good (RET_t>0)		Bad (RET_t≤0)		Total	
Reported earnings	Positive ($EARN_t$>0, L_t=0)	13,481	52.07%	9,170	35.42%	**22,651**	**87.50%**
	Negative ($EARN_t$≤0, L_t=1)	974	3.76%	2,263	8.74%	**3,237**	**12.50%**
Total		**14,455**	**55.84%**	**11,433**	**44.16%**	**25,888**	**100.00%**

Notes. *EARN* is earnings after extraordinary and exceptional items, returns are defined as $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$. Percentages shown are of total number of observations. *EARN* and *RET* relate to the same (current) period, i.e., earnings are not lagged.

Overall, 12.5% of observations in the contemporaneous sample have negative earnings *EARN* and 44.16% exhibit negative returns *RET*.[76] A mere 6.74% of firms with positive *RET* exhibit a loss (only 3.76% of all observations). In contrast, almost 20% of firms with negative *RET* also show a loss. These data suggest that while negative accounting earnings (an alternative nomenclature might be "accounting bad news") are a distinct phenomenon from negative economic earnings, the two phenomena overlap in a significant number of cases. This is consistent with the observation that both "types" of earnings reflect the same underlying economic event. Indeed, a more general statement that might be derived directly from accounting conservatism literature is that bad news cause accounting losses in that they must be recognised in the current accounting period and in full amount rather than gradually over time and in small amounts.

Table 4-15 reports Pearson's bivariate correlation coefficients separately for the current-period profit observations and current-period accounting loss observations, the profit and loss observations being separated according to the sign earnings after extraordinary and exceptional items (*EARN*), i.e., the figure that resembles most closely the "bottom-line" earnings. Some of the main points are the following. First, the higher the operating cash flows *OCF*, the lower (possibly more negative) the total accruals (*Accruals* (*tot.*)). The correlation coefficient is stronger in magnitude for loss observations, indicating the important role of accruals for loss firms in particular. This relation also holds for certain individual components of accruals (*ΔWCAP*, *ΔDebtors*, *ΔStock* and *SPEC*), except for the depreciation charge

[76] Section 4.2 presents details on contemporaneous sample formation.

(*DEP*), where the correlation coefficients are similar between the two groups, and *ΔCreditors*.

Second, the relation between *OCF* and *EARN* appears to be fundamentally different for the two groups of observations. For the profit group, there is a strong and positive linear correlation between all three earnings figures and operating cash flows – the higher the *OCF* component, the higher the earnings. The relation between *EARN* and *OCF* is somewhat weaker than the correlation between the ordinary earnings figure *ORD* and *OCF*, likely a consequence of the presence of more transitory (accrual) items in *EARN* than in *ORD*. The relation is strongest for the *OP* measure of earnings that likely contains the least amount of non-operating accruals. For the loss group, however, these relations are different. While there is a strong correlation between *OCF* and operating profit (*OP*), the correlation is much weaker with ordinary earnings (*ORD*) and, finally, the sign of the correlation changes when the *EARN* measure is considered. Thus, the higher the operating cash flow component of earnings, the lower the "bottom-line" earnings figure. This should be reflected in a strong and negative correlation between *OCF* and special items (*SPEC*) and other accruals that possibly contain items that cause a lowering of earnings. The correlation coefficients between *OCF* and *SPEC* as well as other accruals are all relatively strong and negative, particularly for the loss group.

Table 4-15: Pearson's bivariate correlation coefficients for the contemporaneous sample split by the sign of current-period earnings after extraordinary and exceptional items (*EARN*), 1969-2001

	OCF	*OP*	*ORD*	*EARN*	*ΔWCAP*	*ΔDebtors*	*ΔStock*	*ΔCreditors*	*DEP*	*SPEC*	*Accruals (tot.)*	$RET_{t,t-1}$
	PROFIT OBSERVATIONS ($EARN_t$>0, n=22,651)											
OCF		0.672	0.569	0.520	-0.411	-0.091	-0.120	-0.161	-0.623	-0.127	-0.672	0.237
OP	0.636		0.872	0.795	0.345	0.286	0.369	-0.267	-0.516	-0.207	0.043	0.311
ORD	0.227	0.667		0.888	0.290	0.242	0.315	-0.229	-0.395	-0.152	0.059	0.383
EARN	-0.166	0.167	0.499		0.271	0.215	0.289	-0.201	-0.381	0.189	0.151	0.360
ΔWCAP	-0.651	0.082	0.226	0.267		0.501	0.621	-0.120	-0.093	-0.089	0.854	0.061
ΔDebtors	-0.165	0.107	0.100	0.113	0.373		0.317	-0.712	-0.142	-0.083	0.377	0.098
ΔStock	-0.420	*0.006*	0.175	0.211	0.586	0.211		-0.587	-0.120	-0.118	0.486	0.077
ΔCreditors	-0.052	*-0.030*	-0.040	-0.046	*0.026*	-0.711	-0.489		0.145	0.095	-0.022	-0.098
DEP	-0.583	-0.350	*0.015*	0.246	0.107	-0.062	0.086	0.070		0.056	0.341	-0.150
SPEC	-0.376	-0.431	-0.349	0.607	0.069	*0.012*	0.065	*-0.006*	0.230		0.247	-0.075
Accruals (tot.)	-0.831	-0.262	*-0.001*	0.557	0.773	0.248	0.473	0.039	0.518	0.597		-0.029
$RET_{t,t-1}$	0.085	0.121	0.081	*0.022*	0.039	0.087	*0.020*	-0.058	-0.134	-0.051	-0.041	
	LOSS OBSERVATIONS ($EARN_t$≤0, n=3,237)											

Notes. Pearson's bivariate correlation coefficients for profit observations- (loss observations-) only above (below) the diagonal. *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock and work in progress, *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and the measure of total accruals is *Accruals (tot.)*= *ΔWCAP+DEP+SPEC*. All variables are per share and scaled by P_{t-1}, the returns variable is defined as $RET_{t,t-1}$.All coefficients are statistically significant at the 5% level, of which all coefficients in the upper-right part of the table (profit observations) significant at 1%. Italicised coefficients are not statistically significant; all appear in the bottom-left part of the table (loss observations).

Finally, the correlation between current-period returns (*RET*) and all three earnings measures is lower in magnitude for the loss group than for the profit group, albeit the correlation coefficients are of equal sign in both groups. This is consistent with empirical observations that loss firms exhibit lower earnings response coefficients than profit firms for a variety of reasons, including transitory elements and abandonment options (e.g., Jan and Ou, 1995; Hayn, 1995). Additionally, assuming Ball, Kothari and Robin (2000) view that operating cash flow is merely a noisier measure of performance than earnings (see section 3.5), the "operating cash flow" response coefficient as well as the correlation between returns and operating cash flows should be lower for loss firms. Table 4-15 confirms this expectation. The correlation is relatively low for both profit and loss firms, but the difference in magnitude between the two groups of firms appears to be material.

Table 4-16 shows the descriptive statistics for the two sub-samples and provides two formal tests of the differences in mean values of these variables. For each deflated accounting figure for the two sub-samples, the following hypothesis stated in alternative form is tested:

$$H^A: \overline{Y}_{L_t=0} - \overline{Y}_{L_t=1} \neq 0$$

where $\overline{Y}_{L_t=0}$ and $\overline{Y}_{L_t=1}$ represent mean values of deflated accounting variables listed in the leftmost column of Table 4-16. The hypothesis indicates that firms with non-negative and firms with negative earnings exhibit different values of different deflated accounting variables. A particularly interesting question in the conservatism framework is whether accounting profit and loss firms differ in terms of the accruals and operating cash flow components. The two sub-samples split by $EARN_t$ are assumed to be independent. The test statistics is (adapted from Anderson, Sweeney and Williams, 1993, pp. 347-352; also see section 4.3 above):

$$t = \frac{(\bar{Y}_{L_t=0} - \bar{Y}_{L_t=1})}{\sqrt{\frac{(n_{L_t=0} - 1)\sigma^2_{Y_{L_t=0}} + (n_{L_t=1} - 1)\sigma^2_{Y_{L_t=1}}}{(n_{L_t=0} + 1) + (n_{L_t=1} + 1)}} \cdot \sqrt{\frac{1}{n_{L_t=0}} + \frac{1}{n_{L_t=1}}}} \tag{4-21}$$

distributed with $(n_{L_t=0} + n_{L_t=1} - 2)$ degrees of freedom, where, additionally, $n_{L_t=0}$ and $n_{L_t=1}$ are the numbers of observations affected by good and bad news respectively and $\sigma^2_{Y_{L_t=0}}$ and $\sigma^2_{Y_{L_t=1}}$ are the variances of deflated accounting variables for the two sub-samples.

Additionally, the Mann-Whitney-Wilcoxon non-parametric test is employed (adapted from Anderson, Sweeney, Williams, 1993, pp. 721-727; Stata Reference Manual, 2001, pp. 219-220). The hypothesis in alternative from is:

H^A: *Two populations are not identical.*

and the test statistics is:

$$z = \frac{T - E[T]}{\sqrt{\text{var}(T)}} \tag{4-22}$$

where $T=\sum_{i=1}^{n_{GN}} R_{L_t=0,i}$ is the sum of ranks $R_{L_t=0,i}$ for positive earnings observations, $E[T]=n_{L_t=0,i}(n_{L_t=0}n_{L_t=1}+1)/2$ and $\text{var}(T)=(n_{n_{L_t=0}}n_{n_{L_t=1}}\sigma^2)/(n_{L_t=0}+n_{L_t=1})$ and σ^2 is the variance of the full contemporaneous sample ranks r_i: $\sigma^2=\frac{1}{n-1}\sum_{i=1}^{n_{n_{L_t=0}}+n_{n_{L_t=1}}}(r_i-\bar{r})^2$.

Both tests provide qualitatively equal conclusions regarding the differences in the two sub-samples of earnings. Firms with positive accounting earnings (*EARN*) have, on average, higher deflated operating cash flows (*OCF*) and also higher operating profit (*OP*) (note that both *OCF* and *OP* are positive for both profit and loss firms). However, ordinary earnings (*ORD*) are already negative, on average, for the "bottom-line" loss (L_t= 1) sub-sample. This is reflected by earnings-decreasing working capital accruals (*ΔWCAP*) and its components (except for *ΔCreditors* that are, on average, earnings-decreasing for both sub-samples, as is the depreciation charge *DEP*). However, in a significant part, the difference between profit and loss firms is due to special items (*SPEC*), the component associated with write-offs and similar one-time items. The mean (median) of these deflated special items for the loss sub-sample is a full –0.087 (–0.049) and for the profit sub-sample 0.000 (0.000). The difference is highly statistically significant using either test. A similar conclusion applies in terms of differences in total accruals (*Accruals* (*tot.*)). While overall and on average total accruals should be negative (i.e., earnings-decreasing), the average level of accruals for the loss firms is significantly more negative than that for the profit firms: –0.232 versus –0.018 for the means and –0.175 versus –0.017 for the medians of these variables.

Table 4-16: Descriptive statistics for loss and profit observations, and tests of differences, 1969-2001

Variables	Profit observations ($EARN_t>0$)					Loss observations ($EARN_t\leq0$)					Formal tests of difference		
	Mean	St Dev	Min	Median	Max	Mean	St Dev	Min	Median	Max	Mean diff.	*t*-stat.	MWW *z*-stat.
Cash flows													
OCF	0.234	0.236	-0.391	0.179	1.895	0.175	0.280	-0.393	0.121	1.882	0.059	13.003	19.318
Earnings													
OP	0.220	0.179	-0.295	0.166	1.439	0.032	0.162	-0.304	0.012	1.042	0.188	56.626	60.650
ORD	0.110	0.079	-0.275	0.091	0.615	-0.043	0.106	-0.422	-0.027	0.314	0.153	97.824	75.747
EARN	0.114	0.084	0.000	0.092	0.717	-0.132	0.131	-0.740	-0.088	0.000	---	---	---
Accruals													
ΔWCAP	0.056	0.166	-0.780	0.027	1.010	-0.050	0.187	-0.780	-0.014	0.868	0.106	33.535	33.567
- of which *ΔDebtors*	0.064	0.173	-3.545	0.030	4.766	-0.009	0.198	-1.627	0.000	2.085	0.073	22.011	29.799
- of which *ΔStocks*	0.060	0.166	-1.655	0.017	2.890	-0.033	0.183	-3.184	-0.001	1.132	0.092	29.397	35.319
- of which *ΔCreditors*	-0.067	0.201	-5.863	-0.027	3.164	-0.008	0.235	-2.185	-0.003	2.838	-0.060	-15.475	-21.405
DEP	-0.074	0.074	-0.602	-0.052	-0.002	-0.094	0.089	-0.583	-0.067	-0.002	0.020	14.134	12.434
SPEC	0.000	0.055	-0.513	0.000	0.314	-0.087	0.125	-0.567	-0.049	0.304	0.087	68.296	47.357
Accruals (total)	-0.018	0.180	-1.381	-0.017	1.001	-0.232	0.266	-1.459	-0.175	0.676	0.213	58.895	49.354
Returns													
$RET_{t,t-1}$	0.163	0.456	-0.735	0.088	2.422	-0.106	0.470	-0.735	-0.200	2.386	0.268	31.173	36.864
$D_{t,t-1}$	0.405	0.491	0.000	0.000	1.000	0.699	0.459	0.000	1.000	1.000	-0.294	-32.159	-31.536

Notes. Variables are defined as follows: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock , *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items. All variables are per share and scaled by P_{t-1} in the contemporaneous and P_{t-4} in lagged sample, $RET_{t,t-1}$ is defined as $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ in the contemporaneous sample and $D_{t,t-1}$ is a dummy variable defined as $D_{t,t-1}=\{1 \text{ if } RET_{t,t-1}\leq0; 0 \text{ otherwise}\}$. Loss and profit observations are separated by the sign of *current*-period (*not* lagged) bottom-line net income *EARN* sign. There are 9 observations in the contemporaneous sample with exactly $EARN_t=0$. These observations are included in the loss sample. MWW *z*-statistic is the Mann-Whitney-Wilcoxon *z*-statistic.

Finally, consistent with conclusions presented above in the comments to Table 4-14 and Table 4-15, the loss sub-sample of firms exhibit significantly more negative returns (i.e., bad news) on average than the profit sub-sample measured by either the mean or the median.

Taken together, the correlation matrix and descriptive evidence presented above indicates that there are important differences between profit and loss firms in terms of operating cash flow and accruals components of earnings as well as in terms of market values associated with the two groups of firms. These differences appear to relate much more strongly to (or, originate from) differences in the accruals component(s) of earnings than to the operating cash flow component. Such an observation represents and indication that incidence of losses and accounting conservatism as an accruals phenomenon are related. Negative accounting earnings after extraordinary and exceptional items ($EARN_t \leq 0$) and negative economic earnings ($RET_{t,t-1} \leq 0$) appear to overlap at least partially. In the context of conservatism, the regressions of *EARN* on *RET* run on the loss-observations sub-sample only should exhibit a stronger timeliness of earnings if only because they are more often hit by bad economic news than profit firms. However, controlling for good and bad news within profit/loss observations should lead to similar coefficients on both good and bad news. The next two sections 4.8.3 and 4.8.4 attempt to provide an answer to this question.

4.8.3 A generalised model of losses

To allow for possible differences between two different accounting conservatism regimes for profit and loss firms within the contemporaneous Pope and Walker (1999) model, the relationship between reported and permanent earnings is allowed to be different for two different "regimes", separated, in this case, by an arbitrary level of permanent earnings. The first regime is descriptive of firms with permanent earnings above a certain threshold λ, $x_t>\lambda$ and the second regime for firms where permanent earnings are below or equal to the threshold level, $x_t\leq\lambda$:

$$X_t = \begin{cases} x_t - \theta^+ e_t^+ + \gamma^+ e_t^- + V_t & if \ x_t > \lambda \\ x_t - \theta^- e_t^+ + \gamma^- e_t^- + V_t & if \ x_t \leq \lambda \end{cases} \qquad (4\text{-}23)$$

where, analogously to the model in equation (3-5), the parameters θ^+ and θ^- measure the degree of under-recognition of current good news e_t^+ and parameters γ^+ and γ^- measure the degree of over-recognition of current bad news e_t^- for the two different regimes of permanent earnings defined by the threshold level λ. Generally, the parameters for the two regimes are allowed to (but not required to) differ: $\theta^+ \neq \theta^-$ and $\gamma^+ \neq \gamma^-$. The primary motivation for such a differentiation of loss-making observations is that, on the one hand, there are no a priori reasons why there should be any differences between profit and loss observations in terms of ex-post conservatism as both set of firms must follow the same accounting conventions, while at the same time the body of empirical literature presented in section 4.8.1 consistently suggests that there may be some differences between the two groups of firms. While the model in equation (4-23) does not in itself constitute a new theoretical model, it at least allows – at least in principle – for any incremental effects of loss-making observations. Within the model it is further assumed that the nature of economic news e_t^+ and e_t^- is equal for all firms. It must be stressed that the reported earnings X_t for each of the two regimes may be positive, negative or zero without *any* reference to the value of permanent earnings x_t.

Similarly to the steps taken in Pope and Walker (1999), each of the two relations in (4-23) is deflated by the opening price p_{t-1}, the dummy variable for bad economic news D_t reintroduced, and the two good and bad news equations resulting for each of the two regimes $x_t > \lambda$ and $x_t \leq \lambda$ merged. The equations for both regimes are straightforward analogues to (3-9):

$$\frac{X_t}{p_{t-1}} = \frac{1}{k} + \frac{1-\theta^+}{k} R_t + \frac{\gamma^+ + \theta^+}{k} D_t R_t + \frac{V_t}{p_{t-1}} \tag{4-24a}$$

and for the second regime equation (4-23) becomes

$$\frac{X_t}{p_{t-1}} = \frac{1}{k} + \frac{1-\theta^-}{k} R_t + \frac{\gamma^- + \theta^-}{k} D_t R_t + \frac{V_t}{p_{t-1}} \tag{4-24b}$$

As in the good/bad news contemporaneous Pope and Walker (1999) model presented in section 3.3, the coefficient $(1-\theta_0)/k$ in either regime captures the proportion of current period good news captured by current period accounting earnings X_t. Under conservative accounting, this coefficient is expected to be less than the cost of equity capital $(1-\theta_0)/k < 1/k$ in either regime. The incremental coefficient $(\gamma_0+\theta_0)/k$ captures the incremental proportion of current period bad economic news captured by current period accounting earnings. Under conservative accounting, the incremental coefficient is expected to be greater than zero (the total response to bad news is given by $(1-\gamma_0)/k$).

For estimation purposes, an exogenous indicator variable that distinguishes between the two regimes of permanent earnings in (4-24a) and (4-24b) is defined such that the dummy variable Λ_t =0 if $x_t>\lambda$ and Λ_t=1 if $x_t\leq\lambda$. Multiplying (4-24a) with $(1-\Lambda_t)$ and (4-24b) with Λ_t, summing the resulting equations, collecting terms and rearranging the following expansion of the contemporaneous Pope and Walker (1999) is obtained:

$$\begin{aligned}\frac{X_t}{p_{t-1}} &= \frac{1}{k}+\frac{1-\theta^+}{k}R_t+\frac{\gamma^+ +\theta^+}{k}D_tR_t+ \\ &+\left(-\frac{1-\theta^+}{k}+\frac{1-\theta^-}{k}\right)\Lambda_tR_t+\left(-\frac{\gamma^+ +\theta^+}{k}+\frac{\gamma^- +\theta^-}{k}\right)D_t\Lambda_tR_t+\frac{V_t}{p_{t-1}}\end{aligned} \tag{4-25}$$

where, in addition to the variables already defined, Λ_t represents the identification of the two permanent earnings regimes. To discuss the properties of the model in equation (4-25), it is useful to construct a hypothetical empirical form of (4-25) with the intention that this empirical form would have a similar role as Pope and Walker's (1999) theoretical model when they explain Basu's (1997) empirical equation. In particular, in their empirical models, both Basu (1997) and Pope and Walker (1999) include the term with the bad news indicator D_t in the regression equation (see equation (3-10) in section 3.3 – the second term on the right-hand side including the coefficient α_2), even though this term does not follow from theoretical derivations in the paper. A similar approach to show the properties of equation (4-25) is taken:[77]

$$\frac{X_t}{p_{t-1}} = \alpha_1 + \alpha_2 D_t + \alpha_3 \Lambda_t + \alpha_4 D_t \Lambda_t + \beta_1 R_t + \gamma_1 D_t R_t + \beta_2 \Lambda_t R_t + \gamma_2 D_t \Lambda_t R_t + \varepsilon_t \qquad (4\text{-}26)$$

While the discussion of a possible operationalisation of Λ_t is deferred until later in the section, some explanations of (4-26) can be provided. First, because (4-26) incorporates four different states of the world, the terms with coefficients α_3 and α_4 are introduced in addition to the α_2 coefficient that appears already in the original Pope and Walker (1999) model. These coefficients appear in equation (4-26) to avoid the correlated omitted variables problem and the resulting biases. However, the expected values of the terms α_2, α_3 and α_4 are all zero – the cost of capital together with any cumulative effects of past conservative accounting should be, on average, equal for all firms: those that exhibit positive or negative economic news and those that are in either regime designated by the Λ_t. In other words, given the cost of capital ($1/k$), the expectation is that all firms conform to the same accounting rules. Second, while the β_1 and γ_1 terms in (4-26) are equivalent to Pope and Walker's (1999) model and capture the effects of under (over) recognition of good (bad) news, there are now two additional incremental coefficients β_2 and γ_2 that would capture any possible incremental effects for the (second) regime defined by the $\Lambda_t = 1$ variable. Again, the expectation is that these terms should all be equal to zero, if the same conservatism regime applies for the loss and profit firms.

[77] For reasons described below, equation (4-26) represents only a hypothetical form and is not estimated in this form.

Therefore, for the regime defined by $\Lambda_t = 1$ and given the cost of capital ($1/k$), the proportion of good news not recognised in current-period reported earnings can be estimated as $\theta^- = 1 - k(\hat{\beta}_1 + \hat{\beta}_2)$. If there was no difference between the two Λ_t regimes regarding the incorporation of good economic news, then $\hat{\beta}_2 = 0$ and $\theta^- = \theta^+$. The parameter γ^- in equation (4-9) reflects the (over)incorporation of current-period bad news into current-period reported earnings X_t for a firm in the $\Lambda_t = 1$ regime where permanent earnings are below or equal to an arbitrary threshold level of permanent earnings $x_t \leq \lambda$. Given the cost of capital, the parameter's estimate equals $\gamma^- = k(\hat{\beta}_1 + \hat{\gamma}_1 + \hat{\beta}_2 + \hat{\gamma}_2) - 1$. If there was no difference between the two Λ_t regimes regarding the incorporation of bad economic news then $\hat{\gamma}_2 = 0$ and $\gamma^- = \gamma^+$.

However, a major drawback of the model in equation (4-25) and the entire discussion in this section is that Λ_t, just as the level of permanent earnings x_t, and, consequently, the threshold level λ_t are not observable to the researcher. Thus, the threshold level and the indicator must be operationalised – i.e., certain "sensible" reference points must be chosen if (4-25) is to be empirically tractable. An interesting case obtains when Λ_t is operationalised in the following manner: a new indicator variable L_t is introduced as an empirical equivalent of Λ_t, defined so that $L_t = 1$ if *reported* (rather than permanent) earnings $X_t \leq 0$ and $L_t = 0$ if reported earnings $X_t > 0$. However, in this case, the indicator variable L_t is not exogenous and thus the linear correlation between the dependent variable and the indicator variable based on this same variable must be broken (see below for a discussion). It is thus attempted to operationalise (4-26)) by employing an absolute-value transformation of (4-25):

$$\left|\frac{X_t}{P_{t-1}}\right| = \alpha_1 + \alpha_2 D_t + \alpha_3 L_t + \alpha_4 D_t L_t + \beta_1 RET_t + \gamma_1 D_t RET_t + \\ + \beta_2 L_t RET_t + \gamma_2 D_t L_t RET_t + \varepsilon_t \qquad (4\text{-}27)$$

The absolute-value empirical version in (4-27) has two important properties. First, it removes the linear correlation between the reported earnings X_t and the indicator variable L_t based on this same reported earnings figure. Therefore, the information on the origins of an observation is preserved (i.e., profit/loss observation). A similar effect can be achieved by other transformations, for example a quadratic transformation. Second, the transformation preserves the information on the degree of extremity of reported earnings. These two properties are important features of the model – for example, it is possible that an abandonment option is in the money when a firm reports negative earnings (Hayn, 1995; Jan and Ou, 1995) and in particular when these negative earnings are large.[78]

The interpretation of the four regimes in (4-27) differs slightly from the interpretation of (4-26) because of the absolute value transformation. While the interpretation of good and bad news coefficients for the $L_t = 0$ segment remains the same regardless of the absolute-value transformation, the signs of the coefficients of the $L_t = 1$ segment must be inverted. Geometrically, this arises because the absolute value transformation acts as a mirror over the horizontal axis in the $(RET_{t,\,t-1}, X_t/P_{t-1})$-space, thereby resetting the originally positive slope to a negative slope. Therefore, the average cost of capital together with any previous-periods conservative accounting effect is captured by the following estimated regression coefficients: a)

[78] Tthe concept of abandonment options is not discussed in this thesis, although it is acknowledge that different definitions may have implications for this work.

for the reported profit observations and good economic news (positive returns) $\hat{\alpha}_1$; b) for the reported profit observations and bad economic news (positive returns) $\hat{\alpha}_1 + \hat{\alpha}_2$; c) for the reported loss observations and good economic news $\hat{\alpha}_1 + \hat{\alpha}_2 + (-\hat{\alpha}_3)$; and for the reported loss observations and bad economic news $\hat{\alpha}_1 + \hat{\alpha}_2 + (-\hat{\alpha}_3) + (-\hat{\alpha}_4)$. Again, the expected values of estimated coefficients $\hat{\alpha}_2$ to $\hat{\alpha}_4$ are all zero.

The interpretations of news-related total coefficients are summarised below:

		Economic news	
		Good (RET_t>0)	Good (RET_t≤0)
Reported earnings	Positive (X_t>0, L_t=0)	$\hat{\beta}_1$	$\hat{\beta}_1+\hat{\gamma}_1$
	Negative (X_t≤0, L_t=1)	$\hat{\beta}_1+(-\hat{\beta}_2)$	$\hat{\beta}_1+\hat{\gamma}_1+(-\hat{\beta}_2)+(-\hat{\gamma}_2)$

Although the expected values of the $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients are $\hat{\beta}_2 > \hat{\gamma}_1 > 0$, there is no reason to expect any difference between the two L_t regimes in terms of accounting conservatism so that $E[\hat{\beta}_2] = 0$ and $E[\hat{\gamma}_2] = 0$. If, however, empirically there is some (empirical) reason to believe that these expectations are different so that $\hat{\beta}_2 \neq 0$ and/or $\hat{\gamma}_2 \neq 0$ then this may indicate systematic effects that are present only when a firm is in the L_t= 1 regime, i.e., when it is a loss observation.[79]

[79] The term "may indicate" is used because there are some econometric properties that might seriously affect the ability to make inferences using this model (some are presented in section 4.8.5). While this is acknowledged, it must also be noted that there are no solutions available in the existing literature to solve this problem.

4.8.4 Direct signed tests and estimates of the generalised losses model

This section presents empirical estimates of the model presented in the preceding section. Apart from the issues that arise from the discussion in that section, there are at least two empirical issues that must be considered when estimating the losses model in equation (4-27) above. The first issue is the method of estimation. In this thesis, the Fama-MacBeth (1973) approach is generally followed. This involves estimating 33 individual-year regressions. However, to estimate (4-27), it must be noted that there are only 3, 7, 5, 1 and 18 observations in the early sample years 1969-1973 respectively that have been hit by bad economic news ($RET_{t,t-1} \leq 0$) and have simultaneously reported negative contemporaneous earnings after extraordinary and exceptional items ($EARN_t \leq 0$). This effectively precludes the estimation of yearly regressions and the inclusion of these years' coefficients in the calculation of cross-sectional averages. Consequently, the results presented below in Table 4-18 are cross-sectional averages for the period 1974-2001 only (28 cross-sections).[80]

The second issue relates to the segments that define the four groups of firms. While the bad economic news indicator is treated as being exogenous to the model, given that managers presumably cannot influence the stock returns in an efficient market, the L_t indicator is subject to a number of possible influences (e.g., timing of asset sales (e.g., Bartov, 1993) and other earnings management techniques (e.g., Burgstahler and Dichev, 1997). The indicator might therefore "bundle" together

[80] The differences between the Fama-MacBeth (1973) and pooled method are shown in the sensitivity analyses section.

observations that have reported negative earnings after extraordinary and exceptional items for different reasons. If these factors would have opposite directions with respect to market values, then the resulting coefficients on losses might be attenuated. Moreover, the imprecise separation of two permanent earnings-levels regimes introduces the errors-in-variables problem.

With these caveats, Table 4-17 first presents the results of a precursor to the absolute-value extension of the contemporaneous Pope and Walker (1999) model of accounting conservatism that differentiates between the two $L_t = 0$ and $L_t = 1$ groups developed in the preceding section. The dependent variable in these two regressions is the $EARN_t$ variable, the same variable in the same time period that is used to define the indicator L_t. This is followed by further estimations of the contemporaneous model of accounting conservatism using $EARN_t$ as the dependent variable, but where for each cross-section the sample is partitioned and the definitions of L_t reformed by the sign of one of the following main components of earnings: operating cash flows *OCF* and accruals *ΔWCAP*, *SPEC* and total accruals *Accruals* (*tot.*), rather than the earnings itself.

A formal test of the statistical differences between each group of partitions is also provided. For each partition and each independent variable, 28 pairs of regression coefficients are generated (one for each partition within each year) under the same set of GAAP rules regardless of the sign of any variable these accounting rules produce. A similar approach to test statistics is used by Mramor and Valentincic (2003). They use a similar matched-pair approach to compare the efficiency in classification of failing versus non-failing firms in terms of short-term liquidity where the common factor defining the pairs is the industry firms belong to. The efficiency rates in classifications of failing and non-failing firms are calculated with three different methods of estimation and are then compared in pairs by industries. In the context of the present study, the pairs of estimated regression coefficients for each of the 28 years are treated as matched pairs and a formal *t*-test of the differences in cross-sectional means is provided. The two-tailed test hypothesis stated in alternative form is (Anderson, Sweeney and Williams, 1993):

H^A: The mean difference between the values of coefficients for the two partitions does not equal 0.

and the corresponding test statistics is:

$$t = \frac{\bar{d}}{\sigma_d / \sqrt{n}} \qquad (4\text{-}28)$$

where $\bar{d}$ is the mean difference between the values of the two coefficients within a pair: $\bar{d} = (1/28) \cdot \sum_{\tau=1974}^{2001} (\hat{\beta}^{\tau}_{1,L_t=1} - \hat{\beta}^{\tau}_{1,L_t=0})$ or $\bar{d} = (1/28) \cdot \sum_{\tau=1974}^{2001} (\hat{\gamma}^{\tau}_{1,L_t=1} - \hat{\gamma}^{\tau}_{1,L_t=0})$, σ_d is the standard deviation of the difference, and n is the number of observations (i.e., pairs) n= 28. The test statistic is *t*-distributed with n= 28−1= 27 degrees of freedom. The difference d between the two coefficients constituting a pair is always calculated so that the "positive" partition is subtracted from the negative partition.

Table 4-17: Response of earnings to good and bad news by sign of earnings, operating cash flows and accruals, 1974-2001

Partitioning variables:	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	Match-ed-pair *t*-stat.	$\hat{\gamma}_1$	Match-ed-pair *t*-stat.	*avg.* R^2
Partition by: $EARN_t$								
$EARN_t \leq 0$	114.1	**-0.136**	0.027	0.059		0.016		**0.056**
		-11.139	1.657	0.669	0.004	0.169	-0.259	5.009
$EARN_t > 0$	728.4	**0.110**	-0.003	**0.059**		**0.040**		**0.164**
		14.760	-1.153	9.898		4.433		11.876
Partition by: OCF_t								
$OCF_t \leq 0$	77.2	**0.056**	-0.007	0.022		**0.180**		**0.149**
		5.104	-0.511	1.304	**-2.391**	3.528	0.065	8.143
$OCF_t > 0$	765.4	**0.097**	0.003	**0.059**		**0.176**		**0.167**
		12.048	1.068	11.488		12.622		14.834
Partition by: $\Delta WCAP_t$								
$\Delta WCAP_t \leq 0$	303.4	**0.079**	-0.001	**0.059**		**0.227**		**0.191**
		10.988	-0.215	7.010	-0.025	10.957	**3.884**	12.484
$\Delta WCAP_t > 0$	539.1	**0.101**	0.002	**0.059**		**0.127**		**0.155**
		12.208	0.366	5.059		6.798		11.830
Partition by: $SPEC_t$								
$SPEC_t \leq 0$	461.0	**0.072**	0.002	**0.050**		**0.211**		**0.175**
		8.606	0.608	5.956	-0.468	12.772	**4.719**	13.089
$SPEC_t > 0$	381.5	**0.121**	-0.003	**0.054**		**0.116**		**0.160**
		14.496	-1.226	7.056		9.357		11.130
Partition by: *Accruals* (*tot.*)								
Accruals (*tot.*) ≤0	539.1	**0.080**	0.003	**0.055**		**0.209**		**0.172**
		11.293	0.877	8.101	-0.402	11.429	**4.234**	12.794
Accruals (*tot.*) >0	303.5	**0.117**	-0.001	**0.061**		**0.092**		**0.158**
		14.510	-0.290	3.679		4.020		9.071

Notes. Estimated models are: $EARN_t/P_{t-1} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \varepsilon_t$ and, for each of the variables *EARN*, *OCF*, *ΔWCAP*, *SPEC* and *Accruals* (*tot.*). separated separately for negative and positive values of these variables. These variables are deflated, per share: *EARN* is earnings after extraordinary and exceptional items, *OCF* is operating cash flow, *ΔWCAP* is working capital accruals, *SPEC* is special items, *Accruals* (*tot.*) are *Accruals* (*tot.*)= *ΔWCAP+DEP+SPEC* (*DEP* is depreciation and amortisation charge), returns $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{t,t-1} = \{1$ if $RET_{t,t-1} \leq 0$; 0 otherwise$\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1974-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 28−1= 27 d.f., the critical value of the *t*-statistic is $|t_C| > 2.0518$. Boldfaced matched-pair *t*-statistic indicates significant differences between cross-sectional averages of the corresponding coefficients and partitions. The critical value of the *t*-statistic is $|t_C| > 2.0518$.

Partitioning by the sign of contemporaneous earnings *EARN* reveals that firms do not differ in terms of incorporation of good economic news in contemporaneous earnings, i.e., there is no difference in the magnitude of the estimated $\hat{\beta}_1$ coefficient between profit and loss observations. While the $\hat{\beta}_1$ coefficient for loss observations is not statistically significant, the magnitude of the coefficient is the same as for profit observations. A possible explanation (or at least a contributing factor) of the non-significance of the $\hat{\beta}_1$ coefficient is that the average number of observations used to calculate these regressions is only 114.1 per year, much lower than for the profit observations (728.4 firms per year). The response of contemporaneous earnings to bad news reveals that both groups of observations exhibit an asymmetric response to bad news, but again the coefficient $\hat{\gamma}_1$ for the loss observations is not statistically different from zero, although of the expected sign and economically reasonable magnitude.[81] Again, the statistical insignificance may be due to the low number of observations used to estimate the 28 yearly regressions. Formal tests of the average difference between profit and loss observations for both the $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients reveal that the differences between the two groups are not statistically significant. Also, the R^2 is lower for the losses partition – losses cannot persist (e.g., shareholders can always liquidate the firm), are not a good indicator of expected future earnings and therefore the association between earnings and market values will be lower (Sin and Watts, 2000).

Table 4-17 also presents the results of estimating the contemporaneous Pope and Walker (1999) model using earnings after extraordinary and exceptional items *EARN* as the dependent variable, but estimated separately for the positive and negative contemporaneous values of some of the main earnings components: operating cash flows *OCF* and accruals *ΔWCAP*, *SPEC* and total *Accruals* (*tot.*). Partitioning by the sign of contemporaneous *OCF* reveals that, overall, both $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients are roughly of the expected magnitude and sign: there is a partial

[81] Especially so because of potential existence of the sample truncation bias, presented below in section 4.8.5.

delayed response of earnings to current-period good news for both positive and negative *OCF*-partitions and there is a strong asymmetric response to bad news for both groups of firms. Formal tests indicate that the response to good news is on average less pronounced for loss observations (*t*-statistic –2.391, statistically significant), but that the difference in terms of response to bad news between the two groups of firms is not statistically significant.

Partitions by the sign of all three accruals' variables reveal that there is a delayed response to good news and, generally, a high asymmetric response to bad news for all accruals' variables. Moreira (2002, p. 120) cites similar results for his US sample. Strikingly, the differences among estimated $\hat{\beta}_1$ coefficients across different partitioning variables and partitions are remarkably small and very similar in magnitude to the respective earnings and operating cash flow partitions. However, in all three cases the estimated bad news coefficients $\hat{\gamma}_1$ for the negative-accruals partitions are statistically significantly higher (almost double) than for the positive accruals partition.

These results emphasize the role of the accruals component in reflecting bad economic news. In all partitions that might be associated with reflecting bad news timely, the estimated $\hat{\gamma}_1$ coefficient is very high and statistically significant. The evidence presented is consistent with the notion that accounting conservatism is an accruals phenomenon and that it is independent of the sign of earnings and the operating cash flows and accruals components – all firms must obey the same GAAP rules. However, the asymmetric timeliness of earnings *EARN* is stronger for partitions where accruals are negative.

An alternative technique that explicitly accounts for any possible differences between loss and profit observations as well as helping to avoid the relatively low number of observations in some partitions, is to estimate the absolute value model on contemporaneous earnings after extraordinary and exceptional items $EARN_t$ developed in the preceding section. The results are presented in Table 4-18. In explaining this model, it must again be noted that all signs on the coefficients related to loss observations ($\hat{\alpha}_3, \hat{\alpha}_4$, $\hat{\beta}_2$ and $\hat{\gamma}_2$) must be inverted. For example, in the case of $\hat{\beta}_2$ and $\hat{\gamma}_2$ the minus sign indicates more, not less, asymmetry.

Table 4-18: Absolute-value extension of Pope and Walker (1999), 1974-2001

avg. n	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\alpha}_3$	$\hat{\alpha}_4$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_2$	$\hat{\gamma}_2$	R^2
					Profit obs.		Loss obs. (incr.)		
842.5	**0.110**	-0.003	0.025	-0.024	**0.059**	**0.040**	-0.118	-0.056	**0.150**
	15.021	-1.174	1.808	-1.561	10.074	4.512	-1.377	-0.597	12.992

Notes. Dependent variable is $EARN_t$. Estimated models are: $EARN_t/P_{t-1} = \alpha_1 + \alpha_2 D_{i,t-1} + \alpha_3 L_t + \alpha_4 L_t D_{i,t-1} + \beta_1 RET_{i,t-1} + \gamma_1 D_{i,t-1} RET_{i,t-1} + \beta_2 L_t RET_{i,t-1} + \gamma_2 L_t D_{i,t-1} RET_{i,t-1} + \varepsilon_t$ where $EARN$ is earnings after extraordinary and exceptional items, returns are $RET_{i,t-1} = (P_t - P_{t-1})/P_{t-1}$, $D_{i,t-1}$ = {1 if $RET_{i,t-1} \leq 0$; 0 otherwise}, L_t = {1 if $EARN_t \leq 0$; 0 otherwise}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1974-2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 28–1=27 d.f., the critical value of the t-statistic is $|t_C|>2.0518$.

Consistent with other evidence presented in other parts of this thesis, Table 4-18 reveals that there is a delayed response to good news for profit observations, the magnitude of the estimated coefficient $\hat{\beta}_1 = 0.059$ being close to magnitudes presented above in Table 4-17 as well as in the main results (see Table 4-8 above). The estimated coefficient on bad news ($\hat{\gamma}_1$) is positive and statistically significantly different from zero, consistent with asymmetric timeliness of earnings. Also, it is of a similar magnitude to the corresponding coefficient in Table 4-17. Incremental results for loss observations reveal that there is no statistically significant difference between profit and loss observations, at least not when using this model. There are some (slight) indications that loss observations tend to incorporate both good and bad news faster than profit observations, but they are all statistically insignificant. However, these inferences are possibly affected by several biases that result from the construction of the empirical version of the initial model in equation (4-27): the attenuation bias that arises as the result of imperfect measurement of the two permanent earnings-levels (presented in section 2.3.1), the effects of sample truncation bias (Hausman and Wise, 1977) that arises because of the truncation by the dependent variable (presented below) and, possibly, the correlated omitted variable problems because some possibly (empirically) important variables are excluded from the model, the book value of equity in particular (e.g., Collins, Pincus and Xie, 1999).

4.8.5 The effect of truncation by sign of earnings

Both previous attempts at distinguishing the incorporation of good and bad news separately for profit and loss firms are conceptually equivalent in that they require partitioning of the sample by the value (or the sign) of the contemporaneous dependent variable. This requires previous knowledge of the endogenous variable by the researcher. For example, estimating the loss partition of firms using the $L_t = 1$ indicator variable in Table 4-17 is equivalent, in practical terms, to eliminating all observations that have $EARN_t > 0$ from the sample. Equivalently, observations with $EARN_t > 0$ may be assumed not to be observable. This introduces the sample-truncation bias in the estimation process, first explained by Hausman and Wise (1977), presented in, for example, Baltagi (1998, pp. 351-353) and more recently discussed in the context of this research as a possible explanation of the limitations of Basu (1997) and Pope and Walker (1999) results by Muller and Riedl (2001).

Figure 4-1 is an illustration adapted from these sources. It shows a hypothetical estimated regression line resulting from a simple bivariate regression of generic accounting earnings $EARN_t$ on returns $RET_{t,t-1}$ for a full sample (i.e., a sample containing observations where $EARN_t \leq 0$ and $EARN_t > 0$) (dark blue line) of the following form:[82]

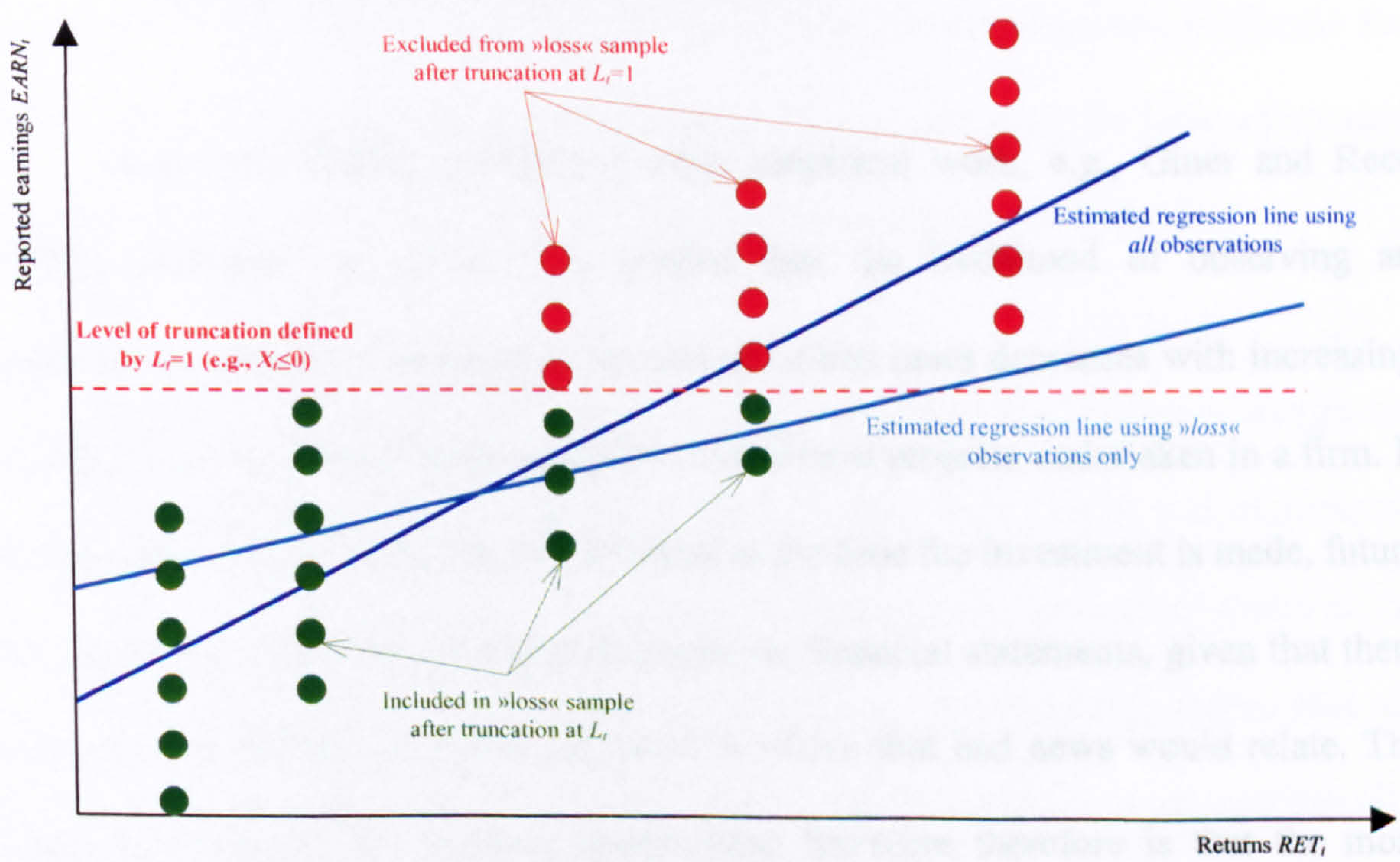
$$EARN_t = \alpha + \beta RET_{t,t-1} + \varepsilon_t \qquad (4\text{-}29)$$

where $\hat{\beta}$ is the estimated slope coefficient of a hypothetical regression line of a form such as the form described by equation (4-29). The figure also contains a hypothetical regression line (turquoise-coloured) resulting from the same model as in (4-29), but estimated from a sample containing only observations where $EARN_t \leq 0$ and thus $L_t = 1$. These points are shown in green colour. The slope of such a regression is less than the slope estimated from the full sample. In other words, estimating (4-29) for loss firms only *reduces* the magnitude of the relationship between earnings and returns.[83] This is precisely the problem that precludes a clear discrimination between two possible explanations of the results of the absolute-value model above in Table 4-17: a) that there are in reality no differences between profit

[82] For the purposes of this presentation, both *EARN* and *RET* are be assumed to be generic names, not necessarily defined as in this study.
[83] Note that the model in equation (4-29) is a restricted version of contemporaneous models of conservatism.

and loss observations in terms of accounting conservatism; and b) that there are differences between the two groups of firms, but that these cannot be inferred because of the sample truncation bias (among other problems). Moreover, the lower the truncation level of *EARN* that defines the L_t indicator, the more severe the sample truncation bias and the smaller the slope coefficient.[84] Generally, the sample truncation bias depends also on the nature of the relationship between *EARN* and *RET* (if only as a result of the way accounting conservatism is modelled in Basu, 1997, and Pope and Walker, 1999), the variance of the error term and values of the independent variable *RET* (Hausman and Wise, 1977).

Figure 4-6: Illustration of the sample truncation bias



Source: adapted from Hausman and Wise, 1977; Baltagi, 1998; Muller and Riedl, 2003.

Figure 4-1 might help to provide an alternative explanation as to why the bad news coefficient $\hat{\gamma}_1$ for the $EARN_t \leq 0$ partition in the preceding section is lower than

[84] The definition of the L_t dummy variable need not be exactly at $EARN_t = 0$ level, but could generally be defined for any level of *EARN*.

the $\hat{\gamma}_1$ coefficient for $EARN_t$>0 partition (see Table 4-17 in section 4.8.4.). However, it must be noted that the good news coefficients are of similar magnitudes in both cases, thus suggesting that the effects of sample truncation bias might not be significant. It is not possible to discriminate formally between these explanations in this study, but a possible solution constitutes an area of further research.

4.9 EFFECTS OF ASSET RECOGNITION RULES ON EX-POST CONSERVATISM

4.9.1 Book-to-market ratio as a proxy for pervasive conservatism

Pope and Walker (2003) and other empirical work, e.g., Giner and Rees (2001), presented in section 3.6, predict that the likelihood of observing an asymmetric relation of earnings to the arrival of bad news decreases with increasing levels of ex-ante conservatism applied to investment projects undertaken in a firm. If a firm writes off the entire amount invested at the time the investment is made, future bad economic news will not have an impact on financial statements, given that there is no asset recorded in the balance sheet to which that bad news would relate. The main prediction of the ex-ante conservatism literature therefore is that the more unrecognised assets a firm has, the less likely it is to observe asymmetric timeliness of earnings with respect to bad news. As in the case of news-driven conservatism, the arrival of bad news should be reflected relatively quickly in the accruals component of earnings.

To test for the effects of asset-recognition rules, the contemporaneous versions of ex-post conservatism models is estimated by tertiles of the opening value of the book-to-market ratio. The sub-division into tertiles is re-calculated at the beginning of every fiscal year from 1969 to 2001 to mimic as closely as possible the Pope and Walker (2003) method. However, this research is expected to be less "precise" in the sense that that they use deciles rather than tertiles of opening value of book-to-market ratio. Using deciles calculated within each of the 33 years is unfeasible using this particular UK sample as the number of firms within each decile within each year would be (is) too small to ensure appropriate estimations of regressions and inferences based on them. The dilemma was either to exclude some (a significant number of) years from the analysis or divide firms within each year into tertiles rather than deciles. Representativeness concerns lead me to choose the latter option. Thus, the predictions regarding the influence of the level of ex-ante conservatism by the main groups of accounting variables are the following:

- Of the earnings components, the operating cash flows (*OCF*) figure should not exhibit asymmetric timeliness with respect to bad news overall and asymmetric timeliness of *OCF* should not change with the amount of recognised assets on the balance sheet relative to "total" (i.e., including non-recorded) assets that are expected to generate future cash flows. *OCF* should be an accruals-free accounting figure and thus not subject to effects of conservative accounting practices.
- Earnings should exhibit asymmetric timeliness with respect to bad news overall; the asymmetry should be increasing from low book-to-market firms (i.e., ex-ante relatively conservative firms) to high book-to-market firms (i.e., ex-ante

relatively liberal or aggressive firms). Also, the asymmetry should increase from operating profit (*OP*) to earnings after extraordinary and exceptional items (*EARN*), given that the latter figure should always contain more accruals components that capture the reaction of earnings to bad news.

- The accruals component(s) of earnings should reflect the effects of the arrival of bad news on the capital market and make earnings more timely than cash flows in reflecting bad news. Of the different accruals components, the type of accrual most discussed or referred to in the literature are the special items (*SPEC*). Evidence regarding the ex-post conservatism presented mainly in section 4.5, but also in other sections in this research, indicates that an important role in the asymmetric timeliness of earnings should also be given to *ΔWCAP*. Therefore, it is predicted that the higher the amount of assets on the balance sheet as opposed to unrecognised assets, the higher the likelihood of observing an asymmetric reaction to bad news and the higher the coefficient on bad news. Likewise, following from the results obtained in this research and theoretical expectations, the depreciation and amortisation expense (*DEP*) should not exhibit asymmetric timeliness with respect to bad news.

The results are presented in Table 4-19. As in other parts of this research, the statistics presented are Fama-MacBeth (1973) cross-sectional averages and the total and relative total coefficients are calculated from the estimated $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients.

Table 4-19: Contemporaneous models of accounting conservatism by opening book-to-market tertiles, 1969-2001

Dependent variable	Opening B/M rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
	Smallest	237.6	**0.161**	0.006	**0.041**	**0.084**	**0.063**	0.125	3.072
			14.327	1.302	2.587	3.759	8.320		
OCF	Middle	237.3	**0.209**	0.007	0.198	-0.091	**0.065**	0.108	0.542
			8.170	0.342	1.461	-0.635	6.665		
	Highest	236.9	**0.293**	-0.001	**0.130**	-0.050	**0.061**	0.080	0.616
			12.986	-0.076	7.513	-0.884	8.651		
	Smallest	237.6	**0.167**	0.004	0.022	**0.157**	**0.190**	0.179	8.138
			10.110	0.800	0.476	3.358	13.063		
OP	Middle	237.3	**0.205**	0.008	**0.142**	0.111	**0.209**	0.254	1.782
			10.132	0.959	2.586	1.819	13.321		
	Highest	236.9	**0.251**	-0.006	**0.128**	**0.141**	**0.190**	0.269	2.099
			11.024	-0.645	9.746	4.219	13.607		
	Smallest	237.6	**0.085**	**0.005**	0.020	**0.110**	**0.223**	0.130	6.414
			13.502	2.480	1.097	5.880	13.394		
ORD	Middle	237.3	**0.101**	0.007	**0.077**	**0.136**	**0.268**	0.213	2.754
			13.839	1.678	2.953	4.056	15.405		
	Highest	236.9	**0.107**	0.000	**0.081**	**0.143**	**0.236**	0.225	2.759
			13.627	-0.045	10.432	7.306	15.608		
	Smallest	237.6	**0.083**	**0.009**	**0.037**	**0.129**	**0.202**	0.166	4.470
			13.945	3.057	5.612	10.372	13.422		
EARN	Middle	237.3	**0.100**	**0.012**	**0.079**	**0.202**	**0.237**	0.281	3.566
			13.170	2.252	2.738	5.019	14.378		
	Highest	236.9	**0.099**	0.005	**0.083**	**0.224**	**0.194**	0.307	3.697
			11.125	0.633	12.530	9.587	13.611		
	Smallest	237.6	**0.052**	-0.001	-0.026	0.081	**0.029**	0.054	-2.069
			4.653	-0.209	-0.544	1.562	6.769		
ΔWCAP	Middle	237.3	**0.061**	0.003	0.006	**0.110**	**0.039**	0.116	20.032
			4.563	0.423	0.235	2.821	7.260		
	Highest	236.9	**0.058**	-0.004	0.019	**0.156**	**0.034**	0.175	9.317
			5.187	-0.347	1.665	3.037	7.803		
	Smallest	237.6	**0.053**	0.006	0.004	0.068	**0.052**	0.072	18.364
			5.729	0.897	0.086	1.355	7.445		
- of which *ΔDebtors*	Middle	237.3	**0.070**	-0.005	-0.008	**0.133**	**0.043**	0.125	-15.806
			6.047	-0.574	-0.185	2.274	11.168		
	Highest	236.9	**0.065**	0.006	**0.029**	0.138	**0.034**	0.167	5.762
			5.398	0.408	2.457	1.726	6.038		
	Smallest	237.6	**0.048**	0.000	0.013	0.027	**0.039**	0.040	3.084
			5.168	-0.062	0.580	1.066	7.155		
- of which *ΔStock*	Middle	237.3	**0.063**	-0.006	0.001	0.048	**0.034**	0.050	42.673
			4.738	-0.928	0.050	1.242	7.045		
	Highest	236.9	**0.062**	0.008	**0.040**	**0.139**	**0.034**	0.179	4.490
			4.970	0.747	3.737	3.537	7.161		
	Smallest	237.6	**-0.048**	-0.007	**-0.043**	-0.014	**0.043**	-0.057	1.326
			-6.317	-1.575	-2.098	-0.556	7.055		
-of which *ΔCreditors*	Middle	237.3	**-0.072**	0.014	0.013	-0.071	**0.031**	-0.058	-4.664
			-5.881	1.584	0.296	-1.309	8.339		
	Highest	236.9	**-0.069**	-0.019	**-0.050**	-0.121	**0.033**	-0.171	3.419
			-5.606	-1.472	-3.582	-1.692	6.441		

Cont.

Dependent variable	Opening B/M rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
	Smallest	237.6	**-0.048**	0.000	0.007	-0.004	**0.014**	0.002	0.349
			-13.775	0.028	0.524	-0.315	6.619		
DEP	Middle	237.3	**-0.068**	-0.004	-0.064	0.084	**0.028**	0.021	-0.330
			-8.906	-0.580	-1.044	1.347	4.001		
	Highest	236.9	**-0.105**	-0.001	**-0.022**	**0.038**	**0.030**	0.016	-0.714
			-14.818	-0.327	-4.484	2.270	5.603		
	Smallest	237.6	-0.005	0.004	0.014	0.015	**0.034**	0.029	2.062
			-1.948	1.322	0.950	0.900	6.227		
SPEC	Middle	237.3	-0.004	**0.007**	-0.002	**0.070**	**0.038**	0.068	-27.956
			-1.749	3.337	-0.389	4.048	5.381		
	Highest	236.9	**-0.007**	0.004	-0.010	**0.080**	**0.042**	0.070	-6.748
			-2.155	0.947	-1.739	5.405	6.673		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1} RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{t,t-1} = \{1 \text{ if } RET_t \leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$. The value of the opening book-to-market is re-calculated every year and tertiles re-formed accordingly.

Starting from the *EARN* measure of earnings and the incremental bad news coefficient, the asymmetric timeliness of *EARN* to bad news is statistically significant in all three book-to-market tertiles and the asymmetry in response is increasing from the low to the high book-to market tertile as evidenced by increasing estimated $\hat{\gamma}_1$ coefficients across the tertiles. This is consistent with expectations; the likelihood of observing asymmetric timeliness of earnings should increase with the book-to-market ratio. Given the evidence presented in section 4.5.1, the asymmetric timeliness should be observed in all tertiles and generally for any firm at any time interval. The total response to bad news also increases across the tertiles. The sensitivity of *EARN* to good news is also increasing with the amount of assets recorded on the balance sheet – low book-to-market firms delay the recognition of good news in *EARN* by more than the high book-to-market firms (Pope and Walker, 2003). Interestingly, the R^2 is highest for the middle tertile. That the R^2 in the lower tertile is lower than the R^2 in the middle tertile is not surprising given previous results – the lower R^2 indicates that accounting numbers play a lesser role in valuation of the low book-to-market firms, assuming the R^2 as an indicator of association between accounting numbers and market values (e.g., Francis and Schipper, 1999). In addition, an on-average lower R^2 may also be a consequence of a higher content of transitory items at the extremity of the sample. While Pope and Walker (2003) do not provide in their tables R^2s that would be directly comparable, those reported from lagged versions by book-to-market deciles (Table 5) exhibit an inverted U-shape pattern, consistent with the results presented in this research. On the other hand, Giner and Rees (2001, Table 7) show that the R^2s are decreasing monotonically with the increasing book-to-market ratio.

The results for ordinary earnings (*ORD*) repeat the same pattern in terms of asymmetric timeliness, total response to bad news, response to good news and R^2s across tertiles. The results for operating profit (*OP*) are more mixed and there are no clear patterns to movements of these statistics across the tertiles. Asymmetric timeliness is only statistically significant in the two extreme tertiles and even ignoring statistical significance, there is no clear pattern of incremental response to bad news across the tertiles. Moreover, the asymmetry is highest in the lowest book-to-market tertiles. However, the total response to bad news increases across tertiles as would be expected.

The results for the *OP* figure resemble perhaps more the operating cash flow (*OCF*) results than the earnings results. This would not be, empirically, entirely inconceivable given that *OP* should contain the least accruals components of all three earnings measures used in this research. It is surprising and inconsistent with expectations that *OCF* exhibits a significant asymmetry in response to bad news (both in statistical and economic sense relative to other results presented) in the lowest book-to-market tertile. Another unexpected result is that the total response to bad news is decreasing across tertiles, although given the method used, the statistical significance of these total coefficients cannot be inferred. A possible factor in explaining these results is that the empirical estimate of *OCF* is not entirely accruals-free. Even so, however, the asymmetry would be expected at the other end of the tertiles-partitioning (high book-to-market).

Regarding the accruals components, special items *SPEC* are discussed first. Consistent with expectations and results presented for the earnings figures, *SPEC* exhibits increasing asymmetric timeliness to bad news across the three book-to-market tertiles, both in incremental and total terms. Moreover, the R^2s are increasing consistently across the tertiles. The three good news coefficients are generally not statistically significant, which suggests that good news is not passed through extraordinary and/or exceptional items but rather as a part of the "ordinary" components of earnings. This result is consistent with both the observations in the literature and the results from this research presented in earlier sections (in particular Figure 4-1). Also, in the highest book-to-market tertile, the estimated values of the $\hat{\beta}_1$ and $\hat{\gamma}_1$ coefficients are consistent with values observed for the basic set of results (compared with Table 4-8). In particular, the asymmetric timeliness is strong and statistically significant, and the response to good news indicates that good news results in an earnings-decreasing charge through these special items. This last inference is not statistically significant at the level usually employed in this research using the Fama-MacBeth (1973) method (α=5%) but would be significant assuming the exact level of significance α= 9.165% (at t= −1.739) would be considered acceptable. Very similar results, compared with the basic set of results in section 4.5.1, are also obtained when *ΔWCAP* acts as the dependent variable. The asymmetric timeliness of *ΔWCAP*, as well as the total response to bad news, increases as the book-to-market increases. Note that the net current asset is a component of the book-to-market ratio.[85] The results on individual components of *ΔWCAP* are generally not statistically significant. A clear exception is again the *ΔStock* component, which exhibits a strong asymmetric response to bad news. Ignoring the statistical significance, however, asymmetric timeliness with respect to bad news increases across tertiles for all three individual components studied, using either the incremental or the total coefficient on bad news.

To sum up, the results presented in this section are consistent with Pope and Walker's (2003) prediction that the asymmetry in response to bad news should increase with the amount of assets recorded on the balance sheet. As an extension to their findings, the evidence presented shows that the asymmetric timeliness is reflected and, more importantly, increases with the two main components of accruals, the working capital accruals (*ΔWCAP*) and special items (*SPEC*). Overall, the results are consistent with other results presented in this thesis.

[85] This represents one of the starting points for section 4.9.2, where asset-specific ex-ante recognition rules are considered.

4.9.2 Asset-specific measures of pervasive conservatism

Pope and Walker (2003) extend their model of ex-post accounting conservatism to allow for the differences in levels of ex-ante conservatism. As an extension of their work, the preceding section shows regressions on cash flow and accruals components of earnings as well as various earnings figures by tertiles of the book-to-market ratio. In this section, previous results are further extended. First, accounting earnings are again decomposed into its operating cash flows and accruals components. Next, given the results presented in section 4.9.1 above, the contemporaneous Pope and Walker (1999) models using each of the accruals components of earnings as dependent variables are re-estimated, but the regressions are conditioned on the values of deflated opening stock (balance-sheet) variable with which a particular earnings (or earnings component) figure likely relates. Given the extremely stringent data requirements to perform such an analysis and requirements conditional on the method of estimation (Fama and MacBeth, 1973), the conditioning stock variables are divided in tertiles within each individual fiscal year. It must be noted that Pope and Walker (2003) divide the observations in yearly deciles rather than tertiles, but their US sample is much larger and dividing into deciles would not be feasible in the case of the UK sample employed in this study.

The partitions and the corresponding predictions resulting from the extensions of the general analysis of the effects of asset-recognition rules are as follows:

- *ΔWCAP* originates from the net change in current assets and current liabilities (net current asset) from the balance sheet; the higher the opening stock of net current assets per share relative to the opening price per share, the more likely it is that a particular bad news will be reflected in working capital accruals during the period *t*. The asymmetric timeliness of *ΔWCAP* is expected to increase from the lowest tertile to the highest tertile of net current assets per share deflated by opening share price;
- *ΔDebtors* originates from the change in the amount of debtors' accounts a firm carries on the balance sheet; the higher the opening stock of net debtors per share relative to the opening price per share, the more likely it is that a particular bad news will be reflected in the debtors' accruals during the period *t*. The asymmetric timeliness of *ΔDebtors* is expected to increase from the lowest tertile to the highest tertile;
- *ΔStock* originates from the change in the amount of stock and work in progress a firm carries on the balance sheet; the higher the opening stock of stock and work in progress per share relative to the opening price per share, the more likely it is that a particular bad news will be reflected in the stock and work in progress accruals during the period *t*. The asymmetric timeliness of *ΔStock* is expected to increase from the lowest tertile to the highest tertile;
- *ΔCreditors* originates from the amount of creditors' accounts a firm carries on the balance sheet; the higher the opening stock of net creditors per share relative to the opening price per share, the more likely it is that a particular bad news will be reflected in the creditors' accruals during the period *t*. The asymmetric timeliness of *ΔCreditors* is expected to increase from the lowest tertile to the highest tertile;

- The depreciation and amortisation charge (*DEP*) normally originates from the stock of tangible and intangible fixed assets consumed within a period. In principle, the higher the opening stock of fixed tangible and intangible assets a firm carries on the balance sheet, the more likely it is that a particular bad news will be reflected in the depreciation charge. However, unlike in the previous examples of accruals, bad news and the corresponding adjustments of the carrying value of asset (that equal to the depreciation basis) is not expected to change asymmetrically.[86] Therefore, regardless of the amount of fixed and intangible assets per share relative to the opening price per share, bad news will not result in an asymmetric depreciation charge. However, given that some firms carry more assets (both tangible and intangible) on the balance sheet than others, the timeliness of *DEP* with respect to good news will increase.
- Special items (*SPEC*) capture in great majority the effect of extraordinary and/or exceptional items. At least some of these items should result from impairments of assets and related items. Given that it is difficult to pinpoint the exact source of this type of accruals, again the opening stock of fixed tangible and intangible assets relative to share price is used as the stock variable. It is to be expected that at least some of the effects of bad news will result in write-offs of fixed tangible and intangible assets that will then be captured by the *SPEC* variable. Therefore, the higher the opening amount of fixed and intangible assets per share relative to the opening price per share, the more likely it is that a particular bad news will result in some asset write-offs and a corresponding increase in the *SPEC* charge.

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[86] See also the expectations regarding the time-series behaviour of depreciation and amortisation charge (*DEP*) presented in section 3.2.

The results presented in Table 4-20 are generally consistent with these predictions. The asymmetric timeliness of *ΔWCAP* to bad news is highest in the tertile with the highest opening net current assets per share relative to the opening share price. This ratio represents an attempt to use only the portion of the book-to-market ratio that is relevant to this particular type of accruals. While the asymmetry reflected by the incremental coefficient $\hat{\gamma}_1$ between the first and second tertile decreases, the total response to bad news increases monotonically. Also, the magnitude of the response to bad news relative to good news increases monotonically with the relative amount of net assets on the balance sheet. The R^2 also increases with tertiles of net working capital. Finally, the response of *ΔWCAP* to good news increases with the relative amount of these items on the balance sheet.

Similar conclusions can also be drawn for the individual components of *ΔWCAP*. In the case of *ΔDebtors* and *ΔStock*, the results are qualitatively identical: the response to good news measured by $\hat{\beta}_1$, the incremental response to bad news measured by $\hat{\gamma}_1$, the total response to bad news, the R^2 and the total response to bad news all increase monotonically with increasing amounts of respective opening values of assets per share recorded in the balance sheet relative to the opening price. The results are weaker for the *ΔCreditors* variable. The asymmetric and total response is only significant for the highest tertile of the relevant balance-sheet item relative to the opening share price, but the R^2 is lowest for this tertile, contrary to expectations. In particular, the positive signs of the $\hat{\gamma}_1$ coefficient in the first two tertiles of *ΔCreditors* per share relative to opening price per share are interesting (indicating that the more negative the returns, the less creditors a firm has).

In the case of the depreciation and amortisation expense (*DEP*), the response to good news measured by $\hat{\beta}_1$, increase with increasing amount of fixed tangible and intangible assets per share on the balance sheet relative to the opening price, in line with expectations. Given that the definitions and/or classifications of fixed assets in the DataStream database differs somewhat across years, two other measures were employed in preliminary analyses as a measure of the conditioning opening "stock" variable: the opening stock of only fixed tangible rather than total fixed assets per share (DataStream item #339), deflated by the opening share price, and an "indirect" measure of total long-term assets per share, calculated as total opening assets (DataStream item #392) per share less total opening current assets (DataStream item #376) per share. The results and conclusions were quantitatively and qualitatively almost identical to those presented in Table 4-20 and are accordingly not presented.

The results for special charges (*SPEC*) are also generally in line with expectations regarding asset-specific rules of recognition: the asymmetric timeliness of *SPEC* to bad news, the R^2s and the total response to bad news all increase with the amount of fixed tangible and intangible assets on the balance sheet relative to opening market value, which, it is assumed, most likely "create" this accruals item. The results are also consistent with the expectation that a major part of the construct

Table 4-20: Contemporaneous models of accounting conservatism on accruals by tertiles of opening asset-specific "stock" items, 1969-2001

Dependent variable	"Stock" variable	Opening "stock" variable rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
		Smallest	236.1	**0.038**	-0.002	-0.020	**0.076**	**0.024**	0.056	-2.819
				4.968	-0.390	-0.951	**3.078**	**6.338**		
ΔWCAP	Net curr. assets	Middle	235.7	**0.057**	0.010	**0.025**	**0.067**	**0.032**	0.092	3.638
				5.821	1.324	**2.294**	**2.803**	**7.014**		
		Highest	235.4	**0.070**	-0.004	**0.036**	**0.136**	**0.037**	0.172	4.730
				4.816	-0.570	**2.787**	**3.516**	**7.248**		
		Smallest	236.2	**0.042**	-0.001	-0.023	0.061	**0.033**	0.038	-1.706
				4.801	-0.202	-0.536	1.447	**6.009**		
- of which *ΔDebtors*	Debtors & equiv.	Middle	235.8	**0.067**	0.005	**0.030**	**0.061**	**0.043**	0.091	3.054
				7.033	0.856	**4.388**	**3.078**	**9.160**		
		Highest	235.5	**0.072**	0.020	**0.069**	**0.177**	**0.053**	0.245	3.575
				5.299	1.032	**3.356**	**2.720**	**7.663**		
		Smallest	233.6	**0.033**	0.002	0.012	0.018	**0.027**	0.030	2.480
				4.237	0.412	1.327	1.117	**7.541**		
- of which *ΔStock*	Stock & WIP	Middle	233.2	**0.070**	-0.012	0.006	0.042	**0.035**	0.048	7.730
				4.510	-1.714	0.312	1.573	**7.325**		
		Highest	232.9	**0.080**	-0.001	0.026	**0.132**	**0.037**	0.157	6.134
				4.773	-0.068	0.980	**3.351**	**7.179**		
		Smallest	235.9	**-0.033**	**-0.009**	**-0.062**	0.014	**0.042**	-0.048	0.769
				-6.130	**-2.399**	**-2.411**	0.494	**6.020**		
- of which *ΔCreditors*	Creditors & equiv.	Middle	235.6	**-0.059**	-0.004	-0.089	0.034	**0.040**	-0.054	0.613
				-5.822	-0.603	-1.897	0.701	**8.760**		
		Highest	235.4	**-0.088**	-0.008	**-0.057**	**-0.100**	**0.036**	-0.157	2.754
				-6.604	-0.621	**-4.611**	**-2.232**	**8.420**		

Cont.

Dependent variable	"Stock" variable	Opening "stock" variable rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
DEP	Fix. assets & intang.	Smallest	236.5	**-0.039**	0.000	-0.007	0.005	**0.016**	-0.002	0.286
				-13.817	-0.264	-1.509	0.874	**5.630**		
		Middle	236.1	**-0.068**	-0.004	**-0.011**	0.004	**0.028**	-0.007	0.670
				-15.535	-1.737	**-3.394**	0.469	**5.559**		
		Highest	235.9	**-0.117**	-0.005	**-0.023**	0.023	**0.023**	0.000	0.005
				-15.400	-1.902	**-4.536**	1.564	**5.909**		
SPEC	Fix. assets & intang.	Smallest	236.5	0.000	-0.001	**-0.009**	**0.030**	**0.030**	0.021	-2.357
				0.164	-0.389	**-2.329**	**3.621**	**7.048**		
		Middle	236.1	**-0.006**	0.004	-0.002	**0.040**	**0.037**	0.038	-19.188
				-2.135	1.614	-0.516	**2.917**	**7.292**		
		Highest	235.9	**-0.009**	**0.008**	-0.011	**0.117**	**0.044**	0.106	-9.400
				-2.427	**2.600**	-2.022	**8.538**	**7.744**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{i,t-1}+\beta_1 RET_{i,t-1}+\gamma_1 D_{i,t-1}RET_{i,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_t = (P_t - P_{t-1})/P_{t-1}$ and $D_{i,t-1}$= {1 if $RET_{i,t-1} \leq 0$; 0 otherwise}. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f., i.e.,$|t|$>2.0369. The opening values of stock variables are re-calculated every year and tertiles re-formed accordingly.

SPEC is in fact formed from long-lived assets write-offs and/or adjustments in expected lives and/or residual values of these assets.[87]

To conclude, the asset-specific measures of pervasive conservatism reinforce the basic results obtained by dividing firm-year observations by the opening book-to-market ratio. The higher the opening stock of a particular asset relative to the share price, the more of the specific asset the firm carries on the balance sheet and the more likely it is that an asymmetric response to bad news will be observed. The results for all six dependent variables are consistent with these expectations for most of ex-post conservatism indicators. Moreover, the sensitivity to good news increases with the opening stock of these variables.

4.10 SUMMARY OF FINDINGS

This chapter presented the main empirical findings of the thesis. First, time-series properties of accounting figures that are consistent with predictions under conservative accounting. Operating cash flows are strongly mean-reverting and respond symmetrically to good and bad news. Earnings-decreases are strongly mean-reverting and earnings-increases are permanent, with the asymmetry more pronounced for earnings figures containing more accruals. Accruals on average mean-revert and the rate of reversal is higher for earnings-decreasing accruals, particularly for working capital accruals and special items. Changes in the

[87] The term "consistent with" must be particularly stressed at this point, given that direct supporting evidence of the statement cannot be shown due to lack of data.

depreciation charge are permanent. Overall, these results are consistent with predictions under conservative accounting.

Second, direct tests using Pope and Walker (1999) model present corroborating evidence – the more accruals an accounting figure contains (including certain types of accruals themselves), the more pronounced is its asymmetric timeliness in respect to incorporation of economic losses. Given that operating cash flows do not contain accruals, they respond to bad news symmetrically. The low observed R^2 in accruals regressions is consistent with accruals making cash flows more timely in incorporating economic news to form accounting earnings. Lagged models show clearly that good news is incorporated in earnings with a lag, while bad news is (mostly) incorporated within the time period it occurs. There are some slight, but persistent deviations from this general finding in terms of special items (and the earnings figure containing special items) in that some bad news is incorporated in these items over a number of periods, rather than immediately. Depreciation reflects news symmetrically. Conservatism also appears to be increasing over time, albeit evidence is not as strong as in comparable papers. In terms of controls for previous periods' conservatism, the results are robust.

Third, the investigation of loss versus profit observations reveal that differences between the two groups are important when the accruals and the operating cash flow components are considered. In particular, the earnings of the group of observations with negative accruals exhibit significantly more asymmetric timeliness than the group with positive accruals, consistent with conservatism being an accruals phenomenon. Separation by the sign of the cash flow component as well as earnings themselves does not produce differing results.

Fourth, the ex-ante application of conservatism principle limits the effects of ex-post conservatism on accounting figures that respond to conservatism (i.e., earnings figures and certain types of accruals). The more ex-ante conservative a firm is, the less likely it is to observe an asymmetric response of accounting measures to good and bad news. This is found to hold both generally and on an asset-specific basis.

The chapter also highlights a number of issues related to the research methods. In particular, variable construction and sample formation procedure are influenced by the length of time period covered in this study. This is important both in terms of empirical definitions of variables as well as issues regarding survivorship. The chapter also shows that distributional properties and correlations are important indicators of the effects of conservative accounting.

Overall, the results are consistent with the hypotheses formulated in section 3.9. While the results appear robust, certain firm attributes and methods of estimation and controls might have an impact on the results presented. Therefore, it is necessary to execute additional sensitivity analyses to provide additional support for the findings presented in this chapter. These analyses are the subject of the next chapter.

5 SENSITIVITY ANALYSES

5.1 INTORDUCTION TO SENSITIVITY ANALYSES

The contemporaneous and lagged samples employed in the main analyses in Chapter 4 consist of firms with different attributes. Firms differ in terms of size, industry membership, choice of accounting year-end, differing year ends both across different firms, changing year ends for some firms and varying lengths of accounting period. While the conservatism principle should apply equally across all firms regardless of their differing attributes, it is possible that these attributes induce systematic differences among certain groups of firms. For example, the nature of the link between accounting figures and market values might differ between smaller firms and large firms. Similarly, firms in a particular industry differ in terms of the underlying economics of the firms from firms in a different industry. These differences might be, in part, reflected in the choice firms make regarding their accounting year-end. In the analyses in Chapter 4 these differences are implicitly assumed not to have an important impact on particular ways the conservatism principle is reflected in accounting figures used in these analyses. Therefore, the first purpose of the sensitivity analyses is to explore if there are any indications that the application of conservative accounting might differ across firms with differing attributes.

The second purpose of the sensitivity analyses is to control for issues surrounding the estimation methods used in the main analyses in Chapter 4. First, the sample covers periods of differing economic environment. For example, the inflation rate varied from as high as almost 27% (monthly data, annualised) in 1975 to as low as 0.7% in 2001. These differing conditions might affect the relations between accounting and market values. Second, the both the method of estimation of the models of conservatism and the sample selection procedures bear upon the results presented in Chapter 4. Third, because the sample extends over a relatively long time period in which accounting regulation has been changing, the choice of particular accounting figures published under differing accounting regimes might affect the results.

The subsequent sections present additional analyses that show the effect of differing attributes across firms on the main results as well as specific methods of estimation. The attributes explored are: the effect of firm size, possible industry differences and systematic differences between December and non-December year-end firms. In terms of methods used and sample selection procedures, the effects of alternative measures of ex-ante conservatism, alternative outliers removal procedures, alternative methods of estimating regression models and issues regarding constructed versus published figures are shown.

5.2 *FIRM SIZE AND CONSERVATISM*

Several studies in the capital market-based accounting research study the influence of size on the relation between earnings and returns. For example, Collins, Kothari and Rayburn (1987) hypothesize and find that price-based forecasts of future earnings outperform univariate time-series forecasts by a greater margin for larger than for smaller firms. Firm size acts as a proxy for the amount of information about a firm and the number of analysts and traders that process that information. Specifically, they find that the R^2s in the relations between forecasted percentage changes in earnings per share and current period cumulative abnormal returns at the portfolio level increases (from 0.18 to 0.41), while the earnings response coefficient decreases with size. Consistent with this, Shores and Shevlin (1993) find that if unexpected earnings are positivethen the response to unexpected quarterly earnings is smaller for larger than for smaller firms (note that the unexpected earnings and cumulative abnormal returns are equally singed). On the other hand, if the unexpected earnings is negative the response to unexpected earnings is larger for larger firms than for smaller firms. Freeman's (1987) earlier study shows that the magnitude of reaction to good and bad news decreases with size and that prices lead earnings of large firms by more than for small firms. A related UK study is Charitou, Clubb and Andreou (2001).

In relating these findings to the accounting conservatism literature, at least three hypotheses may be formulated. First, given that the same accounting rules apply to all firms, small, medium or large, the coefficients in contemporaneous Pope and Walker (1999) models using any earnings or earnings component figure as the dependent variable, should be very similar in magnitude, sign and statistical significance within each variable regardless of firm size. However, based on Collins, Kothari and Rayburn (1987), Freeman (1987), Shores and Shevlin (1993) as well as Donnelly and Walker (1995), it is possible that the estimated regression coefficients on good news will decrease with size, while the incremental coefficient on bad news will increase with size. Second, if the amount of information and the number of analysts and traders are important factors that significantly affect the relation between accounting numbers and market values, the R^2s should increase with firm size. Firm size in this case proxies for the number of analysts following the firm and/or for the liquidity of the share, i.e., the information environment of the firm. Presumably, for larger firms more information is available, the lesser is the uncertainty surrounding the present value of future cash flows leading to higher R^2s than for smaller firms. Third, based on Freeman (1987), larger firms' share prices should lead accounting figures by more. Thus, longer lags might be significant, although opposite expectations might be formed. For example, smaller firms are more likely to write-off assets (see a summary of the relevant parts of Basu, 2001, below).

The size of the sample used in this study and the relatively large number of different accounting models influences the choice of (perhaps only) three size groups, consistent with similar analyses in the main chapter of the thesis. Size ranks and tertiles are re-formed at the beginning of each accounting period ending in sample years 1969-2001 by the opening value of market capitalisation. For each year and each size tertile, the contemporaneous Pope and Walker (1999) cross-sectional models are estimated, the results averaged, appropriate Fama-MacBeth (1973) *t*-statistics calculated and all inferences are made on this basis. The results are presented in Table 5-1. They are thus directly comparable to the basic set of contemporaneous results presented in Table 4-8.

Overall, the results show that the coefficients of both good news and bad news do not change monotonically across the three size tertiles and across all the accounting variables studied. Similarly, the R^2s across size tertiles do not change monotonically and in some cases and certain measures appear to follow an (inverse) U-shaped pattern across tertiles. A possible explanation consistent with this observation is that accounting figures at either end of size distributions contain more transitory items than firms in the middle of size distributions (e.g., Freeman and Tse, 1992; Das and Lev, 1994). This would cause the observed results regarding the R^2s without necessarily affecting the regression coefficients (albeit issues regarding persistence might be important).

Some of the other more interesting findings are the following. The sensitivity of all three measures of earnings *OP*, *ORD* and *EARN* to good news measured by the estimated regression coefficient $\hat{\beta}_1$ decreases with size tertiles, as expected. However, the asymmetric timeliness of the three earnings measures, measured by the incremental regression coefficient $\hat{\gamma}_1$, is also highest for the smallest tertile and lowest for the largest size tertile. Also, the total sensitivity of these earnings measures to bad news is higher for smaller firms than for large firms. While contrary to expectations based on Shores and Shevlin (1993), these last results are broadly in line with those reported by Basu, Hwang and Jan (2000).

A consistent pattern can be found in working capital accruals *ΔWCAP*, though not unequivocally in its individual components. In the case of *ΔWCAP*, the response to good news, the incremental response to bad news and the total response to bad news decrease monotonically with size. Thus, the smaller the firm, the larger the response of *ΔWCAP* to both good and bad news. The R^2s exhibit an opposite pattern (an inverted U-shape) to earnings' regressions. The results on special items

(*SPEC*) are less clear. While the response to good news is not statistically significant, the lowest and the highest tertiles exhibit a high and statistically significant asymmetric timeliness to bad news, and the R^2s increase across the tertiles. Other results show that operating cash flows (*OCF*) in the smallest and largest tertile are strongly related to good news (more for the smaller firms), while the middle tertile exhibits a strong and statistically significant asymmetric timeliness with respect to bad news, a result not expected under conservative accounting.

The equivalent results of lagged models are presented in Appendix H. Overall, the results are weaker, a possible consequence of the relatively small average number of observations, in particular in the smallest-firms tertile. Two results are perhaps worth stressing. First, in the *ORD* regressions, the asymmetric timeliness to current and lag-one bad news is highest for the smallest firms and smallest for the largest firms, consistent with Basu (2001). Moreover, the lag-two coefficient on bad news $\hat{\gamma}_3$ is significant, consistent with Freeman (1987). Also, there is some indication that large firms recognise bad news in special items (*SPEC*) more smoothly over more time periods than small firms.

Another way to study the influence of size would be by excluding the smallest 25% of observations by opening market value and, additionally, those observations where RET_t equals exactly zero. The results from these direct tests are quantitatively affected very little compared to the results in Table 4-8 and are thus not reported. Generally, however, the asymmetric timeliness of all three earnings measures decreases slightly; most of the asymmetry is still captured by $\Delta WCAP$ and *SPEC*.

To sum up, while size does appear to be a factor that introduces some incremental effects in the relation between market values and accounting figures under conservative accounting, the direction and magnitude are somewhat ambiguous.[88] Basu (2001) provides some explanations that might help explain the results observed in this research. First, smaller firms tend to be riskier. Holding future expected cash flows constant, this should lead to smaller market values – i.e., size is a proxy for (or a consequence of) risk (Rubinstein, 2001). Broadly in line with this observation, the variability of returns (*RET*), measured by σ_{RET}, increases from the smallest to the largest firms: 0.485, 0.481 and 0.425 respectively, albeit these decreases appear to be very small.[89] Smaller firms are thus (very slightly) more likely to be affected by bad news, required to write down assets more often, which would expose the firm to legal-liability risk (Basu, 2001).

Second, small firms might be less diversified, which makes write-downs more likely for these firms. Broadly consistent with this observation, the mean (average) values of deflated special items (*SPEC*) increase from –0.073 (–0.041) for the lowest tertile, to –0.001 (0.000) for the middle size-tertile and, switching sign, to +0.041 (+0.021) for the largest firms.

[88] There are studies that present arguments against the "size effect" in stock returns (e.g., Wang, 2000).

[89] Caution must be exercised, however, that these descriptives are calculated on a pooled, end-of-period basis instead of year-by-year, opening values used to form tertiles by size and are therefore not the exact equivalent of size classifications.

Table 5-1: Contemporaneous models of ex-post accounting conservatism by size tertiles (opening market capitalisation), 1969-2001

Dependent variable	Open. mkt. cap. rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
OCF	Smallest	258.9	**0.267**	-0.006	**0.104**	0.076	**0.063**	0.166	1.605
			14.893	-0.458	**6.704**	1.402	**8.330**		
	Middle	258.4	**0.228**	-0.005	0.034	**0.125**	**0.067**	0.101	3.001
			14.339	-0.514	0.584	**2.092**	**8.750**		
	Largest	258.2	**0.203**	-0.005	**0.051**	0.018	**0.064**	0.115	2.249
			16.318	-0.943	**2.804**	0.590	**4.664**		
OP	Smallest	258.9	**0.235**	-0.010	**0.115**	**0.167**	**0.183**	0.299	2.592
			10.997	-1.051	**8.096**	**4.038**	**14.020**		
	Middle	258.4	**0.218**	-0.008	0.061	**0.184**	**0.202**	0.264	4.311
			10.136	-0.785	1.863	**5.205**	**12.790**		
	Largest	258.2	**0.189**	-0.005	**0.059**	**0.082**	**0.133**	0.192	3.243
			12.407	-1.276	**4.285**	**4.613**	**7.330**		
ORD	Smallest	258.9	**0.107**	-0.005	**0.069**	**0.132**	**0.199**	0.268	3.880
			12.683	-0.812	**10.116**	**4.980**	**15.563**		
	Middle	258.4	**0.102**	0.000	**0.050**	**0.124**	**0.269**	0.319	6.326
			13.889	0.027	**5.701**	**8.696**	**14.118**		
	Largest	258.2	**0.094**	-0.001	**0.034**	**0.085**	**0.190**	0.224	6.663
			17.693	-0.393	**4.990**	**9.426**	**9.892**		
EARN	Smallest	258.9	**0.102**	-0.004	**0.070**	**0.178**	**0.169**	0.238	3.417
			11.081	-0.534	**9.464**	**5.714**	**14.847**		
	Middle	258.4	**0.097**	0.007	**0.062**	**0.170**	**0.217**	0.279	4.486
			13.375	1.534	**7.236**	**8.539**	**14.202**		
	Largest	258.2	**0.091**	0.002	**0.035**	**0.144**	**0.169**	0.204	5.797
			15.912	0.555	**4.788**	**7.919**	**11.277**		

Cont.

Dependent variable	Opening mkt. cap. rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
ΔWCAP	Smallest	258.9	**0.064**	-0.006	**0.021**	**0.093**	**0.030**	0.052	2.432
			5.788	-0.625	**2.324**	**2.671**	**7.993**		
	Middle	258.4	**0.061**	-0.006	0.027	**0.073**	**0.028**	0.055	2.028
			4.847	-0.831	1.727	**2.512**	**8.288**		
	Largest	258.2	**0.045**	-0.001	0.015	0.041	**0.030**	0.045	3.015
			5.572	-0.208	1.175	1.793	**6.437**		
- of which *ΔDebtors*	Smallest	258.9	**0.083**	-0.015	**0.033**	0.006	**0.031**	0.064	1.963
			8.570	-1.377	**3.315**	0.067	**7.099**		
	Middle	258.4	**0.067**	-0.006	0.007	**0.117**	**0.050**	0.057	8.696
			6.010	-0.741	0.216	**2.536**	**8.819**		
	Largest	258.2	**0.047**	0.006	**0.030**	0.019	**0.030**	0.060	2.008
			6.000	1.259	**2.470**	0.931	**7.777**		
- of which *ΔStock*	Smallest	258.9	**0.062**	-0.005	**0.025**	**0.079**	**0.032**	0.057	2.258
			5.099	-0.582	**2.285**	**2.195**	**7.934**		
	Middle	258.4	**0.059**	-0.001	0.066	0.011	**0.033**	0.099	1.503
			5.233	-0.209	1.645	0.258	**6.762**		
	Largest	258.2	**0.051**	-0.003	0.016	0.032	**0.026**	0.041	2.659
			5.243	-0.621	1.401	1.954	**6.578**		
-of which *ΔCreditors*	Smallest	258.9	**-0.081**	0.014	**-0.037**	0.007	**0.027**	-0.010	0.261
			-7.466	1.351	**-3.263**	0.080	**7.504**		
	Middle	258.4	**-0.065**	0.001	**-0.046**	-0.056	**0.048**	0.002	-0.050
			-6.657	0.184	**-3.169**	-1.523	**8.688**		
	Largest	258.2	**-0.054**	-0.004	**-0.030**	-0.010	**0.028**	-0.002	0.067
			-5.646	-0.615	**-2.789**	-0.424	**6.927**		

Cont.

Dependent variable	Opening mkt. cap. rank	avg. n	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
DEP	Smallest	258.9	**-0.097**	0.002	**-0.011**	-0.002	**0.028**	0.017	-1.476
			-20.628	0.465	**-2.107**	-0.121	**7.609**		
	Middle	258.4	**-0.073**	0.001	-0.002	-0.011	**0.027**	0.025	-10.304
			-15.603	0.361	-0.193	-0.663	**6.770**		
	Largest	258.2	**-0.064**	0.001	-0.006	0.014	**0.026**	0.020	-3.069
			-15.692	0.408	-1.083	1.500	**4.197**		
SPEC	Smallest	258.9	**-0.006**	0.000	-0.011	**0.054**	**0.029**	0.018	-1.583
			-2.386	0.096	-1.883	**4.372**	**6.127**		
	Middle	258.4	**-0.010**	**0.009**	0.016	0.034	**0.034**	0.050	3.164
			-2.972	**2.878**	1.104	1.915	**6.412**		
	Largest	258.2	-0.001	0.003	-0.002	**0.059**	**0.037**	0.035	-20.684
			-0.265	1.331	-0.509	**4.605**	**5.659**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{i,t-1}+\beta_1 RET_{i,t-1}+\gamma_1 D_{i,t-1}RET_{i,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{i,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{i,t-1}=\{1 \text{ if } RET_{i,t-1}\leq 0;\ 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f., i.e., $|t|>2.0369$. The opening market capitalisation is re-calculated every year and size tertiles re-formed each year accordingly.

A third and related possible explanation might be the coexistence of "big bath" accounting (e.g., Elliott and Hanna; Elliott and Shaw, 1988; Waymire, 1988) and earnings smoothing. A very rough adaptation/simplification of Kirschenheiter and Melumad's (2002) theoretical predictions might be the following. The more good the news is, the higher the degree of under-reporting in financial statements. For moderately bad news, they make no clear predictions (managers might either slightly over-report or slightly under-report). On the other hand, if news is very bad, managers will choose "big bath" accounting, while for moderately bad news, they will likely attempt to smooth earnings (likely adopt earnings-increasing accounting policies). Note at this point that size, measured as market capitalisation, directly affects these statements through the definition of news used in this study. In a very condensated approach to this analysis, it is first assumed all such earnings-influencing activities are passed through *SPEC*. While this is likely for "big bath" procedures, managerial implementations of other activities are less clear. Second, observations are separated into four partitions according to the magnitude and sign of returns $RET_{t,\,t\text{-}1}$: a) $RET_{t,\,t\text{-}1} \leq -0.245$ (worst news, the number being the median return of all bad news firms); b) $-0.245 < RET_{t,t\text{-}1} \leq 0$ (moderate bad news); c) $0 > RET_{t,\,t\text{-}1} \geq 0.423$ (moderate good news) and d) $RET_{t,\,t\text{-}1} > 0.423$ (very good news, the number being the median return of all good news firms). Third, for each of these partitions a simple, bivariate, pooled regression of $SPEC_t$ on $RET_{t,t\text{-}1}$ is run:

$$SPEC_{it} = \alpha_1 + \beta_1 RET_{it,t-1} + e_{it} \qquad (5\text{-}1)$$

While this partitioning as well as the method of estimation are certainly very rudimentary, the expectations are that for bad news, the estimated regression coefficient $\hat{\beta}_1$ will be very high and positive for the worst bad news, causing thus for a given unit of bad news the highest decrease of earnings via making *SPEC* most negative. For moderately bad news, the estimated regression coefficient will be positive, but smaller than in the case of worst-news group. Under conservative accounting, firms are required to recognise bad news in current financial statements, but under Kirschenheiter and Melumad's (2002) they are less likely to choose "big bath" accounting methods. Part of bad news is thus still expected to be recognised through *SPEC* and consequently decrease earnings. On the other hand, for moderately good news and given that there are no clear theoretical predictions, the estimated $\hat{\beta}_1$ coefficient will likely be statistically insignificantly different from zero if the two effects are mixing, on average. The degree of under-reporting should be highest for the very good-news group. To obtain under-reporting, such policies must be chosen so as to reduce slightly the earnings that would otherwise be reported. In the simple context presented here, a unit of very good news should cause, in part, the creation of negative *SPEC*. The estimated $\hat{\beta}_1$ coefficient for this partition is thus expected to be negative (and likely not very large in magnitude).

The results are remarkably supportive of all four expectations. In the worst bad news-group the estimated regression coefficient is $\hat{\beta}_1 = 0.055$ (pooled *t*-statistics $t = 6.03$), for the moderately bad news-group $\hat{\beta}_1 = 0.030$ ($t = 2.49$), for the moderately good news $\hat{\beta}_1 = -0.008$ ($t = -1.25$) and for the very good news-group $\hat{\beta}_1 = -0.010$ ($t = -3.73$). Also note that the R^2, albeit comparable in magnitude to the main results of this research – i.e., relatively small (also see explanation in section 4.5.2), the R^2 is highest in the worst bad news-group, as would be expected (pooled $R^2 = 0.007$, pooled $F_{1,\ 6,449}$= 6.220). There also should not be any difference in terms of R^2 between the two bad news groups, yet in the moderate bad news it is several times lower (albeit still significant). These results are also consistent with the main results (see Table 4-8) regarding the *SPEC* regressions, where it has been shown that good news result in a slight earnings-decreasing change in special items (*SPEC*). These results are taken as indicative only. To provide a full explanation of these relations, more advanced methods would have to be used as well as a study of possible biases included.

Overall, therefore, while there are some indications of systematic differences in application of the conservatism principle across size tertiles, there are no clear-cut results for the overall sample. At least some of the observed differences might relate more to transitory components of accounting numbers as evidenced by an inverted U-shaped pattern in R^2s across the tree size tertiles for eight out of ten accounting variables studied than to any systematic differences resulting from different applications of accounting conservatism, on average. Given that all firms must conform to the same set of accounting rules this is to be expected.

5.3 *INDUSTRY DIFFERENCES*

The contemporaneous sample used in this study includes 85 different industries defined by DataStream industry codes (DataStream item *INDM*) (excluding financial services and similar industries), with the number of observations within each industry in the pooled sample ranging from a high of 2,106 for

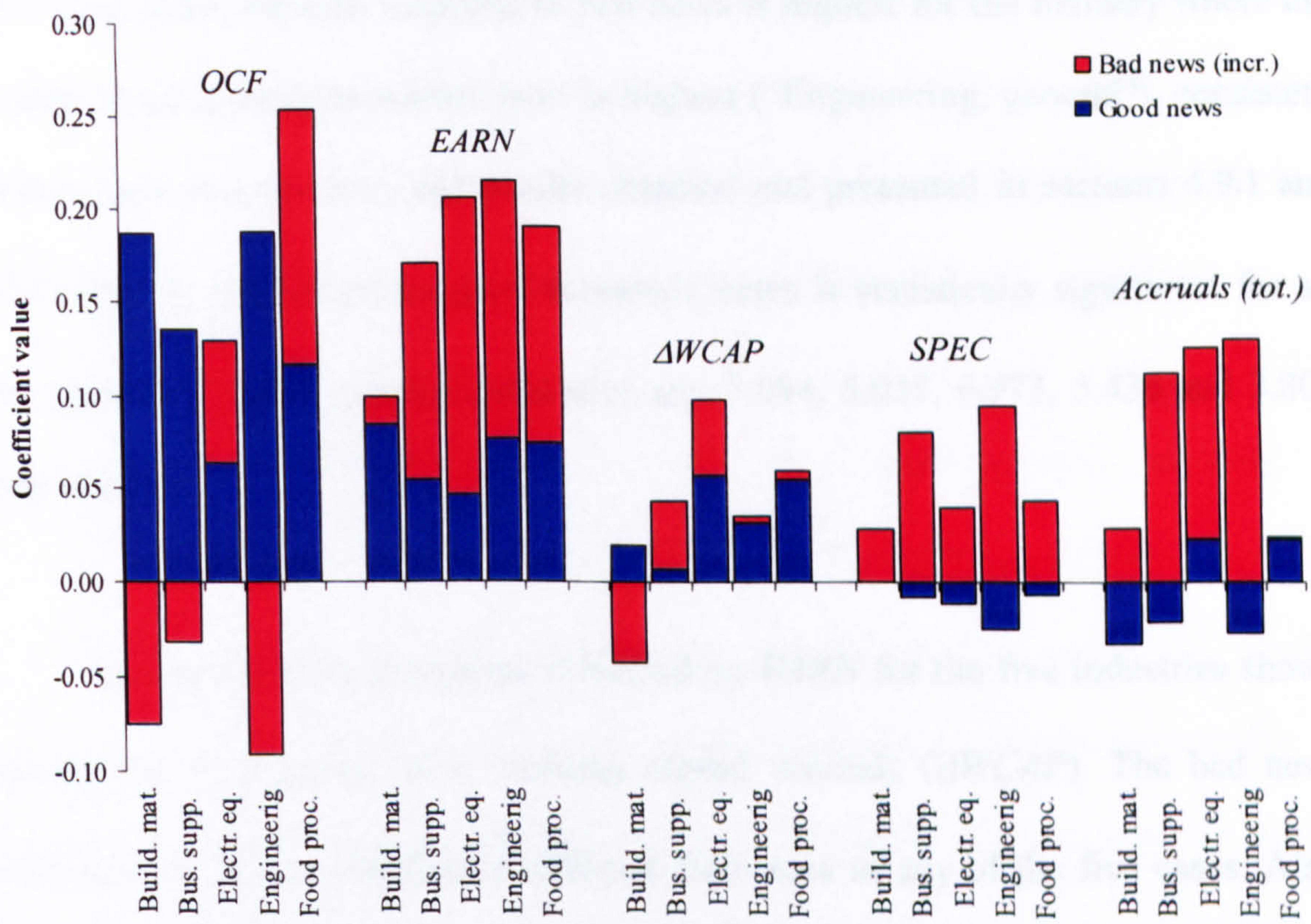
"Engineering, general" to as low as 9 ("Cable+Satellite" and "Retailers e-commerce") and 7 ("Gold mining"). The number of observations in some industries precludes the use of Fama-MacBeth (1973) regressions within industries and would likely make pooled estimates unreliable for some of these industries. One alternative to solve both these problems would be to aggregate "similar" industries together, as for example in Barth, Cram and Nelson (2001) for US firms to obtain 13 aggregate industries. However, attempts to mimic their aggregations for the UK market produce groups that again, as in their study, differ greatly in number of observations and differing results that may be due to imprecise aggregation.[90] Even so, aggregation may in some case be infeasible, as certain member industries would still be treated separately. An (early) example is the oil and gas industry, characterised as early as 1958 by Brock (1958) to be "ultra-conservative". An alternative approach is taken here accordingly.

Absent any other objective criteria on selection of industries, five DataStream *INDM* industries have been selected that contain at least 1,000 observations in the entire pooled 1969-2001 period. These industries are (number of observations and median opening book-to-market ratio in parentheses): "Building materials" (1,005; 0.954), "Business support" (1,485; 0.685), "Electrical equipment" (1,210; 0.637), "Engineering, general" (2,106; 1.181) and "Food processing" (1,011; 1.032). Other industries contain less than 1,000 observations in total. For these five industries, pooled contemporaneous-model regressions have been estimated for the entire 1969-2001 period. Results are presented graphically in Figure 5-1 for the main earnings

[90] In Barth, Cram and Nelson's (2001, notes to Table 6) study, the minimum number of observations is 47 (agriculture) for a sample spanning the years 1987-1996. The maximum number in their industry-specific sub-sample is 1,365 (retail).

figure and the main components for parsimony. In the figure, the estimated pooled good news coefficient $\hat{\beta}_1$ (blue) and the estimated incremental bad news coefficient ($\hat{\gamma}_1$) are shown and the sum of the two coefficients yields the total response to bad news.

Figure 5-1: Pooled contemporaneous models of conservatism by industry on main accounting variables for the largest five industries by number of observations, 1969-2001



Notes to Figure 5-1. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *SPEC* is special items and *Accruals* (*tot.*)= *ΔWCAP* + *DEP* + *SPEC*. $RET_{t,t-1}= (P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}= \{1 \text{ if } RET_{t,t-1}\leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. All coefficients' estimates are pooled cross-sectional time series for the period 1969-2001. Industries (as of DataStream item *INDM*) are: Building materials, Business support, Electronic equipment, Engineering, general, and Food processors.

The results show that for all five industries, operating cash flows (*OCF*) reflect a portion of current-period good economic news. The $\hat{\beta}_1$ coefficient is statistically significant for all five industries (pooled *t*-statistics are: 8.709, 7.443, 3.604, 9.586 and 4.738 respectively). There is no asymmetric timeliness of *OCF* with respect to bad news, except for the industry "Food processing" where the $\hat{\gamma}_1$

coefficient is (just) statistically significantly different from zero (pooled t-statistic: 2.049).

Earnings after extraordinary and exceptional items (*EARN*) exhibit clear asymmetric timeliness with respect to bad economic news, except for the industry "Building materials" where the pooled t-statistic on $\hat{\gamma}_1$ is not statistically different from zero. Also, the total response to bad news is highest for the industry where the median opening book-to-market ratio is highest ("Engineering, general"), consistent with ex-ante conservatism and results obtained and presented in sections 4.9.1 and 4.9.2. The $\hat{\beta}_1$ coefficient on good economic news is statistically significant for all five industries shown (pooled t-statistics are: 7.084, 5.037, 6.973, 5.436 and 3.805 respectively).

The asymmetric timeliness exhibited by *EARN* for the five industries shown appears not to originate from working capital accruals (*ΔWCAP*). The bad news coefficient $\hat{\gamma}_1$ is not statistically different from zero in any of the five cases. Also, the good news coefficient $\hat{\beta}_1$ is not statistically different from zero for the "Building materials" and "Business support" industries. However, special items (*SPEC*) show high asymmetric timeliness of these items in respect to bad news. In four out of five industries (the exception being "Building materials"), the $\hat{\gamma}_1$ coefficient is statistically significant (pooled t-statistics are: 1.245, 4.727, 2.730, 5.745 and 2.004 respectively). Similar results are obtained if the total accruals *Accruals* (*tot.*) figure is considered, again the exception being the "Food processing" industry.

Overall, the pooled results by industry are consistent with the results obtained by cross-sectional estimations of the contemporaneous model of accounting conservatism: there is no asymmetry in reflecting good and bad economic news in operating cash flow, earnings exhibit high asymmetric timeliness in earnings. This asymmetry is clearly reflected in the accruals component of earnings, although results presented in Figure 5-1 differ from the general results regarding the source of this asymmetry – *ΔWCAP* appear not to play a significant role in these industries, as opposed to the general results (see, for example, Table 4-8). However, the results reinforce the notion that accruals overall and special items (*SPEC*) make earnings more timely than cash flows in reflecting bad economic news.

Notwithstanding the limitations of this industry-specific analysis of conservatism (in particular, the industry selection), An analysis of industry-specific ex-post conservatism after controlling for industry-specific levels of ex-ante conservatism is also provided. This is achieved by separating observations within an industry by pooled low/high opening book-to-market ratio. Such an analysis should yield very precise results in terms of controlling for effects such as conditions on input and output markets, technology and business risk (Martikainen, 1997).

As in section 4.9.1, it is predicted that the higher the book-to-market ratios within an industry, the more assets are recognised on the balance sheet, the more likely it is that news relates to these items and the more asymmetric the response to bad news. The results of this analysis are shown in Table 5-2 for the earnings after extraordinary and exceptional items (*EARN*) as the dependent variable only.

Table 5-2: Industry-specific asymmetric response of earnings, controlled by the industry-specific levels of ex-ante conservatism, pooled, 1969-2001

Industry	Opening B/M rank	n	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Building materials	Low	501	**0.087**	0.004	**0.027**	**0.117**	**0.129**	0.144	5.303
			14.569	0.469	**2.067**	**4.054**	**24.432**		
	High	500	**0.086**	-0.024	**0.104**	-0.055	**0.136**	0.049	0.471
			7.550	-1.265	**5.583**	-0.958	**25.922**		
Business support	Low	733	**0.067**	0.005	**0.027**	**0.107**	**0.183**	0.134	4.941
			16.471	0.709	**3.740**	**5.727**	**54.531**		
	High	732	**0.086**	0.020	**0.071**	**0.128**	**0.121**	0.199	2.798
			10.656	1.396	**5.569**	**2.942**	**33.410**		
Electronic equipment	Low	598	**0.064**	0.013	0.019	**0.143**	**0.183**	0.162	8.327
			11.713	1.597	1.939	**6.652**	**44.471**		
	High	598	**0.075**	0.006	**0.058**	**0.213**	**0.215**	0.271	4.676
			8.329	0.409	**4.503**	**5.107**	**54.264**		
Engineering, general	Low	1,046	**0.098**	-0.001	-0.015	**0.193**	**0.114**	0.178	-12.044
			17.425	-0.080	-1.249	**8.086**	**44.575**		
	High	1,045	**0.103**	-0.009	**0.113**	**0.160**	**0.194**	0.273	2.409
			11.152	-0.577	**7.264**	**3.468**	**83.621**		
Food processing	Low	500	**0.091**	-0.013	0.017	**0.110**	**0.161**	0.127	7.511
			15.552	-1.328	1.431	**3.949**	**31.762**		
	High	499	**0.119**	0.010	**0.104**	**0.141**	**0.170**	0.244	2.357
			12.235	0.620	**5.982**	**2.416**	**33.829**		

Notes. Estimated models are: $EARN_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where *EARN* is undeflated per share earnings after extraordinary and exceptional items, $RET_{t,t-1} = (P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1} \leq$ {1 if $RET_t \leq 0$; 0 otherwise}. All variables are deflated by opening share price P_{t-1}. All coefficients' estimates are pooled cross-sectional time series for the period 1969-2001. Opening book-to-market value is calculated within each industry on a pooled basis.

In the industries "Business support", "Electronic equipment" and "Food processing" the good news coefficient $\hat{\beta}_1$, the bad news coefficient $\hat{\gamma}_1$ and the total response to bad news $\hat{\beta}_1+\hat{\gamma}_1$ is higher for the high book-to-market group than for the low book-to-market group. The response to good news is delayed and in all cases the asymmetric timeliness of *EARN* to bad news is significant.

Similar results also hold for the other industries with two exceptions. First, in the high book-to-market group within "Building materials" the bad news coefficient $\hat{\gamma}_1$ is of the wrong sign and statistically insignificant. Second, in the "Engineering, general" industry, the low book-to-market group shows a smaller asymmetric timeliness as evidenced by the size of the incremental bad news coefficient. However, the total bad news coefficient $\hat{\beta}_1 + \hat{\gamma}_1$ is higher for this group, consistent with expectations. Also, the relative bad news coefficients are not higher for the high book-to-market group within any of the five industries, an observation consistent with the overall results in Table 4-19 and asset-specific measures of ex-ante conservatism in Table 4-20.

There are at least three reservations that might be put forward against such a method to study industry differences. First, in some cases ("Electrical equipment") and some years, the number of observations is small (in particular in the 1969-1972 period). While the pooled method of estimation should help to reduce this problem, it cannot by itself eliminate it. Moreover, it also re-introduces other problems in interpretation of the regression results that the Fama and MacBeth (1973) method reduces. Second, the selection of industries is arbitrary and might not be descriptive of the entire UK sample of publicly-quoted companies. It is also likely that a selection of more contrasting industries in terms of operating characteristics and levels of ex-ante conservatism may yield a clearer picture of industry differences. Third, other alternatives might be developed to study inter-industry differences – for example, Platt and Platt (1990) suggest standardisation by dividing a firm's financial ratio with a corresponding mean of industry-wide ratios. In the context of this study, this might be done by dividing each return and each dependent variable with an industry mean. However, again, there are issues regarding the dependent variables in non-December fiscal year-end firms. While these limitations are acknowledged, the results appear sufficiently robust to provide an overview of some of the industry differences and the generality of the asymmetric timeliness relations presented in the main part of this thesis.

5.4 THE ISSUE OF NON-DECEMBER YEAR-END OBSERVATIONS

The two main samples used in this study include significant proportions of non-December fiscal year-end firms. Since the ex-dividend returns are cumulated over fiscal periods rather than over periods designated to capture the full impoundment of information from the market into accounting numbers, this implies that the estimated regression coefficients are not independent over time. Cross-sections from adjacent years are likely to contain at least some common influences from both the current and the preceding calendar year. For example, for a firm whose accounting year ends on the 31/03/2001 and has not switched the year end during the last year, the returns are cumulated starting on the 31/03/2000, i.e., the preceding calendar year. The cross-section for year 2001 would therefore contain some general effects that stem from the year 2000. To avoid this problem, both Basu (1997) and Pope and Walker (1999) use only December 31st firms and, in addition, Basu (1997) corrects not only the returns, but also the accounting earnings (i.e., dependent) variables for market-wide effects.

In the case of the samples employed in this study, this is not feasible. An attempt to control for possible differences between December and non-December year-end observations is made by introducing incremental and interactive dummy variables for each independent variable (i.e., returns and returns multiplied by the bad news dummy) in each of the models using different earnings and earnings components as dependent variables. The contemporaneous version of the models can therefore be augmented as follows:

$$\frac{X_t}{P_{t-1}} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \delta_1 NONDECYE + \\ + \delta_2 NONDECYE \cdot D_{t,t-1} + \delta_3 NONDECYE \cdot RET_{t,t-1} + \\ + \delta_4 NONDECYE \cdot D_{t,t-1} \cdot RET_{t,t-1} + u_t \qquad (5\text{-}2)$$

where the dummy variable *NONDECYE* assumes the value of one if the accounting year-end is *not* on the 31st of December and zero otherwise. If there are any systematic effects that relate in particular to non-December fiscal year-ends, some of the estimated coefficients $\hat{\delta}_1$ to $\hat{\delta}_4$ will be statistically significant, although it is not possible to form *a priori* expectations as to the magnitude and sign of these estimated coefficients. A compounding factor is that *NONDECYE* factors capture different year-ends, ranging from January up to the 30th of December.

The results of estimating the above equation (5-2) are presented in Table 5-3. This table is intended to be compared directly with the unrestricted results in Table 4-8 and to be indicative of the effects of non-December year-end firms on lagged results presented in Table 4-11. The main conclusion from this analysis is that the overall results are unaffected by controls for non-December fiscal year-ends. This is evidenced by the statistical insignificance of the estimated regression coefficients of

Table 5-3: Contemporaneous models of ex-post accounting conservatism by earnings and earnings components, controlled for the possible effects of non-December year-end observations, 1969-2001

Dependent variable	*avg. n*	α_1	α_2	β_1	γ_1	δ_1	δ_2	δ_3	δ_4	R^2
Operating cash flows										
OCF	784.5	**0.225**	0.003	**0.104**	0.045	0.010	-0.006	-0.041	0.042	**0.064**
		14.096	0.318	**7.974**	1.379	1.471	-0.726	-1.488	0.938	**8.926**
Earnings										
OP	784.5	**0.207**	0.003	**0.103**	**0.140**	0.011	-0.017	-0.040	0.024	**0.170**
		11.384	0.674	**8.119**	**7.962**	1.244	-1.831	-1.222	0.588	**15.319**
ORD	784.5	**0.099**	0.003	**0.059**	**0.128**	0.001	-0.008	-0.019	-0.010	**0.205**
		15.346	1.059	**8.880**	**10.964**	0.198	-1.565	-0.983	-0.384	**17.335**
EARN	784.5	**0.096**	0.006	**0.058**	**0.184**	0.001	-0.009	-0.018	-0.019	**0.177**
		14.060	1.704	**8.970**	**10.996**	0.274	-1.632	-0.837	-0.639	**17.277**
Accruals										
ΔWCAP	784.5	**0.053**	0.002	**0.018**	**0.082**	0.002	-0.010	-0.011	0.017	**0.026**
		6.614	0.408	**2.211**	**3.546**	0.209	-0.847	-0.685	0.444	**9.756**
ΔWCAP components:										
- of which *ΔDebtors*	784.5	**0.062**	0.004	**0.036**	**0.095**	-0.009	0.003	0.022	-0.053	**0.030**
		8.223	0.607	**4.451**	**2.492**	-1.664	0.391	0.804	-0.968	**13.584**
- of which *ΔStock*	784.5	**0.055**	0.000	**0.024**	**0.058**	0.002	-0.004	**0.026**	-0.012	**0.028**
		5.978	0.045	**3.474**	**2.986**	0.266	-0.383	**2.127**	-0.502	**11.252**
-of which *ΔCreditors*	784.5	**-0.063**	-0.002	**-0.042**	-0.071	0.009	-0.009	-0.059	0.082	**0.029**
		-7.036	-0.322	**-4.304**	-1.997	1.145	-1.496	-1.324	1.445	**11.344**
DEP	784.5	**-0.076**	-0.002	**-0.020**	0.009	0.000	0.000	**0.013**	-0.020	**0.029**
		-17.449	-0.736	**-5.696**	0.879	-0.136	0.078	**2.067**	-1.508	**7.824**
SPEC	784.5	-0.003	0.002	-0.008	**0.063**	-0.004	0.000	0.000	-0.022	**0.031**
		-1.297	1.415	-2.003	**6.375**	-2.001	-0.149	-0.039	-1.613	**7.954**

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2D_{i,t-1}+\beta_1RET_{i,t-1}+\gamma_1D_{i,t-1}RET_{i,t-1}+\delta_1NONDECYE_t+\delta_2NONDECYE_tRET_{i,t-1}+\delta_3NONDECYE_tD_{i,t-1}RET_{i,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{i,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{i,t-1}=$ {1 if $RET_{i,t-1}\leq 0$; 0 otherwise}. All variables are deflated by the opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$.

additive and interactive *NONDECYE*-dummies $\hat{\delta}_1$ to $\hat{\delta}_4$. In particular, operating cash flows (*OCF*) reflect news symmetrically, bad news is reflected in all three earnings figures significantly faster than good news. The asymmetric timeliness is highest for the *EARN* figure, as expected, followed by the *OP* and *ORD* figures, as in the main results. Most of this asymmetric timeliness is captured by working capital accruals (*ΔWCAP*) and special items (*SPEC*). If anything, the asymmetry is strengthened with the introduction of the *NONDECYE* dummy (e.g., in the case of *ORD* and *EARN*). The only marginally significant exception is the *ΔCreditors* accruals component, where the statistical significance decreases to just below 5%. The average R^2s increase marginally with the introduction of these dummy variables in the conservatism models.

5.5 MARKET-ADJUSTED RETURNS, YIELD CURVES AND CONSERVATISM

Basu (1997) provides additional sensitivity analyses in estimating the contemporaneous models on earnings by excluding market-wide effects. He subtracts the equally-weighted CRSP index from firm-specific ex-dividend returns (the independent variable) and an equally-weighted index of earnings-to-price ratios from a firm's earnings-to-price ratio (the dependent variable). The second adjustment in particular is possible because he uses only December 31st observations in his sample and this allows various market-wide forms of earnings-to-price ratios to be formed. In the sample in this study it would be difficult to calculate a representative average X_t/P_{t-1} ratio for all firms. There are a large number of non-

December year-ends in the sample and, in addition, the lengths and "positions" of returns-accumulation periods vary significantly (section 4.2 contains a detailed description of the sample in this respect). However, an attempt to adjust the ex-dividend returns for market-wide influences is made on an individual-observation basis. From the return $RET_{it,\,t-1}$ each firm i and each fiscal period (t, t–1), the percentage change in the FTSE All Share index is subtracted:

$$MRET_{it,t-1} = RET_{it,t-1} - \Delta\% FTSE\ All\ Share_{it,t-1} \qquad (5\text{-}3)$$

where $\Delta\% FTSE\ All\ Share$ is the percentage change in the FTSE All Share index over the corresponding fiscal period (t, t–1). Given that the lengths of accounting periods are allowed to vary by 365±91 days, the percentage changes in the index level are calculated separately for every firm and every fiscal year-end (subscripts in equation (5-3) are used in full to emphasise this particular "individual-treatment" procedure). Similarly, for the lagged model, the marked-adjusted returns *MRET*s are defined as:

$$MPET_{it-\tau,t-\tau-1} = PET_{it-\tau,t-\tau-1} - \Delta\% FTSE\ All\ Share_{it-\tau,t-\tau-1} \qquad (5\text{-}4)$$

where $\tau = 0,\ldots, 3$. All $MRET_{t-\tau,t-\tau-1}$ variables are deflated by P_{t-4} and each periodic change of the index is also deflated by the level of the index at time t–4 to maintain deflator-period consistency.

In addition to market-adjusted returns, the yields on 91-day UK Treasury bill and the average gross redemption yield on 10-year UK gilts collected on the latest date available immediately prior to the balance sheet date are also included.

Effectively, the inclusion of these two rates of return is an attempt to incorporate a proxy for the expected economic environment as reflected by the (partial) yield curve. This concept has been presented and used in related literature by, for example, Fama and French (1989) and McCown (1999) and has been found to correlate with the probability of an increasing/decreasing stock market (Resnick and Shoesmith, 2002). Alternatively, Lev and Thiagarajan (1993) use the inflation rate and GNP growth (the former is used in this study for illustrative purposes, although it must be noted that its effect should also be reflected both in returns and in bond yields). It is acknowledged there are at least two problems related to this approach. First, there are no strict theoretical derivations that would model the incorporation of either the index return or the yield curve in variants of the Pope and Walker (1999) model. Second, it is possible that noise is introduced due to imperfect measurements of these economic constructs and in particular timing differences. This latter problem results from an imperfect matching of the balance sheet date and the date on which (or the period for which) the government securities' data is collected. This might introduce the errors-in-variables problem described in section 2.3.1 and introduce the attenuation bias in all regression coefficients. Given the data structure and the methods used in this thesis, however, these problems cannot be dealt with and thus represent a caveat in interpreting the results presented below.

The empirical versions of the contemporaneous and lagged models are:

$$\frac{X_t}{P_{t-1}} = \alpha_0 + \alpha_1 DM_{t,t-1} + \beta_1 MRET_{t,t-1} + \gamma_1 DM_{t,t-1} MRET_{t,t-1} + \psi_1 UKTRSBL_t + \\ + \psi_2 UKMEDYLD_t + \varepsilon_t \tag{5-5a}$$

and, for the lagged version:

$$\frac{X_t}{P_{t-4}} = \alpha_0 + \alpha_1 DM_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \beta_{\tau+1} MPET_{t-\tau,t-\tau-1} + \sum_{\tau=0}^{3} \gamma_\tau MPET_{t-\tau,t-\tau-1} DM_{t-\tau,t-\tau-1} + \psi_1 UKTRSBL_t + \psi_2 UKMEDYLD_t + \varepsilon_t \quad (5\text{-}5b)$$

where the bad-news indicator variables $DM_{t-\tau,t-\tau-1}$ are defined according to the sign of the respective $MPET_{t-\tau,t-\tau-1}$ adjusted returns. The main difference between market-adjusted returns models with *MRET*/*MPET* independent variables and the unadjusted returns models with *RET*/*PET* as independent variables is that the estimated regression constant $\hat{\alpha}_0$ and, if significant, the incremental regression constant for bad news $\hat{\alpha}_1$, should be higher, but the estimated regression slopes should not be affected significantly (the $\hat{\beta}$ and $\hat{\gamma}$ coefficients in both versions of the models). Geometrically, this should be the case, because from the same unadjusted dependent variable, a "constant" is subtracted from the explanatory variable, effectively switching the regression line to the left, causing it to cross the y-axis at a higher level than with the unadjusted explanatory variables.[91] If the yield-curve variables capture some of the correlated omitted factors from regressions (5-5a) and (5-5b), then the $\hat{\beta}$ and $\hat{\gamma}$ coefficients should increase in absolute value. If, on the other hand, the yield-curve variables capture some *un*-correlated omitted factors from then the $\hat{\beta}$ and $\hat{\gamma}$ coefficients should remain un-changed, but the R^2s should increase.

[91] The term "constant" is in quotes because individual values of the index are subtracted from firm-time-specific returns. The term would, however, be a strict constant should all firms end the fiscal year at the same time and all have equal fiscal-period lengths.

The results presented in Table 5-4 are a mixture of these effects. First, in all ten regressions, the R^2s increase compared to the basic set of results in Table 4-8, which would suggest that the combined effect of adjustment to capital market movements and short- and long-term interest rates represent at least to a certain extent some uncorrelated factors omitted from analyses in the main part of this research. The contribution is, however, modest, in line with the fact that only two individual $\hat{\psi}$ coefficients are statistically significant out of a total $10 \cdot \hat{\psi}_1 + 10 \cdot \hat{\psi}_2 = 20$ $\hat{\psi}$ coefficients. Second, while the response to good news increases for measures *OCF*, *OP*, *ORD* and *EARN* the asymmetry in response to bad news decreases. The relations among the respective good and bad news coefficients remain unchanged from the main analyses. For example, the asymmetric timeliness is highest for the *EARN* variable, followed by *OP* and *ORD*, while the expectation is *ORD* first and then *OP*. Third, similar conclusions apply also to the accruals components. For example, the estimated coefficient on good news in the *SPEC* regression becomes higher in absolute value (i.e., more earnings-decreasing) than in the basic analyses, which re-confirms and strengthens the result obtained previously that the arrival of good economic news coincides with firms employing some earnings-decreasing methods to reduce reported earnings in the current period.

A final note that relates to the market-adjusted contemporaneous sample relates to the average number of firms per year. Compared to the unadjusted contemporaneous sample, the average number of observations is slightly higher: 784.7 compared to 784.5 for the un-adjusted sample, the number being higher in 12 out of 33 years. Thus, it would appear that the adjustments made also have the effect of reducing the "degree of extremity" of the sample that possibly arises also as a consequence of the sample-construction/outlier-removal procedures employed.

Table 5-4: Contemporaneous models of ex-post accounting conservatism by earnings and earnings components, adjusted for general market movements and short and long-term interest rates, 1969-2001

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\psi}_1$	$\hat{\psi}_2$	R^2
Operating cash flows								
OCF	784.7	**0.333**	0.003	**0.105**	0.008	-0.082	-0.999	**0.065**
		4.368	0.733	6.468	0.313	-0.074	-1.529	8.722
Earnings								
OP	784.7	**0.242**	0.003	**0.119**	**0.092**	-0.218	-0.173	**0.170**
		4.222	0.920	7.635	5.588	-0.249	-0.300	16.407
ORD	784.7	**0.115**	0.002	**0.063**	**0.089**	-0.150	-0.029	**0.206**
		3.349	0.919	8.201	8.274	-0.348	-0.084	17.796
EARN	784.7	**0.096**	0.005	**0.061**	**0.135**	-0.036	0.057	**0.177**
		2.462	1.493	7.657	8.669	-0.073	0.136	16.718
Accruals								
ΔWCAP	784.7	-0.015	0.003	**0.034**	**0.065**	-0.076	0.741	**0.032**
		-0.356	0.757	4.300	4.019	-0.253	1.638	6.999
ΔWCAP components:								
- of which *ΔDebtors*	784.7	-0.050	0.001	**0.051**	**0.051**	0.150	0.928	**0.041**
		-0.970	0.467	6.954	2.774	0.477	2.026	8.304
- of which *ΔStock*	784.7	**-0.088**	-0.003	**0.035**	**0.061**	0.088	**1.340**	**0.035**
		-2.202	-0.726	4.388	3.619	0.264	3.172	8.369
-of which *ΔCreditors*	784.7	0.123	0.004	**-0.052**	**-0.046**	-0.315	**-1.527**	**0.036**
		2.029	1.179	-6.389	-2.190	-0.807	-2.475	9.219
DEP	784.7	**-0.079**	-0.003	**-0.023**	**0.021**	-0.103	0.125	**0.028**
		-3.785	-1.962	-5.421	2.997	-0.374	0.636	7.362
SPEC	784.7	-0.023	0.003	**-0.011**	**0.049**	0.164	0.063	**0.028**
		-1.495	2.037	-3.019	6.578	1.008	0.318	7.085

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1 + \alpha_2 DM_{t,t-1} + \beta_1 MRET_{t,t-1} + \gamma_1 DM_{t,t-1} MRET_{t,t-1} + \psi_1 UKTRSBL_t + \psi_2 UKMEDYLD_t + \varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $MRET_{t,t-1} = (P_t - P_{t-1})/P_{t-1} - \%\Delta FTSE\ All\ Share_{t,t-1}$ and $DM_{t\ t,t-1} = \{1 \text{ if } RET_t \leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$.

The results obtained from market- and yield-adjusted lagged models (presented below in Table 5-5) are also consistent with the un-adjusted results presented in Table 4-11. The good news coefficients on earnings increase monotonically for all three earnings measures, as expected. The incremental bad news coefficients decrease monotonically toward zero and are significant up to two lags (three periods) for the *ORD* and *EARN* measures and up to one lag (two periods) for the *OP* measure. This result is qualitatively identical to the unadjusted results. The estimated coefficients on good news in the operating cash flows (*OCF*) equation also increase, albeit with a slight unexplained deviation at lag one. Regarding the working capital accruals *ΔWCAP*, the good news coefficients generally increase and it exhibits asymmetric timeliness in respect to current-period bad news. There is no asymmetry for further lags, consistent with current-period bad news being impounded through *ΔWCAP* in current-period earnings. Of the individual *ΔWCAP* components, interestingly, none exhibits asymmetric timeliness in the current period (the $\hat{\gamma}_1$ coefficient). However, the $\hat{\gamma}_2$ coefficient at lag one in the *ΔStock* equation is statistically significant, consistent with the un-adjusted results (see Table 4-11). Also, if the exact significance level of 0.079 (corresponding to the test statistic of t= 1.813) were acceptable, the results for bad news would be qualitatively identical to the un-adjusted results.

Overall and bearing in mind the difficulties related to adjustments made in this section, the correction for the general return on the market, measured by the percentage change in the *FTSE All Share* index and the inclusion of short- and long-term interest rates does not appear to have a material effect on the results in the main part of this research. The results thus appear to be robust to changing general economic conditions as proxied for with the adjustments for index return and government bond yields.

Table 5-5: Lagged models of ex-post accounting conservatism by earnings and earnings components, adjusted for general market movements and short and long-term interest rates, 1969-2001

Dependent variables	*avg. n*	α_1	α_2	β_1	β_2	β_3	β_4	γ_1	γ_2	γ_3	γ_4	$\hat{\psi}_1$	$\hat{\psi}_2$	R^2
Operating cash flows														
OCF	634.4	**0.591**	-0.008	**0.082**	**0.068**	**0.119**	**0.167**	0.002	0.012	-0.016	**-0.072**	-1.606	-1.739	**0.194**
		4.901	-1.191	**5.786**	**5.538**	**8.154**	**8.050**	0.116	0.596	-0.757	**-2.321**	-1.424	-1.700	**18.302**
Earnings														
OP	634.4	**0.449**	**-0.013**	**0.101**	**0.119**	**0.140**	**0.174**	**0.045**	**0.039**	0.013	**-0.048**	-0.935	-0.769	**0.392**
		6.047	**-2.211**	**7.153**	**8.975**	**9.130**	**9.051**	**2.961**	**2.804**	0.618	**-2.210**	-1.231	-1.067	**26.784**
ORD	634.4	**0.223**	**-0.010**	**0.056**	**0.065**	**0.078**	**0.095**	**0.043**	**0.043**	**0.024**	-0.012	-0.425	-0.319	**0.433**
		5.765	**-2.701**	**8.378**	**10.710**	**11.114**	**10.313**	**6.034**	**5.323**	**2.344**	-1.109	-1.207	-0.775	**26.628**
EARN	634.4	**0.241**	**-0.012**	**0.052**	**0.068**	**0.077**	**0.105**	**0.072**	**0.064**	**0.042**	-0.012	-0.299	-0.582	**0.369**
		5.123	**-2.876**	**7.320**	**11.101**	**10.094**	**12.068**	**7.329**	**6.599**	**3.249**	-1.050	-0.757	-1.298	**30.223**
Accruals														
ΔWCAP	634.4	-0.007	-0.007	**0.028**	**0.063**	**0.048**	**0.051**	**0.034**	0.021	0.018	0.001	0.430	0.653	**0.095**
		-0.082	-1.290	**2.979**	**6.878**	**3.829**	**2.816**	**2.283**	1.379	0.811	0.022	0.725	0.769	**13.597**
ΔWCAP components:														
- of which *ΔDebtors*	634.4	0.001	-0.004	**0.049**	**0.068**	**0.058**	**0.058**	0.006	-0.016	-0.021	**-0.046**	0.228	0.410	**0.115**
		0.012	-0.655	**6.117**	**8.088**	**4.188**	**4.052**	0.386	-0.852	-1.062	**-2.256**	0.455	0.587	**12.640**
- of which *ΔStock*	634.4	-0.014	**-0.010**	**0.038**	**0.052**	**0.043**	**0.056**	0.028	**0.034**	0.018	-0.032	0.049	0.977	**0.095**
		-0.181	**-2.219**	**5.454**	**4.862**	**3.479**	**4.215**	1.813	**2.478**	0.790	-1.715	0.081	1.451	**12.959**
-of which *ΔCreditors*	634.4	0.006	0.006	**-0.059**	**-0.057**	**-0.053**	**-0.064**	0.001	0.003	0.021	**0.079**	0.153	-0.734	**0.094**
		0.048	1.239	**-7.252**	**-5.483**	**-3.320**	**-4.050**	0.025	0.186	0.912	**3.563**	0.233	-0.804	**13.068**
DEP	634.4	**-0.136**	0.003	**-0.009**	**-0.015**	**-0.027**	**-0.046**	0.009	0.007	0.009	0.028	0.249	0.249	**0.104**
		-4.167	1.014	**-3.300**	**-4.185**	**-6.086**	**-8.133**	1.748	1.127	1.305	3.317	0.846	0.926	**13.674**
SPEC	634.4	0.016	-0.001	**-0.009**	0.000	-0.004	0.006	**0.030**	**0.024**	**0.021**	0.011	0.071	-0.198	**0.058**
		0.696	-0.970	**-3.169**	-0.127	-0.794	1.064	**5.624**	**5.270**	**2.846**	1.467	0.352	-0.706	**14.360**

Notes. Estimated models are: $X_t/P_{t-1}=\alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1}PET_{t,t-1}+\gamma_2 D_{t-1,t-2}PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3}PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4}PET_{t-3,t-4}+\psi_1 UKTRSBL_t+\psi_2 UKMEDYLD_t+\varepsilon_t$ where X_t is an undeflated dependent variable listed in the leftmost column of table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $MPET_{t-\tau,t-\tau-1}=(P_{t-\tau}-P_{t-\tau-1})/P_{t-\tau}-\%\Delta FTSE\ All\ Share_{t-\tau,t-\tau-1}$ and $DM_{t-\tau,t-\tau-1}=\{1$ if $MPET_{t-\tau,t-\tau-1}\leq 0$; 0 otherwise$\}$.. All dependent variables are deflated by opening share price P_{t-1}. Avg. *n* is the average number of observations per year. All estimates and R^2s are cross–sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1= 32 d.f., i.e., $|t|>2.0369$.

5.6 AN ALTERNATIVE PROXY FOR EX-ANTE CONSERVATISM

The book-to-market ratio is used in section 4.9.1 to capture the overall levels of ex-ante conservatism, based on Pope and Walker (2003). In section 4.9.2, this is developed further by including asset-specific measures of ex-ante conservatism. In both versions, a highly ex-ante conservative firm expenses a high proportion of assets at the time the investment is made. Accordingly, the proportion of recorded assets (i.e., book value of assets) relative to total economic assets (i.e., cash-generating assets, the market value) should be low. However, there are at least two additional observations that can be made about the book-to-market ratio as a measure of ex-ante levels of conservatism.

First, the value of the ratio depends, among other things, also on leverage. Kim and Ritter (1999) show that the effects of leverage are important in certain applications of valuations with relatives. Second, in the context of the scale issues presented in section 2.3.2, the market value of a firm's equity used to calculate the ratio can be viewed merely as one of the many possible size deflators with which to deflate the book value of equity. Easton and Sommers (2000, Figures 5 and 6) show that deflation by lagged market value and deflation by current-period sales produce very similar scale-reduction effect. Accordingly, the (lagged) market value of a firm's equity used as a deflator might be substituted with some other measure of size.[92] This represents a "technical" rationale to decompose the book-to-market ratio, and other measure of scale (i.e., other deflators) might be used.

Garrod and Valentincic (2001) present one such generic decomposition of the book-to-market ratio:

$$(BV / P) = (S / P) \cdot (BV / S) \qquad (5\text{-}6)$$

where S is the total sales per share, BV is the book value of equity per share and P is the share price. Stock variables used to capture the levels of ex-ante conservatism would generally refer to their opening values at time (t–1). Likely, the use of any flow variables in these measure should include lagged values of these flow variables i.e., in time interval (t–1, t–2). However, the decomposition is more general and in principle valid regardless of whether closing or opening values are used.

Ranking observations by the book-to-sales ratio, BV/S, should produce similar results as with the book-to-market ranking, given that both the BV/P ratio and the BV/S ratios represent measures of assets in place that were subjected to ex-ante accounting practices at the time the investment was made and the original cost recorded in the balance sheet. The two ratios differ, given the "technical" background presented above, only by the type of size deflator. On the other hand, the sales-to-price ratio S/P can be viewed as a proxy measure of future growth potential

[92] It must be stressed that the book-to-market ratio used in this research is the "opening" book-to-market ratio, i.e., lagged book value per share is divided by the adjusted price per share at the previous balance-sheet date.

– dividing the inverse of the *S/P* ratio, the *P/S* ratio, by the net profit margin *E/S* yields the price-earnings ratio:

$$(P/S)/(E/S) = (P/E) \quad (5\text{-}7)$$

A low *P/S* ratio (or, equivalently, a high *S/P* ratio) is viewed by "contrarian" investors as a good investment opportunity given that future improvement in profit margins improves earnings and increases future *P/E* ratios (Siva, Kumar and Jayaraman, 2001; Chou and Liao, 1996; Senchack and Martin, 1987).

Literature also states that an important advantage of using the *P/S* ratio instead of the *P/E* ratio is that the *P/S* ratio is less open to manipulation given that it can only be managed by varying the revenue recognition methods (Siva, Kumar and Jayaraman, 2001).[93] This implies that most of the accounting effects should be captured via the other component of book-to-market ratio, the book value of equity *BV* relative to sales *S*, where the sales figure acts technically as a deflator. The existence of growth opportunities should not be timely incorporated in earnings, since these options must first be realised and only then can they be included in financial statements. Market values, on the other hand, recognise the value of these options immediately and the lag between market values and financial statements may be significant (Beekes, Pope and Young, 2003).

To test for possible effects of changing the proxy for the level of ex-ante conservatism on the effects of ex-post conservatism, the following procedure is

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[93] The actual term used in the source is »manipulated« rather than managed.

applied. As in sections 4.9.1 and 4.9.2 and following the decomposition in (5-6), the opening values of book-to-market, book-to-sales and sales-to-price are calculated at the beginning of each sample year 1969-2001. Firms are then sorted for each of the three sorting variables into tertiles and the contemporaneous versions of the Pope and Walker (1999) model are run for each accounting variable to avoid the errors in variables problem. Finally, the Fama-MacBeth (1973) method is applied to calculate the average values of the coefficients, the *t*-statistics and determine the statistical significance of results presented in Table 5-6.[94]

Starting from the earnings after extraordinary and exceptional items (*EARN*), the results show that the asymmetric sensitivity of *EARN* to bad news (and good news) increases as the book-to-market ratio increases, i.e., as more and more assets are recognised on the balance sheet, the asymmetry measured by either the incremental $\hat{\gamma}_1$ or the total bad news coefficient $\hat{\beta}_1 + \hat{\gamma}_1$, increases also. Quantitatively almost identical and qualitatively identical results are obtained by sorting the observations by the sales-to-price ratio. Therefore, the *BV/P* and *S/P* ratios appear to capture the same underlying factor. The asymmetry is highest for the high *S/P*-ratio values, consistent with the ratio capturing growth opportunities – where the *S/P* is high, there should be fewer opportunities for future growth, more timeliness and more asymmetric timeliness. Interestingly, the sort by the *BV/S* ratio does not produce consistent results and, taking the total bad news coefficient, it can be observed that the response to bad news is in fact decreasing across tertiles.

[94] The significance is not determined for the total bad news coefficient $\hat{\beta}_1 + \hat{\gamma}_1$ as these are sums of average coefficients and not averages of sums of coefficients.

Table 5-6: The effect of the decomposition of the book-to-market proxy for ex-ante conservatism on contemporaneous models of ex-post conservatism by earnings' components, 1969-2001

Dep. variable	Rank	Book-to-market			Book-to-sales			Sales-to-price		
		$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$
Operating cash flows										
	Smallest	**0.041**	**0.084**	0.125	**0.101**	0.091	0.192	-0.019	**0.151**	0.132
OCF	Mid	0.198	-0.091	0.108	0.050	0.118	0.169	**0.121**	0.014	0.136
	Highest	**0.130**	-0.050	0.080	**0.079**	0.078	0.157	**0.075**	0.029	0.104
Earnings										
	Smallest	0.022	**0.157**	0.179	**0.113**	**0.161**	0.274	0.007	**0.178**	0.185
OP	Mid	**0.142**	0.111	0.254	0.067	**0.192**	0.258	**0.086**	**0.135**	0.221
	Highest	**0.128**	**0.141**	0.269	0.024	**0.190**	0.213	0.078	**0.229**	0.307
	Smallest	0.020	**0.110**	0.130	**0.069**	**0.115**	0.184	0.016	**0.108**	0.124
ORD	Mid	**0.077**	**0.136**	0.213	0.039	**0.143**	0.182	**0.046**	**0.122**	0.168
	Highest	**0.081**	**0.143**	0.225	0.011	**0.147**	0.158	**0.057**	**0.194**	0.252
	Smallest	**0.037**	**0.129**	0.166	**0.074**	**0.188**	0.262	**0.024**	**0.129**	0.154
EARN	Mid	**0.079**	**0.202**	0.281	0.035	**0.198**	0.232	**0.044**	**0.183**	0.227
	Highest	**0.083**	**0.224**	0.307	**0.041**	**0.159**	0.200	**0.062**	**0.275**	0.337
Accruals										
	Smallest	-0.026	0.081	0.054	0.029	**0.096**	0.125	0.016	0.035	0.051
ΔWCAP	Mid	0.006	**0.110**	0.116	**0.027**	**0.085**	0.111	-0.029	0.102	0.073
	Highest	0.019	**0.156**	0.175	-0.054	0.105	0.051	0.009	**0.208**	0.217
– of which	Smallest	0.004	0.068	0.072	**0.044**	**0.102**	0.146	0.001	0.047	0.048
ΔDebtors	Mid	-0.008	**0.133**	0.125	**0.063**	0.051	0.114	**0.039**	0.025	0.063
	Highest	**0.029**	0.138	0.167	-0.050	0.098	0.048	0.031	**0.172**	0.203

Cont.

		Book-to-market			Book-to-sales			Sales-to-price		
		$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$	$\hat{\beta}_1$	$\hat{\gamma}_1$	$\hat{\beta}_1+\hat{\gamma}_1$
– of which *ΔStock*	Smallest	0.013	0.027	0.040	**0.033**	**0.120**	0.154	0.043	-0.017	0.026
	Mid	0.001	0.048	0.050	0.015	0.057	0.072	**0.027**	0.005	0.032
	Highest	**0.040**	**0.139**	0.179	-0.019	0.062	0.043	-0.008	**0.203**	0.195
– of which *ΔCreditors*	Smallest	**-0.043**	-0.014	-0.057	**-0.049**	**-0.126**	-0.175	**-0.029**	0.006	-0.023
	Mid	0.013	-0.071	-0.058	**-0.052**	-0.024	-0.075	**-0.095**	0.072	-0.023
	Highest	**-0.050**	-0.121	-0.171	0.015	-0.055	-0.040	-0.014	**-0.167**	-0.181
DEP	Smallest	0.007	-0.004	0.002	**-0.018**	-0.025	-0.044	0.009	-0.008	0.002
	Mid	-0.064	0.084	0.021	-0.013	-0.017	-0.030	**-0.010**	0.019	0.009
	Highest	**-0.022**	**0.038**	0.016	0.000	0.010	0.010	-0.008	-0.019	-0.027
SPEC	Smallest	0.014	0.015	0.029	-0.007	**0.072**	0.065	0.007	0.022	0.029
	Mid	-0.002	**0.070**	0.068	**-0.014**	**0.052**	0.038	-0.004	**0.055**	0.052
	Highest	-0.010	**0.080**	0.070	0.023	0.019	0.042	-0.006	**0.079**	0.073

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{i,t-1}+\beta_1 RET_{i,t-1}+\gamma_1 D_{i,t-1}RET_{i,t-1}$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{i,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{i,t-1} = \{1 \text{ if } RET_{i,t-1} \leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f., i.e., $|t|>2.0369$. Total estimated coefficients on bad news are sums of estimated β_1 and γ_1 coefficients. The opening values of book-to-market, book-to-sales and sales-to-price ratios are re-calculated every year and tertiles re-formed accordingly for each year 1969 to 2001.

Similar conclusions apply also to *ORD* and *OP* earnings measures. Overall, however, the results agree in that asymmetric timeliness in recognition of bad news is prevalent in all but one sub-partitions where one of the earnings measures is used as the dependent variable.

The asymmetric sensitivity to bad news for the *ΔWCAP* and *SPEC* accruals increases from lowest to highest book-to-market value and consistent results are also obtained with the *S/P*-sort. Again, the sort by the *BV/S* ratio does not produce consistent results. In terms of the difference between the total and incremental bad news coefficients the interpretation is difficult, given that the incremental coefficient is increasing and the total coefficient is decreasing as book-to-sales increases. The partitions where the *S/P* ratio is high, serve to emphasize the results obtained in earnings. Where there are a lot of value-relevant factors that are not yet included in financial statements (i.e., where the *S/P* is low) there should be more opportunities for future growth, but because these are not yet included in financial statements, accruals as well as earnings should exhibit less timeliness and less asymmetric timeliness than in partitions with high *S/P* values.

The operating cash flow equation *OCF* does not produce consistent results, but there are indications of asymmetric timeliness being present in the lowest book-to-market and sales-to-price tertile, both in contrast to expectations under conservative accounting.

To sum up, the asymmetric timeliness of earnings and its main accruals component increases as the level of ex-ante conservatism decreases, as measured by the book-to-market ratio. Identical results are also obtained by the sales-to-price ratio, but not, interestingly, by the book-to-sales ratio, contrary to expectations. This implies that the choice of the measure of ex-ante conservatism is important, but whether the variation in results is due to underlying economic factors or simply to bad proxies is a question that requires further research and is beyond the scope of this study. It must also be noted that other ex-ante conservatism measures are used in the literature. For example, Ahmed, Morton and Schaeffer (2000) use, on a firm-specific basis in the US, one minus the depreciation and amortisation over (essentially) fixed assets (tangible and intangible), R&D and advertising expenses over total sales and a LIFO inventory valuation indicator. Using the present sample in this study, only the first of these measures could have been used due to data availability.

5.7 EFFECTS OF METHOD OF ESTIMATION AND METHOD OF OUTLIER REMOVAL

5.7.1 Pooled regressions

The main advantage of the Fama and MacBeth (1973) regressions that are employed elsewhere in this study to make inferences is that the standard errors of the average regression coefficients include estimation errors due to the correlation of regression residuals across firms, producing larger standard errors and lower *t*-statistics as opposed to pooled cross-section time-series regressions (Fama and French, 2000; also Pope and Walker, 1999, Bernard, 1987, Christie, 1986). To show explicitly the differences of using the cross-sectional approach as opposed to the pooled method, the contemporaneous models are re-estimated by pooling all observations across time and space in a single regression and disregard any differences that may be due to these two dimensions (Gujarati, 2003, p. 641).

The pooled results of the contemporaneous model are presented below in Table 5-7. It must be stressed again that the gains from using the cross-sectional

Table 5-7: Pooled estimates of contemporaneous Pope and Walker (1999) models, 1969-2001

Dependent variable	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Operating cash flows							
OCF	**0.212**	0.003	**0.117**	0.013	**0.051**	**0.130**	1.111
	74.510	0.721	**24.092**	0.988	**461.121**	**10.590**	
Earnings							
OP	**0.188**	-0.003	**0.118**	**0.049**	**0.110**	**0.167**	1.415
	88.267	-0.929	**32.644**	**4.979**	**1,070.973**	**18.270**	
ORD	**0.092**	-0.002	**0.059**	**0.072**	**0.151**	**0.131**	2.224
	85.582	-1.161	**32.114**	**14.458**	**1,534.749**	**28.250**	
EARN	**0.089**	0.000	**0.058**	**0.125**	**0.133**	**0.183**	3.157
	64.953	0.167	**24.994**	**19.828**	**1,321.021**	**31.210**	
Accruals							
ΔWCAP	**0.045**	-0.005	**0.024**	**0.030**	**0.010**	**0.054**	2.285
	22.001	-1.341	**6.755**	**3.192**	**83.783**	**6.100**	
ΔWCAP components:							
- of which *ΔDebtors*	**0.056**	-0.003	**0.033**	**0.039**	**0.015**	**0.073**	2.186
	26.346	-0.949	**9.182**	**4.007**	**133.388**	**7.940**	
- of which *ΔStock*	**0.048**	**-0.007**	**0.031**	0.002	**0.010**	**0.033**	1.081
	23.411	**-2.135**	**8.826**	0.263	**89.825**	**3.770**	
-of which *ΔCreditors*	**-0.059**	0.006	**-0.040**	-0.012	**0.012**	**-0.052**	1.286
	-23.749	1.467	**-9.591**	-1.011	**103.091**	**-4.880**	
DEP	**-0.072**	-0.003	**-0.024**	0.005	**0.017**	**-0.019**	0.812
	-79.433	-1.788	**-15.553**	1.078	**145.359**	**-4.990**	
SPEC	**-0.005**	0.003	**-0.009**	**0.054**	**0.008**	**0.045**	-4.973
	-5.941	1.888	**-5.991**	**13.164**	**65.845**	**11.790**	

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=\{1 \text{ if } RET_t\leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. The total number of observations in the sample is 25,888. All coefficients' estimates and R^2s are pooled cross-sectional time series for the period 1969-2001 and associated t-statistics are White's (1980). Boldfaced estimates are significant at 5% or better $|t|>1.960$.

approach in this study are likely smaller as they would otherwise be due to the sample composition that includes non-December fiscal-year ends and a degree of overlap results. Accordingly, the differences between Table 5-7 and the basic Table 4-8 above are likely smaller than they would otherwise be.

Overall, the results agree with the results from cross-sectional regressions. There is no asymmetry in operating cash flows (*OCF*), the asymmetric timeliness measured by the estimated incremental coefficient $\hat{\gamma}_1$ is increasing from *OP* to *EARN* and most asymmetry is reflected in working capital accruals, in particular in the *ΔDebtors* component, and in special items (*SPEC*). To a degree, the results presented here are surprising, given that they appear to be weaker than the cross-sectional results. For example, the *t*-statistics on *ΔWCAP* is weaker in the pooled than in the cross-sectional regressions. However, the conclusions are unaffected by the choice of this estimation method.

5.7.2 LSDV method - incorporating the effects of time

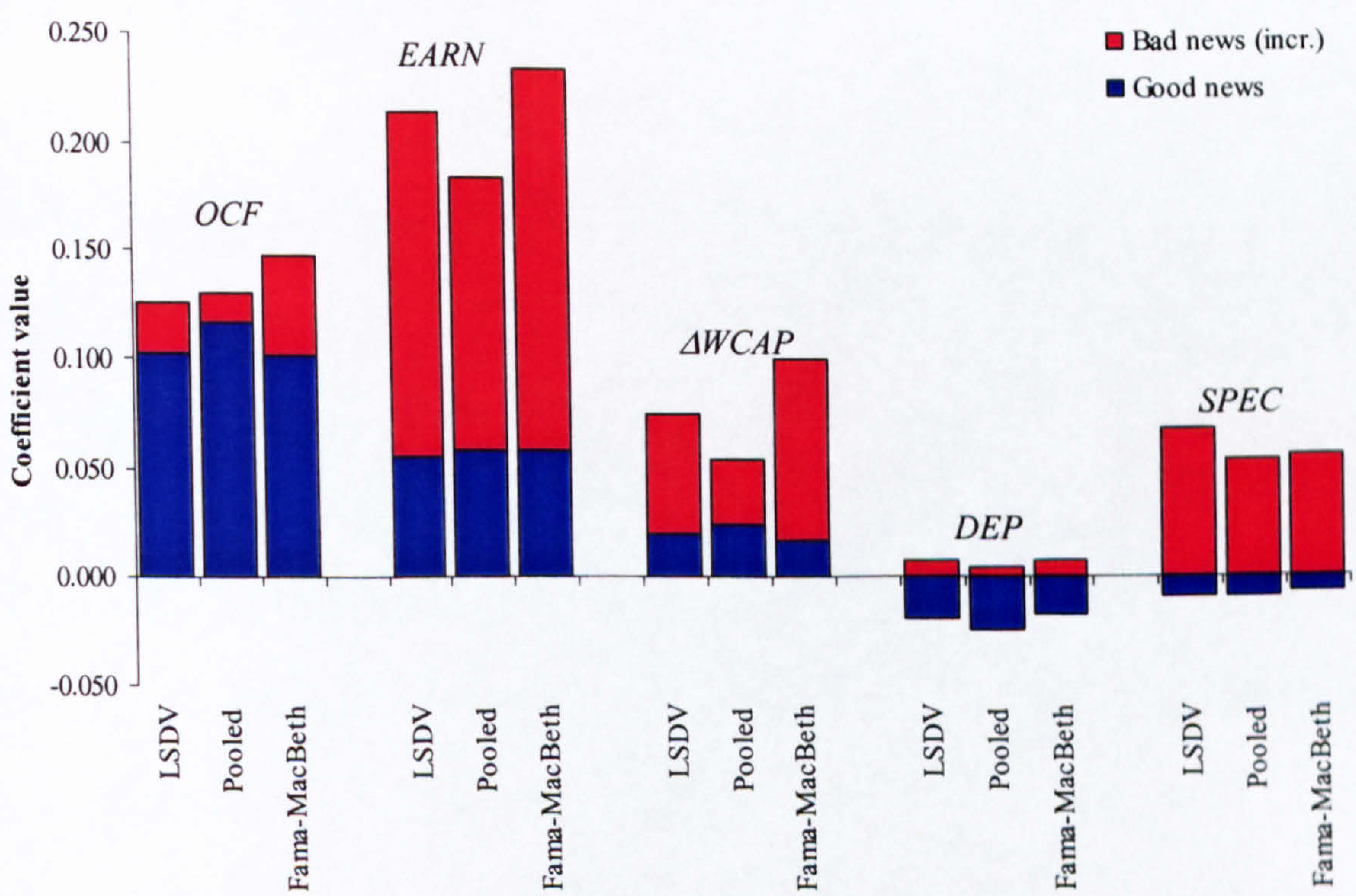
Another possibility is to estimate a pooled cross-section time-series with yearly non-interactive dummy variables (Gujarati, 2003, 642-647; Greene, 2000, pp. 560-566; Johnston and DiNardo, 1997, pp. 389-411): the least squares dummy variable – LSDV method whereby the original contemporaneous model of accounting conservatism is expanded by the introduction of yearly additive dummy variables. These relax the second part of the assumption that the regression constant is fixed both across cross-sectional units and in time. In the case of the contemporaneous model, the regression equation is:

$$\frac{X_t}{P_{t-1}} = \alpha_0 + \alpha_1 D_t + \beta_1 RET_t + \gamma_1 D_t RET_t + \sum_{\tau=1970}^{2001} \zeta_\tau T_\tau + \varepsilon_t \qquad (5\text{-}8)$$

where, in addition to variables already defined earlier in this study, there are τ= 33–1= 32 dummy variables T_τ taking the value of one if a firm's accounting year-end is in year τ. Compared to the basic formulation of the contemporaneous model in equation (3-10) in section 3.3, the latter can be viewed as a restricted version of the former, the restriction being the assumption that the regression constant is equal for all firms and all time periods (the regression constant reflects both the cost of capital and the V_t-term). Note that equation (5-8) is estimated for all the main earnings and earnings components variables and, accordingly, the following exposition applies to all the different regressions using all the different accounting variables X_t.

Figure 5-2 compares the good news coefficients and the incremental bad news coefficient estimated using the unrestricted (LSDV) method and the two other methods used previously (pooled and Fama and MacBeth, 1973) for the main accounting variables. The main overall conclusion is that the results shown in the main body of this research are robust to estimation method: all three yield very similar $\hat{\gamma}_1$ and $\hat{\beta}_1$ coefficients and significance levels. Specifically, using either method, the results indicate there is no asymmetry in reflecting bad economic news in operating cash flows, the asymmetry of earnings is high and most of this asymmetry is reflected in working capital (*ΔWCAP*) and special items (*SPEC*) accruals. The results for variables that are omitted from Figure 5-2 are qualitatively very similar to both pooled results and cross-sectional averages. Therefore, the main conclusions regarding accounting conservatism presented in the main body of the research are not sensitive to method of estimation.

Figure 5-2: A comparison of the LSDV, pooled and Fama-MacBeth (1973) methods on the contemporaneous model of conservatism, 1969-2001



Notes to Figure 5-2. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1} RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=\{1$ if $RET_{t,t-1}\leq 0$; 0 otherwise$\}$. All variables are deflated by opening share price P_{t-1}. "LSDV" is estimation using yearly dummies, "Pooled" indicates pooled regressions and "Fama-MacBeth" indicates coefficients calculated as cross-sectional averages according to Fama and MacBeth (1973) method.

Formally, the differences between the pooled estimation and the LSDV estimation with time effects can be tested using the *F*-test – the restricted least squares (Gujarati, 2003, pp. 266-273, 640-644). The restrictions in the pooled (i.e., restricted) version are that ζ_{1970} to ζ_{2001} are equal to 0.

The test hypothesis stated in alternative form is:

H^A: *At least one of the coefficients* ζ_{1970} *to* ζ_{2001} *is different from zero.*

The test statistic is:

$$F_{m,n-k} = \frac{(R^2_{UR} - R^2_R)/m}{(1 - R^2_{UR})/(n-k)} \tag{5-9}$$

where R^2_{UR} denotes the R^2 from the LSDV (i.e., unrestricted) model and R^2_R denotes the R^2 from the pooled (i.e., restricted) regression, m is the degrees of freedom in the restricted model and equals to the number of linear restrictions imposed on the pooled versions or, equivalently, the number of independent (dummy) variables omitted from the restricted version relative to the unrestricted model, and $(n-k)$ is the number of degrees of freedom in the unrestricted version, n is the number of observations and k is the number of independent variables.

Table 5-8 shows the results of formal tests of differences between the unrestricted (LSDV) estimates and restricted (pooled) estimates of the contemporaneous model of accounting conservatism by earnings and earnings components. For all ten main variables, the $R^2_{UR} > R^2_R$ and the differences are statistically significant in all ten cases as indicated by high values of the test statistic F. Also, the number of times individual year-dummies are statistically different from zero is approximately two thirds and does not fall below twenty. It can be concluded from these tests that time effects regarding the regression constant are significant through time.

Table 5-8: Pooled versus LSDV estimates of the contemporaneous model – formal tests of differences, 1968-2001

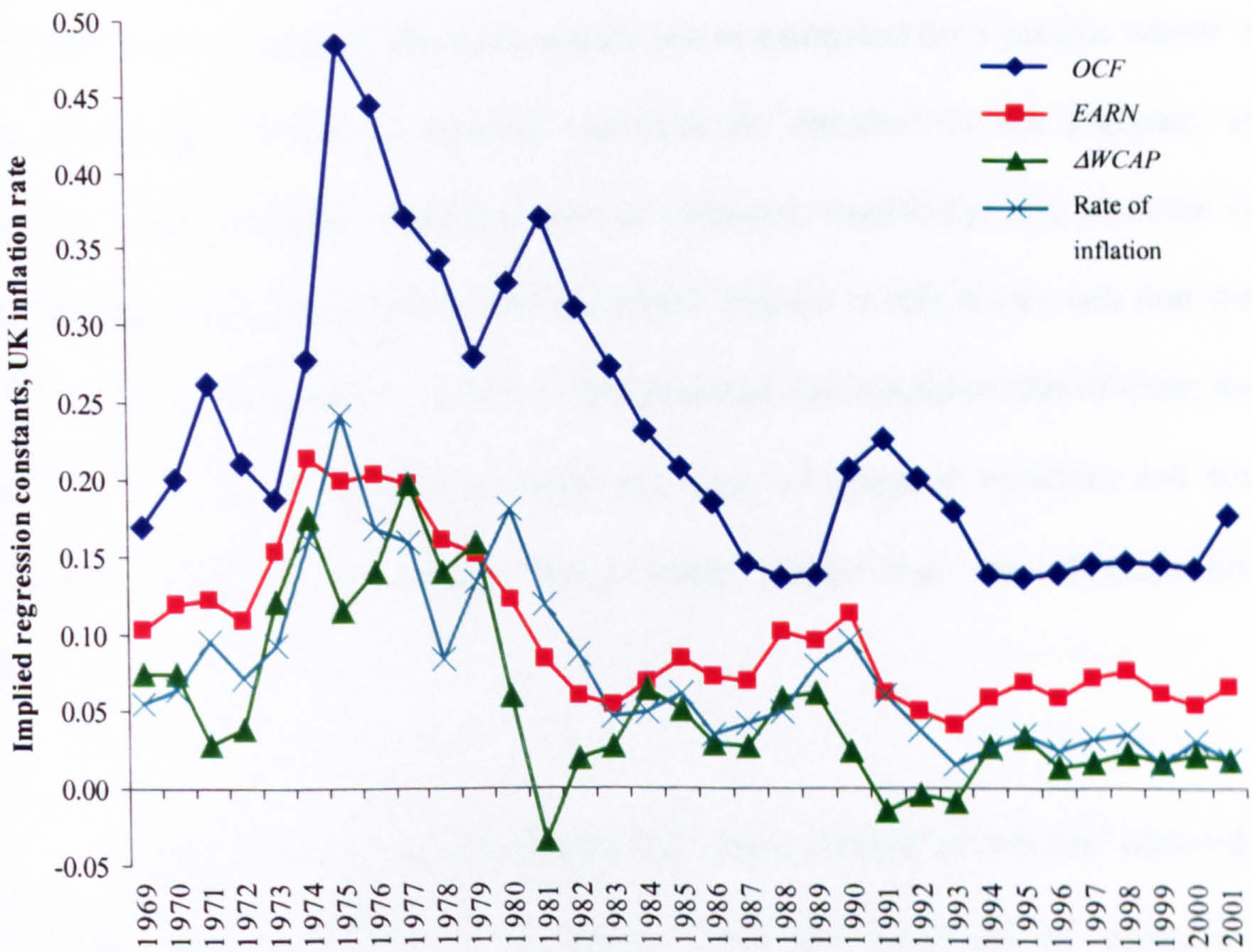
Dependent variable	R^2_{UR} (time dummies)	R^2_{R} (pooled)	No. of significant $\hat{\zeta}_\tau$	*F*-statistic
OCF	0.181	0.051	22	128.059
OP	0.424	0.110	27	439.401
ORD	0.326	0.151	28	209.848
EARN	0.273	0.133	28	155.766
ΔWCAP	0.103	0.010	27	84.049
ΔDebtors	0.075	0.015	27	52.478
ΔStock	0.128	0.010	26	109.520
ΔCreditors	0.071	0.012	22	51.163
DEP	0.116	0.017	20	91.179
SPEC	0.051	0.008	23	36.993

Notes. Estimated unrestricted models are: $X_t/P_{t-1} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \zeta_{1970} T_i + \ldots + \zeta_{2001} T_i + \varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=\{1 \text{ if } RET_{t,t-1} \leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. Restricted models are estimated without the ζ_{1970} to ζ_{2001} terms. The test statistic is evaluated at $F_{(33-1=32;\ 25,888-35=25,853)}$ degrees of freedom, the statistic is significant at the 1% level for all ten accounting variables X_t.

This conclusion is potentially particularly important within the context of this study in that the estimated regression constant $\hat{\alpha}_1$ contains both the term resulting from the effects of past economic news and applications of conservative accounting V_t/p_{t-1} as well as an estimate of the cost of capital $(1/k)$. The movements of the regression constant through time are presented in Figure 5-3 below plotted against the rate of inflation in the same period.

With the base year in 1969 and yearly dummies T_{1970} to T_{2001}, the conclusions presented above remain therefore essentially unchanged. It is acknowledged the possibility that interacting yearly dummies with $RET_{t,t-1}$ and $D_{t,t-1} \cdot RET_{t,t-1}$ might affect the results. However, introducing independent variables that interact with yearly dummies may introduce other problems in estimation and interpretation of the results (Greene, 2000, p. 560, footnote 5), apart from reducing the degrees of freedom.

Figure 5-3: Regression constants from the unrestricted model and the UK rate of inflation, 1969-2001



Notes to Figure 5-3: *OCF*, *EARN* and *ΔWCAP* denote the regression constant from the LSDV model plus yearly dummies for each year 1969-2001.

5.7.3 The effect of the method of outliers' removal

Given that there are several possibilities to remove outliers from the sample and little empirical guidance towards the appropriate procedure to remove outliers in this type of research exists, this section presents the effects of the method of outliers' removal from the sample. First, observations are excluded from the sample if the values of deflated, per share accounting variables *OCF*, *OP*, *ORD*, *EARN*, *ΔWCAP*, *DEP*, *SPEC* and market variable $RET_{t,t-1}$ are outside the ±3 standard deviations from the respective individual variables means calculated on a pooled basis, rather than the top/bottom one percentile on these variables. In order to enter the sample, an observation's main variables must all simultaneously lay within the ±3 standard deviations interval. Second, the main results are re-estimated on a sample where the only requirement is that all required variables are reported by the company and available in the database – outliers are not removed. Implicitly, this assumes that extreme values are descriptive of the processes studied in this thesis and that these extreme values are not due to errors in the database and manipulation of these data. Rees (1996, p. 94-95) discusses briefly the issue of negative numbers and small divisors in particular, a problem that possibly results from the aforementioned factors.

The first effect of the ±3 standard deviations method of outliers' removal on results presented in Table 5-9 compared with the basic set of estimates of contemporaneous models presented in Table 4-8, is the higher average number of observations. Therefore, fewer observations are eliminated, on average, using this method of outliers' removal than using the top/bottom 1 percentile method employed in the main body of this study. This implies a sample with more extreme observations. Given that in order to be entered in the sample all observations must simultaneously have all main variables within the respective ±3 standard deviations, the average number of observations does not change across the dependent variables.

Second, a more extreme sample is likely to reduce the average explanatory power of models due to greater variability of the dependent variable. *Ceteris paribus*, this implies a reduction in the R^2 of any regression. Economically, more extreme observations are consistent with more transitory items present in each of the main variables. Overall, the results presented are in accordance with expectations. Also, in a simple bivariate regression context, there are no *a priori* grounds that would suggest the relation between earnings or earnings components and returns is any different for extreme observations. The results show that at least for *OCF* and the earnings variables most coefficients in fact increase (which per se would imply an increase in R^2s), reinforcing thus the validity of the *ceteris paribus* assumption.

Third, the relations among the magnitude of the coefficients on different measures of earnings are preserved. The response to good news is strongest for operating profit *OP*, followed by *EARN* and by *ORD*. These coefficients also do not differ materially from those presented in Table 4-8. The asymmetric response to bad news follows a similar pattern, as well as the R^2s, the total response to bad news and the relative response to bad news.

Fourth, regarding the results for accruals, $\Delta WCAP$ and its components overall are that the response to good and bad news increases marginally. Perhaps the single most important result is that the estimated coefficient on good news in the *SPEC* regression $\hat{\beta}_1$ becomes statistically insignificant, while still being negative – a sign that would be consistent with earnings management to decrease earnings if the returns are positive. Also, the incremental bad news coefficient in this specification is higher than the corresponding coefficient in the basic contemporaneous results.

Table 5-9: Contemporaneous Pope and Walker (1999) models of ex-post accounting conservatism, 1969-2001, observations within ±3 standard deviations from individual means only

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Operating cash flows								
OCF	819.8	**0.228**	-0.003	**0.089**	0.057	**0.046**	0.146	1.637
		15.301	-0.491	**6.514**	1.762	**7.216**		
Earnings								
OP	819.8	**0.208**	-0.003	**0.101**	**0.152**	**0.163**	0.253	2.510
		10.880	-0.580	**7.646**	**6.749**	**14.637**		
ORD	819.8	**0.098**	0.000	**0.057**	**0.135**	**0.187**	0.193	3.374
		14.311	0.137	**8.888**	**10.467**	**16.145**		
EARN	819.8	**0.095**	0.003	**0.059**	**0.193**	**0.162**	0.252	4.256
		13.036	0.715	**9.825**	**10.723**	**17.729**		
Accruals								
ΔWCAP	819.8	**0.052**	0.001	**0.028**	**0.087**	**0.017**	0.115	4.129
		5.034	0.350	**3.289**	**3.430**	**9.381**		
ΔWCAP components:								
- of which *ΔDebtors*	819.8	**0.059**	0.002	**0.045**	**0.064**	**0.025**	0.109	2.411
		7.071	0.408	**6.234**	**2.382**	**10.458**		
- of which *ΔStock*	819.8	**0.055**	0.001	**0.039**	**0.064**	**0.023**	0.103	2.641
		4.846	0.142	**5.051**	**2.509**	**8.901**		
-of which *ΔCreditors*	819.8	**-0.061**	-0.001	**-0.057**	-0.041	**0.023**	-0.097	1.722
		-6.828	-0.291	**-7.963**	-1.619	**9.535**		
DEP	819.8	**-0.075**	-0.001	**-0.017**	0.007	**0.022**	-0.010	0.584
		-17.675	-0.584	**-5.144**	0.948	**5.930**		
SPEC	819.8	-0.003	0.002	-0.005	**0.059**	**0.024**	0.054	-10.255
		-1.252	1.282	-1.398	**6.414**	**6.653**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{i,t-1}+\beta_1 RET_{i,t-1}+\gamma_1 D_{i,t-1}RET_{i,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{i,t-1}=(P_t-P_{t-1})/P_{t-1}$ and $D_{i,t-1}=\{1 \text{ if } RET_{i,t-1}\leq 0; 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$.

Overall, the effect of changing the outliers' removal procedures does not affect the inferences in statistically and economically important ways. Without (over-)stressing the result, it must be noted that the coefficient on good news in the *SPEC* regression that becomes statistically insignificantly different from zero, thus at least statistically affecting the conclusion that good news result on average in a slight decrease in earnings (specifically, earnings after extraordinary and exceptional items *EARN*). However, the sign and magnitude of the $\hat{\gamma}_1$ coefficient in this regression remain.

Omitting completely the controls of outliers represents a further step in sensitivity analyses. The main results are presented below in Table 4-1, but a complete set of results including additional variables as well as the lagged version of the models is presented in Appendix C, Table C-1 and C-2. The single most interesting result that emerges from this sensitivity analysis is due to working capital accruals. Both the coefficient on good news and the incremental coefficient on bad news become statistically insignificantly different from zero, as opposed to findings in the basic set of results that indicates an important role of this type of accruals in reflecting bad economic news. Moreover, the R^2 in the $\Delta WCAP$ regression does not change from the basic results. The role of the component $\Delta Stock$ now appears to be much more important in reflecting bad news. Consistent with the change in significance of the asymmetric response of $\Delta WCAP$ to bad news is the fact that the asymmetric response of special items (*SPEC*) to bad news now appears to be economically much stronger, on average – the estimated incremental coefficient $\hat{\gamma}_1$ more than doubles from 0.056 to 0.118, but also more variable – the Fama-MacBeth (1973) t-statistic decreases from 6.957 to 5.208. Also, the incremental sensitivity of the depreciation expense *DEP* becomes statistically significant (albeit just). There are no obvious explanations of this result.

Overall, the effects of controls for outliers employed do not appear to materially affect the results presented in this thesis, including omitting these controls

Table 5-10: Contemporaneous Pope and Walker (1999) models of ex-post accounting conservatism, 1969-2001, outliers not removed

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Operating cash flows								
OCF	860.1	**0.263**	0.016	**0.103**	0.163	**0.045**	0.266	2.593
		12.714	0.442	**4.901**	1.503	**5.693**		
Earnings								
OP	863.8	**0.238**	**-0.018**	**0.098**	**0.208**	**0.089**	0.306	3.112
		10.516	**-2.314**	**5.248**	**7.934**	**9.497**		
ORD	863.8	**0.112**	-0.008	**0.046**	**0.208**	**0.086**	0.254	5.463
		13.695	-1.449	**5.288**	**8.718**	**11.111**		
EARN	863.8	**0.106**	-0.001	**0.052**	**0.321**	**0.069**	0.373	7.181
		11.541	-0.158	**5.195**	**8.215**	**13.327**		
Accruals								
ΔWCAP	861.1	**0.057**	-0.035	0.022	0.014	**0.023**	0.037	1.650
		5.052	-1.005	1.750	0.150	**4.279**		
ΔWCAP components:								
- of which *ΔDebtors*	861.1	**0.070**	-0.042	**0.045**	-0.031	**0.030**	0.014	0.301
		6.911	-1.087	**4.137**	-0.300	**3.959**		
- of which *ΔStock*	861.2	**0.056**	0.002	**0.041**	**0.086**	**0.021**	0.127	3.106
		4.787	0.233	**2.871**	**3.028**	**5.034**		
-of which *ΔCreditors*	861.2	**-0.068**	0.005	**-0.064**	-0.040	**0.030**	-0.104	1.629
		-6.368	0.453	**-4.655**	-1.713	**5.629**		
DEP	860.9	**-0.085**	0.001	**-0.028**	**0.028**	**0.029**	0.000	-0.016
		-14.556	0.282	**-5.663**	**3.079**	**5.258**		
SPEC	859.4	-0.006	0.007	-0.002	**0.118**	**0.017**	0.116	-56.171
		-1.609	1.820	-0.405	**5.208**	**6.808**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{t,t-1}$ = {1 if $RET_{t,t-1} \leq 0$; 0 otherwise}. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1 = 32 d.f., i.e., $|t|>2.0369$.

altogether. Other methods might have been employed. An overview of some of these alternative methods is presented for example in Dillon and Goldstein (1984, p. 252-270). However, on the basis of the results presented in this section, it is concluded that these would not materially affect any inferences.

5.8 THE EFFECT OF PUBLISHED OPERATING CASH FLOW AND BOTTOM-LINE EARNINGS FIGURES

The sample used in this study covers one of the longest (if not the longest) time-series of UK accounting data to date. The content of particular data items thus covers different periods in terms of regulatory regimes that have governed the creation of these figures. While there are many issues that may be of interest regarding the changes in regulatory regimes and their influence on the accounting numbers, at least one such change is important in terms of the results obtained in this research – the introduction of the FRS 1 – *Cash flow statements* in September 1991 and subsequently revised in 1996 (valid for financial years ending on or after 23rd March, 1997). FRS 1 superseded the previous *SSAP* 10 – *Statements of source and application of funds* issued in July 1975 (e.g., Lewis and Pendrill, 1996, pp. 315-318).[95] The "net cash flow from operating activities" figure is generally available for financial years ending in 1992 or later (828 firms out of a total 848 in the contemporaneous sample in 1992 report this figure), although some firms apparently adopted the standard earlier or have published comparable figures for previous years according to this standard. While Table 4-9 shows that the association between the operating cash flow figure and good economic news is slightly declining and that there is no discernible time trend in terms of asymmetric sensitivity to bad news, the question regarding any possible effects of using the published cash flow figure as opposed to the estimated figure remains. The question is particularly important given that since Basu's (1997, p. 17, Table 2) influential paper, a number of papers have

[95] A historic perspective of funds-statements developments up to late 1960s can be found in Rosen and DeCoster (1969). They state that the Assam Company in England prepared a funds-like statemet already for the financial year ending on March 31st, 1862. Collins (1946) also provides illustrations of various early funds statements.

consistently reported a rather puzzling result that is not consistent with accounting conservatism being an accruals phenomenon – the asymmetric timeliness of operating cash flows to bad news for the US sample (e.g., Ball, Kothari and Robin, 2000, pp. 36-37, Table 6, and Garrod, Pope and Valentincic, 2004; both for respective US samples).

The questions regarding the comparability of published and constructed figures can also be studied in the case of the earnings figure. The constructed "bottom-line" earnings number in this research is earnings after extraordinary and exceptional items (*EARN*). The issues surrounding the construction of a "bottom-line" earnings figure that would be comparable through such a long time period has been described in section 4.2 (in particular, see Figure 4-1). DataStream provides a bottom-line earnings figure for financial years ending in 1987 or after (DataStream item #625 – Earned for ordinary), presumably to reflect the introduction of SSAP 6 (Revised) in 1986. Davies, Paterson and Wilson (1999, pp. 1481-1484) provide a summary of historical developments of the FRS 3 and its precedents.

The analysis for both figures is performed in the following steps. In both cases, the samples used are a sub-set of the basic contemporaneous sample with both the estimated and published figures available. This is to ensure that the samples are comparable in terms of descriptives. The procedure produces the following two sub-samples. For the operating cash flow figure, the sample includes 9,352 firm-years with both the estimated and published figures available with year-ends in the period 1992-2001. The descriptives of the published versus estimated figures sub-sample are comparable, although the range of the deflated published figures is slightly wider

(–0.504 to 1.578) than the range of the estimated figures sub-sample (–0.380 to 1.6867). The correlation coefficient for pooled observations in this sub-sample is very high, 0.963. For the "bottom-line" earnings, the sample includes 14,112 firm-years with year-ends in the period 1987-2001. The descriptives of the published versus estimated figures are very similar, although the range of published figures is slightly wider (–0.740 to 0.673) than the range of estimated figures sub-sample (–0.740 to 0.704).[96] The correlation coefficient for the pooled observations in this sub-sample is very high, 0.955.

Table 5-11 shows the results of contemporaneous models of accounting conservatism for the two figures where a published alternative is available. To maintain comparability, the Fama and MacBeth (1973) method is used, although a

Table 5-11: Estimated versus published operating cash flow figures (1992-2001) and estimated versus published "bottom-line" earnings (1987-2001)

Dependent variable	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Operating cash flows								
Estimated (*OCF*)	935.2	**0.164**	0.005	**0.061**	0.072	**0.071**	0.133	2.171
		24.874	0.676	2.597	1.772	4.452		
Published	935.2	**0.159**	0.006	**0.059**	**0.112**	**0.082**	0.170	2.892
		27.182	0.719	2.629	3.586	5.217		
"Bottom/line" earnings								
Estimated (*EARN*)	940.8	**0.073**	0.002	**0.034**	**0.192**	**0.162**	0.226	6.701
		16.102	0.648	5.544	14.709	9.752		
Published	940.8	**0.075**	0.003	**0.035**	**0.182**	**0.170**	0.217	6.216
		16.629	0.831	5.623	14.871	10.329		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1}RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable: *OCF* is operating cash flow and *EARN* is earnings after extraordinary and exceptional items, both as defined in section 4.2. The published figures are taken directly from Datastream: published operating cash flows – data item #1015 and published "bottom-line" earnings – data item #625. $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{t,t-1} = \{1 \text{ if } RET_{t,t-1} \leq 0;\ 0 \text{ otherwise}\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1992-2001 (operating cash flow) and 1987-2001 (earnings). Associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 10-1 = 9 d.f., i.e., $|t|>2.2622$ and at 15-1 = 14 d.f., i.e., $|t|>2.1448$.

[96] The minimums of both estimated and published deflated "bottom-line" earnings figures coincide exactly at –0.7403315.

degree of caution must be exercised in interpreting the results given that the inferences are made on just 9 and 14 degrees of freedom for operating cash flows and earnings figures respectively.

Turning first to the earnings figure, the results show a delayed response of both estimated and published figure to good economic news. Both $\hat{\gamma}_1$ coefficients are very similar in magnitude and significance. Both earnings figures exhibit significant asymmetric timeliness to bad economic news, measured by the incremental, the total or the relative total bad news coefficients. These results are thus very similar to the basic set of results presented in section 4.5.

In the case of operating cash flows, however, the results obtained by using the published figure differ qualitatively from those using the estimated figure. While both figures exhibit a delayed response to good news, the published figure also exhibits statistically significant asymmetric timeliness to bad economic news measured by the incremental bad news coefficient and emphasized by the magnitude of the total and relative total bad news coefficients. This result is not consistent with accounting conservatism being an accruals phenomenon. Further, Ball, Kothari and Robin (2000) do not report asymmetric timeliness of operating cash flows in respect to bad news for their UK sample, although a direct comparison of the result is difficult given that they use a cash flow figure constructed from data from a different database rather than take the published figures (as is the case in this thesis, too). Additional analyses (not reported) also reveal that the asymmetry in operating cash flows cannot be ascribed to either tax or net interest charges, as these adjustments do not affect the results qualitatively and affect them quantitatively only marginally.

To sum up, the results obtained elsewhere in this work regarding the effects of conservatism on the earnings figure are not sensitive to whether the published or the estimated figure is used. However, the results obtained for the operating cash flows change significantly if the published figure is used rather than the estimated figure within the same time period and for the same firms. Published operating cash flows exhibit a statistically significant asymmetric response to bad news. This result is not consistent with accounting conservatism. A comprehensive explanation as to why this occurs is left for future research.

5.9 SUMMARY OF FINDINGS FROM SENSITIVITY ANALYSES

Overall, the results of various sensitivity analyses show that the main results obtained in Chapter 4, are generally robust both in terms of differing firm attributes and in terms of methods used to estimate the models. While there are some (minor) differences in terms of firms of different sizes, industries and different accounting year-ends in responding to good and bad economic news, these differences do not affect qualitatively the conclusions from the main analyses.

Various adjustments to reflect varying general economic conditions across the sample period also do not affect the main results qualitatively and affect them quantitatively only very marginally. A similar conclusion applies to the choices of estimation methods and sample selection procedures, too. The construction of alternative proxies of ex-ante conservatism shows some deviations from expectations. However, because this area is empirically relatively under-researched, this is viewed as an indication of the need for further research rather. Another potentially important exception to expectations is the difference between the constructed and published cash flow figures in the post-FRS 3 period.

Generally, however, a delayed response to good economic news and an asymmetric response to bad economic news can be observed in all groups of firms in earnings figures. This asymmetric timeliness of earnings results from the accruals component (more specifically, the working capital accruals and special items, while deprecation does not have an important role in this asymmetry). The operating cash flow component does not, generally, reflect the arrival of economic news asymmetrically. The sensitivity analyses thus suggest that the results obtained in the main analyses are robust.

6 CONCLUSIONS

Background and principal findings. This study builds from and extends the existing literature on accounting conservatism, one of the dominant explanations of observed differences between market values and accounting performance measures, on a large sample of publicly-quoted UK companies operating in the United Kingdom at any point in the 1969-2001 period. The study provides additional, more detailed and new empirical evidence on different aspects of accounting conservatism. First, the persistence properties of accounting figures are shown (e.g., Giner and Rees, 2001). Second, direct tests of conservatism as reflected in accounting earnings, cash flows and, in particular, accruals (Pope and Walker, 1999; Basu, 1997) are presented, including changing time-series properties of accounting numbers due to conservatism (e.g., Ryan and Zarowin, 2003; Givoly and Hayn, 2000; Francis and Schipper, 1999) and the effects of previous periods news and of previous accounting practices (Pope and Walker, 1999; Giner and Rees, 2001). Third, influence of the sign of "bottom-line" earnings (e.g., Berger, Ofek and Swary, 1996; Hayn, 1995) is studied, both directly by expanding the Pope and Walker (1999) model and indirectly through separate estimation of the basic model by the sign of earnings or various earnings components. Fourth, the effects of general (Pope and Walker, 2003) and asset-specific recognition rules are studied. Finally, in the sensitivity analyses, other controls, some of them sample-specific (e.g., adjustments for general economic conditions) and the effects of other characteristics (e.g., firm size, fiscal year-end) are studied. The main findings are the following.

First, the study provides evidence on mean-reversion and/or persistence properties of earnings, cash flows and accruals induced by accounting conservatism. From a time-series perspective, a performance measure reflecting the realised proportion of good economic news will tend to be persistent. On the other hand, accounting conservatism requires immediate and complete recognition of economic losses (decreases in market value). This will be reflected in financial statements as a large, one-time earnings-decreasing change in an accounting figure. This study shows explicitly which accounting figures reflect/are affected by accounting conservatism and in what precise way to the level of detail allowed by the data. To allow a detailed exposition, accounting earnings are decomposed in its two main components: operating cash flows and accruals. The latter is further subdivided into three distinct categories: working capital accruals (and its three main components – changes in debtors, stock and creditors), depreciation and amortisation charge, and "special items".

Operating cash flows do not contain any accruals. It is only expected to reflect the realisation of operations. In doing so, the operating cash flows are expected and found to be strongly, albeit not completely (Dechow, Kothari and Watts, 1998), mean-reverting – periods of high cash outflows (e.g., to buy stock of raw material) are followed by periods of high cash inflows (e.g., as sales are collected). There is no difference between earnings-increasing and earnings-decreasing changes in the operating cash flows. The inclusion of the consequences of financing and investment activities in the cash flows measure yields similar results. Moreover, given that cash flows only reflect the economic reality of the firm, there is no difference between profit and loss firms and firms that exhibit decreases in share prices.

Accounting earnings, a performance measure that includes accruals, on the other hand, exhibits different time-series properties. The partial realisation of an economic gain implies an earnings increase. This increase will be followed in the next period by another earnings increase as a consequence of a similar partial realisation of an original economic gain. Therefore, earnings increases are predicted and found to be persistent. On the other hand, economic losses under conservative accounting cause large, complete one-time adjustments to assets recorded in the balance sheet. This implies that a corresponding earnings decrease will appear only once in the profit and loss account. In other words, earnings decreases are fully transitory (mean-reverting). The more accruals components a particular measure of earnings includes, the more mean-reverting are the earnings decreases.

Given that earnings is a simple sum of operating cash flows and accruals components and, as theory indicates and evidence shows, the cash flows are not the component affected by accounting conservatism, the observed asymmetric persistence of earnings must be clearly reflected in various accruals components. This study hypothesises and finds that working capital accruals and its three main components are on average strongly mean-reverting, as is expected, given that the operating accruals are intended to counteract the negative serial correlation in operating cash flow to arrive at a more smooth performance measure (earnings). However, the results show that earnings-decreasing changes in working capital accruals reverse about 50% faster than earnings-increasing changes in working capital accruals, a result consistent with accounting conservatism. Another (or perhaps the principal) accruals component that is expected to reverse fast if it reflects an economic loss under conservative accounting, is the "special items", a collection of various extraordinary, exceptional and other similar items. The results confirm this expectation. Moreover, both working capital accruals and special items mean-revert more if a firm exhibits a "bottom-line" accounting loss and/or it exhibits bad economic news. Interestingly, the mean-reversion rates in both working capital accruals and special items are very similar, even though existing literature typically explores in more detail the effects of special items on persistence of earnings. On the other hand, the depreciation and amortisation charge is typically not associated with accounting conservatism. The results show that both increases (i.e., earnings-decreasing changes) and decreases (i.e., earnings-increasing change) in the deprecation charge are permanent.

Second, the study extends Pope and Walker (1999) empirical results by providing tests of ex-post accounting conservatism using their model. The model is built around the asymmetric-timeliness property of earnings that results under conservative accounting. Good economic news is reflected in earnings only partially, as it meets the criteria of recognition, resulting in relatively low timeliness of earnings. Bad economic news, on the other hand, must be recognised in earnings immediately, resulting in strong timeliness of earnings. Given that this study uses various earnings figures that differ chiefly in the amounts and types of accruals components included in them and given that the operating cash flow component is also constructed, comparing the differential asymmetric timeliness between the cash flow and various earnings models allows indirect inferences about the role of accruals in the observed asymmetric timeliness of earnings. In a general confirmation of existing (US) empirical evidence, operating cash flows generally exhibit low timeliness and, given that they contain no accruals, exhibit no asymmetric timeliness in reflecting bad news. Earnings, on the other hand, show increasingly more asymmetry in reflecting bad news as more and more accruals are added from operating profit to ordinary earnings to earnings after extraordinary and exceptional items. While these are ascribed to the effect of accruals neither Basu (1997) nor any other existing similar study provides direct evidence on the asymmetric timeliness property of various types of accruals.

This study provides direct tests of the different roles various types of accruals have in the observed asymmetric timeliness of earnings. Of the total asymmetric timeliness observed in earnings, an important part results from the asymmetric timeliness of working capital accruals. Moreover, the results show that all of its three individual components reflect bad news asymmetrically. Special items are the other important type of accruals that reflects bad news asymmetrically. The depreciation charge, on the other hand, does not have an important role in the observed asymmetric timeliness of earnings. This analysis also produces an interesting "side" result – good news results in a small, but statistically significant earnings-decreasing change in special items, a result consistent with earnings smoothing. Thus the results of this analysis also impinge upon other areas of capital market-based accounting research. Accruals results show that even though accruals is the component that makes cash flows more timely in reflecting economic news, the criterion by which the overall timeliness is judged – the R^2 – is very low in the accruals regressions. A simplified explanation is provided that this is in fact to be expected if accruals have the role in making cash flows timely to arrive at a timely accounting performance measure – the accounting earnings.

Regarding the changes in conservatism through time, this study finds some evidence that conservatism is in fact increasing in the UK as well, but the evidence is much less persuasive than the US evidence (e.g., Givoly and Hayn, 2000). The evidence, consistent with US results, shows that the sensitivity of earnings to good news has decreased from 1969 to 2001. The evidence on increasing conservatism can directly be inferred through slight increases over time in the incremental bad news coefficient either directly in earnings after extraordinary and exceptional items or in special items, or indirectly through relative skewness and variability of earnings measures, standardised by respective operating cash flow measures.

The lagged analysis provides corroborating evidence to the results from the contemporaneous models. Operating cash flows do not exhibit any asymmetric timeliness, the three earnings figures exhibit a pronounced contemporaneous asymmetry to bad news and ordinary earnings and earnings after extraordinary and exceptional items also exhibit decreasing asymmetry at lag one and lag two. This result is, theoretically, not entirely expected under conservative accounting, but has been shown in Pope and Walker (1999) up to and including lag one and is consistent with prices-lead-earnings phenomenon in the UK (Donnelly and Walker, 1995). The significance of lag two incremental bad news coefficient is, perhaps, due to the sample composition that includes varying accounting-period lengths. However, lag three asymmetry is statistically insignificantly different from zero. Direct lagged tests on accruals reveal, again, that contemporaneous asymmetric timeliness of earnings is due to both working capital accruals and special items, but that the two significant bad news lags are likely due to special items. This result thus suggests that some types of bad news are not recognised in earnings immediately, but its effect spread over up to three years. Of the working capital accruals, only the change in stock and work in process now exhibits asymmetric timeliness with the current and lag-one coefficients being significant.

The levels and sign of "bottom-line" earnings as well as other accounting variables may represent a control for previous periods' application of conservative accounting. It thus helps in modelling the V_t-term within the Pope and Walker (1999) model (Giner and Rees, 2001). However, it might also serve as a proxy for other, perhaps incremental, explanations of the differences between the accounting figures and market values (e.g., the existence of abandonment options "in the money" – e.g., Berger, Ofek and Swary, 1996). The results shown here are consistent with both these explanations in that the R^2s increase sharply, while the coefficients on good and bad economic news remain essentially unchanged relative to the basic set of results. These findings are valid if lagged levels of the dependent variables are included rather than levels of earnings after extraordinary and exceptional items.

Third, the analysis of earnings components by the sign of "bottom-line" earnings shows that the two groups of firms exhibit different average values of operating cash flows and accruals components and that the correlations between these variables are fundamentally different for the two groups of firms, as is suggested by existing literature (e.g., Lipe, Bryant and Widener, 1998; Collins, Pincus and Xie, 1997; Jan and Ou, 1995; Hayn, 1995). However, differences in terms of application of ex-post accounting conservatism are not expected. Direct tests of ex-post conservatism do, in fact, show no differences in reflecting good and bad news for the "bottom-line" profit and loss firms and neither does the developed absolute-value model. Moreover, separating the observations by the sign of the operating cash flow component reveals that in both groups earnings exhibit levels of asymmetric timeliness that is statistically indistinguishably different from one another. In contrast, separating observations by the sign of either working capital accruals, special items or total accruals, reliably shows that the asymmetric timeliness is statistically significantly higher in negative accruals groups, as expected under conservative accounting. Immediate, timely and complete recognition of bad news results in large, earnings-decreasing changes in accruals, possibly, but not necessarily leading to a "bottom-line" loss. In either case, the accruals components determines this asymmetric timeliness, rather than the operating cash flow (or, earnings itself).

Fourth, the ex-post application of accounting conservatism has been shown both theoretically and empirically (Pope and Walker, 2003) to be limited by the application of ex-ante conservatism. The higher the ex-ante conservatism, the less likely it is that earnings will reflect asymmetric timeliness in reflecting bad news (and timeliness in reflecting good news). As earlier, the component of earnings that should be affected by these rules, is the accruals component. As expected given previous results and the predictions of ex-ante literature, the asymmetric timeliness of earnings increases with decreasing application of ex-ante conservatism and is higher for earnings after extraordinary and exceptional items than for ordinary earnings (and, with some deviations, operating profit). This asymmetry across different levels of ex-ante conservatism is reflected most clearly through the working capital accruals and special items. Newly-developed asset-specific measures of "sources" of ex-ante conservatism reinforce these findings. Some individual components in some tertiles are of the correct signs and consistent magnitudes but statistically insignificant (albeit, not at entirely prohibitive levels to allow at least some comparative inferences). The results do, however, show one puzzling result – operating cash flows reveal a statistically and economically significant asymmetric response to bad news in the group of observations where it is least-likely to be observed (low book to market). This result is not expected under conservative accounting. However, this puzzle persists ever since the influential Basu (1997) paper.

Finally, a selection of other results and respective conclusions include the following. Smaller firms' earnings tend to exhibit higher asymmetric timeliness in incorporating bad news, nonetheless because their size precludes the risk-dispersion at the operating level (Basu, 2001). There is some preliminary evidence that extremely bad news firms tend to apply more conservative accounting, while very good news firms apply earnings-reducing accounting reflected via special items. On the one hand, this is consistent with "big bath" accounting, while on the other with earnings smoothing (Kirschenheiter and Melumad, 2002). Accounting conservatism appears to be a phenomenon that governs the relation between accounting numbers and financial statements regardless of the industry in which a firm operates, albeit these characteristics are reflected in industry book-to-market ratios that in turn proxy for varying levels of ex-ante conservatism. Various adjustments, including market-wide index returns, yields on short- and long-term government bonds, December 31st versus non-December fiscal year-ends, extremities and methods of inference, not only provide corroborating evidence for previous results, but in a majority of cases have the effect of moving the results more towards hypothesized results.

Some innovations and specificities of this study. While building on existing literature, this study expands it at least in the following important aspects (or groups of aspects). First, it employs a UK sample that is large both in cross-sectional and in time-series terms as it includes both live and dead companies and covers, to the best of my knowledge, the longest UK sample covering 1969-2001. Notwithstanding technical issues of constructing such a sample, its properties lead to several developments that are both necessary in such a context while at the same time being complementary to existing studies. These include: construction, indirect and direct tests of different earnings, operating cash flow and certain accruals figures that ensure the highest-possible level of comparability through time as well as internationally. Some of these measures are complemented by more detailed measures (e.g., operating cash flows are complemented with the "total cash flow" figure in appendices). These issues are particularly pressing given that the study requires relatively detailed accounting data that, furthermore, originates from periods with different levels and types of accounting regulation.

The second extension of existing literature that this study provides is related to issues of controls for various market-wide effects and controls for fiscal-year ends in an UK context, while at the same time ensuring maximum caution in inferences by using consistently the Fama and MacBeth (1973) method throughout the thesis, including persistence models. They also determine certain sub-divisions necessary to allow for ex-ante conservatism (e.g., the tertiles versus deciles issue).

Third, some particular innovations relating to methods used in this study include the aforementioned market-wide controls that are performed on an individual observation basis (i.e., firm plus time) in conditions of varying accounting-period lengths. An attempt to form an aggregate test of expected values of coefficients in persistence regressions estimated cross-sectionally is also made. New time-series measures are developed – in particular, some relative earnings and accruals skewness and variability measures standardised by respective statistics for the operating cash flow figures. A formal test between pairs of coefficients resulting from different partitions (e.g., profit versus loss firms) is applied to issues studied in capital market-based accounting research. To the extent that issues surrounding the measurement of levels of ex-ante conservatism, asset-specific measures are developed.

Fourth, in terms of modelling, the absolute-value model developed here incorporates directly (allows for) the effects of varying signs of the dependent variable ("bottom-line" earnings), albeit with some econometric difficulties.

Fifth, within the sensitivity analyses, comparative results are presented for published versus constructed figures used in this text. The issue is potentially important to investors, researchers, and standard-setters. Moreover, it provides some preliminary evidence on coexistence of "big bath" and earnings-smoothing accounting.

Weaknesses and suggestions for further research. Several weaknesses appear in this thesis. These issues represent in a great majority of cases potential areas of future research. Some of these areas include the following. First, the study includes only certain types of accounting performance measures as well as only some proxies for ex-ante conservatism. Both might be improved upon/expanded using the respective post-FRS figures. One such issue that might be related more to ex-post accounting conservatism are the financing and taxation accruals and cash flows (Garrod and Hadi, 1998), the effects of which could not be removed entirely from or study adequately in this study. Moreover, additional ex-ante conservatism measures might be introduced. Given such a long time-series, the "bias and lags" measure in Beaver and Ryan (2003) might be feasible. Other studies suggest one minus depreciation expense relative to the appropriate asset-base, R&D and advertising expenses relative to total assets (Ahmed, Morton and Schaeffer, 2000). A related issue conditioned by data availability is that neither Basu (1997) nor Pope and Walker (1999) include dividends in the calculation of returns. However, all these extensions are data-intensive so they will invariably involve the trade-off between the method of inference (determined by the time-series length) and richness of data (post-FRS figures).

Second, in terms of methods used, an econometric resolution to the sample-truncation bias and the need to accommodate the sign of the dependent (accounting) variable as well as the sign of the independent (market) variable following Hausman and Wise (1977) would be an important addition to the study. Other proxies for the "loss effect" might be important.

Moreover, given that the thesis uses methods that are the standard in related research and that these methods account for two principal problems (scale and errors in variables), relatively little emphasis has been given on "technical" (econometric) checks. Existing literature also suggests further developments in the real-options area (e.g. Berger, Ofek and Swary, 1996) and issues of simultaneity (e.g., Beaver, McAnally and Stinson, 1997) within the conservatism framework may be important.

Third, the Fama and MacBeth (1973) cross-sectional method of inferences used in this paper allows incorporating other potential economic determinants (Kothari, 2001; Fama and French, 2000) in the relations under conservative accounting. Some of these include (Ahmed *et al.*, 2002): operating variability as measured by the variability of the return on assets, dividends (and dividend-payouts), leverage, potential growth, impact of R&D and advertising expenses (in particular in the UK context) or controls for varying legal-liability periods (e.g., Basu 1997). Similar structural breaks are also potentially caused by introduction of new accounting regulations. Similarly, cross-sectional estimates might be related to other economic factors (e.g., Klein and Marquardt, 2002).

Fourth, one particular issue affects additional insights that might be obtained in studying the models used in this study estimated from a constant sample of UK firms. While this would certainly raise potentially serious survivorship-bias issues, it might provide additional results that would help to reinforce/refute the findings of this study. However, the construction of such a sample might prove very difficult in that both the accounting year-ends and the length of accounting period are allowed to vary. A related question is the estimation assuming panel data structure (e.g., Greene, 2000). Another related question is the firm-specific estimation that might yield additional benefits (Lipe, Bryant and Widener, 1998; Teets and Wasley, 1996).

Fifth, one particular sensitivity check that has been omitted from this study is the aggregation of both the dependent and the independent variable (Easton, Harris and Ohlson, 1992). The time-series aggregation in this study should lead to increasingly smaller proportions of (principally good) economic news being excluded from the accounting performance measures. This would result in higher R^2s, the coefficient on good news being closer to the cost of capital and the incremental coefficient on aggregate bad news being statistically insignificantly different from zero (Basu, 1997).

Sixth, in the context of interactions between persistence and conservatism (as in Giner and Rees, 2001), a division of this measure into its cash flow and accruals components might prove useful. However, this will likely have to involve resolutions of measurement errors potentially involving some of the techniques listed in the introductory chapter (e.g., Dagenais and Dagenais, 1997; Lewbell, 1997; Dagenais; 1994).

Seventh, some of the results presented in this thesis, particularly the lagged models, appear to be affected by the choice of deflators. The selection of appropriate deflators in studies of conservative accounting might constitute an important area of future research (Ryan and Zarowin, 2003; Akbar and Stark, 2003; Easton and Sommers, 2003; Easton, 1999).

Finally, given the large proportion of non-December 31st fiscal year-end firms, a formal test of systematic differences would be required. Smith and Pourciau (1994) shows that December and non-December year end firms differ systematically in terms of size (see section 5.2) and market risk. This latter in particular represents a formidable task using such a large sample and the database employed in this study.

The list of potential areas of future research does not attempt to be exhaustive, but rather indicative of the issues that are still to be explored in this area of capital market-based accounting research (in particular, contractual aspects have not been discussed in this thesis). To conclude, it must be noted that the literature reviewed does not represent a complete set of research papers in this area. The selection is heavily influenced by the course of studies taken. However,an attempt to provide as complete a review as possible of this large area has been made. Furthermore, given that accounting conservatism is a rapidly expanding area, the bibliography likely does not include all the most recent developments.

Some potential users of the results presented in this thesis. The results from this thesis potentially affect several stakeholders. Perhaps the most pressing issue at this moment is defined by the formal endorsement of *International Financial Reporting Standards* by the European Union (Commission Regulation No. 1727/2003, Official Journal of the European Communities, 29/9/2003, in accordance with Commission Regulation 1606/2002, Official Journal of The European Communities, 11/9/2002) to be applied throughout the EU beginning 2005. Both in the EU and in the US and other regions, is the need for a "high quality" set of accounting standards, providing timely value-relevant information to (equity) investors. Timeliness and particularly asymmetric timeliness is thus viewed as a desirable characteristic of financial statements (performance measures). This study shows some detailed aspects of the timeliness property of accounting performance measures. The findings might be helpful in the standard-convergence process on a global scale, for example by comparing the UK GAAP/IAS(IFRS) standards with US GAAP (e.g. Ashbaugh and Olsson, 2002) and cross-listings (e.g., Hujigen and Lubbering, 2001). In particular, the (asymmetric) timeliness of special items would likely play an important role in this debate. Perhaps an issue immediately related is the link of conservatism with auditors' incentives (e.g., Jeong-Bon, Chung and Firth, 2003; Basu, Hwang and Jan, 2001).

Given that the existence of accounting conservatism induces differences between accounting and market value, these findings also affect investors and financial analysts, who need to adjust their estimates for the effects of both current and past conservative accounting practices. Properties of conservative accounting are important also in contractual terms. Conservatism has been shown to affect both the dividend policy and debt covenants (e.g., Ahmed *et al.*, 2002), there are indications also shown in this study that it varies according to managerial incentives (following Kirschenheiter and Melumad, 2002). Conservatism is also shown to be affected by board composition (Beekes, Pope and Young, 2003) and influence board composition and incentives (Bushman *et al.*, 2004). related to and may have other contractual uses.

Finally, future researchers in the area of capital market-based accounting research might find some sections of this thesis informative. One such topics might be the variable definitions and sample construction sections, an area particularly scarce of detail in existing literature. This research also affects international variations in applications of accounting conservatism that differs not in accounting standards, but rather in terms of legal incentives and infrastructure. This has been explored in a number of settings recently, starting from the Pope and Walker (1999) model (e.g., Basu, Kothari and Robin, 2000; Basu, Kothari and Wu, 2002; Raonic, McLeay and Asimakopoulos, 2004). Recent applications also include properties of accounting earnings of private firms (Ball and Shivakumar, 2004), a particularly scarcely researched area, at least in part due to lack of appropriate data and databases.

APPENDICES

A. LIST OF MAIN VARIABLES AND ASSOCIATED DATASTREAM CODES

Table A-1: List of the main variables used in the empirical study and associated Datastream codes (definitions)

Variable label	Name	Datastream codes (construction formula)
OP	Operating profit	= #137
ORD	Ordinary earnings	= #182
EARN	Earnings after extraordinary and exceptional items	= #182 + #193 + #194
ΔWCAP	Net change in debtors, stock and work-in-progress and creditors	= #448 + #445 - #417
ΔDebtors	Change in debtors	= #448
ΔStock	Change in stock and work in progress	= #445
ΔCreditors	Change in creditors	= #417
DEP	Depreciation and amortisation	= #402 + #562
SPEC	Special items	= -(*OP-ORD*) + #181 + (#153-#143) + (#160-#162+#169+#161-#164)
OCF	Operating cash flow	= *OP* + *DEP* - *ΔWCAP* + #404
ΔCASH	Net change in cash	= #457 pre-FRS 1 (Rev. 1996) and #1134 post-FRS 1 (Rev. 1996)
Accruals (*tot.*)	Total accruals	= *ΔWCAP* + *DEP* + *SPEC*
BV	Book value of equity	= #305
S	Turnover	= #104
P	Share price	= *P*
$RET_{t,t-1}$	Ex-dividend return (deflated by lag one price P_{t-1})	n/a
$PET_{t-\tau,t-\tau-1}$	Ex-dividend return (deflated by price four periods back P_{t-4})	n/a
L_t, L_{t-1}	Current/lagged loss indicator	= 1 if $EARN_t \leq 0$ or $EARN_{t-1} \leq 0$ and zero otherwise
$D_{t,t-1}$, $D_{t-\tau,t-\tau-1}$	Current/lagged bad news indicator	= 1 if $RET_{t,t-1} \leq 0$ or $PET_{t-\tau,t-\tau-1} \leq 0$ and zero otherwise
FTSE All Share	FTSE All Share index	= *FTALLSH*
UKTRSBL	91-day UK TB discount	= *UKTRSBL%*
UKMEDYLD	10-year UK gilt yield	= *UKMEDYLD*
Inflation rate	UK inflation rate	= *UKRPANNL*
$MRET_{t,t-1}$	Market-adjusted ex-dividend return	$= RET_{t,t-1} - \Delta\% FTSE\ All\ Share_{t,t-1}$
$MPET_{t-\tau,t-\tau+1}$	Market-adjusted ex-dividend return	$= PET_{t-\tau,t-\tau-1} - \Delta\% FTSE\ All\ Share_{t-\tau,t-\tau-1}$
$DM_{t,t-1}$, $DM_{t-\tau,t-\tau+1}$	Current/lagged market-adjusted bad news indicator	= 1 if $MRET_{t,t-1} \leq 0$ or $MPET_{t-\tau,t-\tau+1} \leq 0$ and zero otherwise
$NONDECYE_{it}$	Financial year-end indicator	= 1 if firm *i*'s accounting-year end in year *t* is not on the 31st December and zero otherwise

B. CONTEMPORANEOUS AND LAGGED POPE AND WALKER (1999) MODELS ON NET CHANGE IN CASH AND TOTAL ACCRUALS

Table B-1: Descriptive statistics – net change in cash and total accruals, 1969-2001

Variable	Defl.	Mean	St Dev	Min	Q_{25}	Median	Q_{75}	Max	Skew	n
ΔCASH	P_{t-1}	0.006	0.207	-1.909	-0.067	0.000	0.064	3.228	1.217	25,880
Accruals (tot.)	P_{t-1}	-0.045	0.205	-1.459	-0.108	-0.026	0.037	1.001	-0.833	25,888
ΔCASH	P_{t-4}	0.000	0.271	-3.036	-0.082	0.001	0.082	5.021	0.261	20,530
Accruals (tot.)	P_{t-4}	-0.041	0.260	-1.601	-0.134	-0.036	0.048	1.627	0.132	20,536

Notes. Variables are defined as follows: *ΔCASH* is the net change in cash, *Accruals* (*tot.*) is total accruals. Both variables are per share and scaled by P_{t-1} in the contemporaneous and P_{t-4} in the lagged sample. *n* is the total number of observations. Note that the number of observations is lower in the *ΔCASH* variable because reporting this figure is not a requirement to enter the samples. In the case of total accruals, the number of observations is equal to the respective numbers in contemporaneous and lagged samples.

Table B-2: Persistence of net change in cash and total accruals, 1969-2001

Panel A: *ΔCASH*	avg. *n*	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	693.6	0.013		-0.451		0.216
		1.713		-21.489		18.725
ΔX_{t-1} partition	693.6	-0.003	0.030	-0.417	-0.008	0.224
		-0.390	6.780	-16.891	-0.201	19.153
$EARN_t$-level partition	693.6	0.005	0.115	-0.439	-0.070	0.237
		0.601	6.805	-20.344	-1.348	19.789
Lag $RET_{t-1,t-2}$ partition	693.6	-0.007	0.040	-0.387	-0.187	0.236
		-1.133	4.875	-18.626	-7.876	20.162
Panel B: *ΔAccruals (tot.)*	**avg. *n***	$\hat{\pi}_1$	$\hat{\pi}_2$	$\hat{\omega}_1$	$\hat{\omega}_2$	R^2
No partition	689.1	-0.004		-0.421		0.200
		-0.526		-14.564		8.166
ΔX_{t-1} partition	689.1	-0.032	0.027	-0.308	-0.196	0.231
		-4.477	6.136	-6.685	-3.047	9.538
$EARN_t$-level partition	689.1	-0.018	0.077	-0.366	-0.174	0.240
		-2.402	3.046	-11.431	-3.901	10.020
Lag $RET_{t-1,t-2}$ partition	689.1	0.004	-0.016	-0.337	-0.249	0.223
		0.738	-1.711	-10.967	-10.173	9.026

Notes. Estimated regressions are: $(\Delta X_t/P_{t-1})=\pi_1 + \pi_2 \cdot C_{t-1} + \omega_1 \cdot (\Delta X_{t-1}/P_{t-2}) + \omega_2 \cdot C_{t-1} \cdot (\Delta X_{t-1}/P_{t-2}) + \eta_t$ where $\Delta X_t = X_t - X_{t-1}$ and $\Delta X_{t-1} = X_{t-1} - X_{t-2}$ and X_t is an un-deflated, per share dependent variable listed at the top of each panel. Dummy variables C_{t-1} are defined as follows: partitioning byΔX_{t-1}: C_{t-1}={1 if $\Delta X_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged level of earnings after extraordinary and exceptional items $EARN_{t-1}$:C_{t1}= {1 if $EARN_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged returns $RET_{t-1,t-2}$: C_{t-1}={1 if $RET_{t-1,t-2} \leq 0$; 0 otherwise}. All estimates are cross-sectional averages for the period *t*=1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f. Values are restricted to top/bottom 1% of distribution of variables used in the contemporaneous sample as well as to top/bottom 1% of distribution of relevant deflated change variables $\Delta X_t/P_{t-1}$ and $\Delta X_{t-1}/P_{t-2}$ (i.e., the samples used in this table are sub-samples of the contemporaneous sample).

Table B-3: Contemporaneous and lagged restricted and unrestricted Pope and Walker (1999) models of ex-post conservatism on net change in cash and total accruals, 1969-2001

Regression	Deflator	*avg. n*	α_1	α_2	β_1	β_2	β_3	β_4	γ_1	γ_2	γ_3	γ_4	R^2
Net cash flow (*ΔCASH*)													
Restricted	P_{t-1}	784.2	-0.003		**0.065**								**0.021**
			-0.648		**8.253**								**6.029**
Unrestricted	P_{t-1}	784.2	-0.008	-0.002	**0.086**				-0.049				**0.025**
			-1.460	-0.513	**4.172**				-2.019				**6.771**
Restricted	P_{t-4}	622.1	-0.001		**0.050**	**-0.018**	**-0.032**	-0.003					**0.036**
			-0.281		**7.465**	**-3.419**	**-3.557**	-0.507					**8.346**
Unrestricted	P_{t-4}	622.1	-0.014	-0.010	**0.052**	-0.005	-0.025	-0.006	-0.018	**-0.042**	-0.045	-0.043	**0.048**
			-1.963	-1.502	**5.427**	-0.746	-1.192	-0.397	-1.016	**-2.932**	-1.613	-1.611	**9.801**
Total accruals (*Accruals* (*Tot.*))													
Restricted	P_{t-1}	784.5	**-0.042**		**0.030**								**0.007**
			-4.002		**5.447**								**4.515**
Unrestricted	P_{t-1}	784.5	**-0.026**	0.000	-0.008				**0.147**				**0.018**
			-3.170	-0.009	-1.133				**5.800**				**6.164**
Restricted	P_{t-4}	622.3	**-0.046**		**0.034**	**0.055**	**0.021**	0.001					**0.038**
			-3.846		**7.665**	**7.018**	**2.592**	0.065					**9.646**
Unrestricted	P_{t-4}	622.3	-0.014	**-0.022**	0.008	**0.053**	0.014	0.019	**0.065**	0.036	**0.055**	0.041	**0.056**
			-1.214	**-4.282**	1.355	**4.361**	0.838	0.881	**3.834**	1.809	**2.080**	1.681	**10.399**

Notes. Estimated models are either $X_t/P_{t-1} = \alpha_1 + \alpha_2 D_{t,t-1} + \beta_1 RET_{t,t-1} + \gamma_1 D_{t,t-1} RET_{t,t-1} + \varepsilon_t$ (contemporaneous models) or $X_t/P_{t-1} = \alpha_0 + \alpha_1 D_{t,t-1} + \beta_1 PET_{t,t-1} + \beta_2 PET_{t-1,t-2} + \beta_3 PET_{t-2,t-3} + \beta_4 PET_{t-3,t-4} + \gamma_1 D_{t,t-1} PET_{t,t-1} + \gamma_2 D_{t-1,t-2} PET_{t-1,t-2} + \gamma_3 D_{t-2,t-3} PET_{t-2,t-3} + \gamma_4 D_{t-3,t-4} PET_{t-3,t-4} + \varepsilon_t$ (lagged models) where X_t is either the net change in cash (*ΔCASH*) or the total accruals variable *Accruals* (*tot.*) $PET_{t,t-1} = (P_t - P_{t-1})/P_{t-4}$ and $D_{t,t-1} = \{1 \text{ if } PET_{t,t-1} \leq 0; 0 \text{ otherwise}\}$. Both dependent variables are deflated by opening share price P_{t-1} or P_{t-4}.
n is the average number of observations per year. The exact average number of observations may differ from other tables as neither the contemporaneous nor the lagged samples are formed according to these two variables deflated by either deflator. All estimates and R^2s are cross-sectional averages for the period 1969–2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1 = 32 d.f., i.e. $|t|>2.0369$.

C. SENSITIVITY OF LAGGED MODELS TO DIFFERENT DEFLATORS

Table C-1: Descriptive statistics for lagged samples deflated by P_{t-1} and by opening price at each lag, 1969-2001

Panel A: Deflated by P_{t-1}	Mean	St Dev	Min	Q_{25}	Median	Q_{75}	Max	Skew
Cash flows								
ΔCASH	0.007	0.206	-1.717	-0.066	0.000	0.065	3.228	0.978
OCF	0.241	0.244	-0.393	0.102	0.185	0.317	1.895	1.832
Earnings								
OP	0.209	0.189	-0.304	0.101	0.161	0.270	1.439	1.719
ORD	0.097	0.096	-0.422	0.056	0.087	0.131	0.615	0.341
EARN	0.088	0.121	-0.740	0.049	0.085	0.134	0.673	-0.755
Accruals								
ΔWCAP	0.045	0.176	-0.780	-0.018	0.022	0.099	1.010	0.539
- of which *ΔDebtors*	0.056	0.182	-3.545	-0.004	0.026	0.095	4.766	2.402
- of which *ΔStock*	0.051	0.176	-3.184	-0.004	0.014	0.085	2.890	1.070
- of which *ΔCreditors*	-0.062	0.210	-5.863	-0.099	-0.025	0.008	3.164	-2.761
DEP	-0.081	0.077	-0.602	-0.102	-0.058	-0.032	-0.002	-2.520
SPEC	-0.011	0.076	-0.567	-0.022	0.000	0.011	0.314	-1.736
Accruals (tot.)	-0.047	0.209	-1.459	-0.113	-0.028	0.036	1.001	-0.824
Returns								
$PET_{t,t-1}$	0.127	0.446	-0.735	-0.164	0.061	0.339	2.422	1.219
$PET_{t-1,t-2}$	0.027	0.394	-2.389	-0.140	0.093	0.284	0.732	-1.557
$PET_{t-2,t-3}$	0.011	0.424	-2.857	-0.133	0.080	0.252	1.034	-1.856
$PET_{t-3,t-4}$	0.008	0.440	-3.036	-0.125	0.060	0.224	1.461	-1.631
$D_{t,t-1}$	0.435	0.496	0.000	0.000	0.000	1.000	1.000	0.261
$D_{t-1,t-2}$	0.391	0.488	0.000	0.000	0.000	1.000	1.000	0.449
$D_{t-2,t-3}$	0.392	0.488	0.000	0.000	0.000	1.000	1.000	0.442
$D_{t-3,t-4}$	0.404	0.491	0.000	0.000	0.000	1.000	1.000	0.393

Cont.

Panel B: Varying deflators	Mean	St Dev	Min	Q_{25}	Median	Q_{75}	Max	Skew
Cash flows								
ΔCASH	0.014	0.247	-4.230	-0.063	0.001	0.068	4.754	2.555
OCF	0.252	0.296	-2.007	0.104	0.186	0.318	4.216	3.212
Earnings								
OP	0.209	0.226	-2.566	0.099	0.158	0.264	4.389	3.165
ORD	0.094	0.119	-2.346	0.055	0.085	0.128	1.829	-0.320
EARN	0.079	0.164	-2.848	0.048	0.083	0.131	1.836	-3.005
Accruals								
ΔWCAP	0.039	0.207	-2.643	-0.020	0.020	0.093	2.813	0.596
- of which *ΔDebtors*	0.053	0.199	-3.545	-0.005	0.024	0.091	4.766	2.098
- of which *ΔStock*	0.045	0.202	-4.637	-0.005	0.013	0.078	3.176	0.071
- of which *ΔCreditors*	-0.059	0.229	-5.863	-0.094	-0.023	0.009	3.591	-2.338
DEP	-0.085	0.093	-1.715	-0.104	-0.059	-0.033	-0.001	-4.141
SPEC	-0.016	0.105	-2.601	-0.022	0.000	0.011	1.419	-4.923
Accruals (tot.)	-0.063	0.260	-4.171	-0.117	-0.030	0.032	2.587	-2.082
Returns								
$PET_{t,t-1}$	0.128	0.450	-0.735	-0.164	0.059	0.337	2.422	1.248
$PET_{t-1,t-2}$	0.143	0.453	-0.705	-0.152	0.071	0.354	2.467	1.272
$PET_{t-2,t-3}$	0.143	0.448	-0.703	-0.153	0.074	0.357	2.345	1.179
$PET_{t-3,t-4}$	0.137	0.439	-0.698	-0.153	0.070	0.351	2.259	1.147
$D_{t,t-1}$	0.437	0.496	0.000	0.000	0.000	1.000	1.000	0.255
$D_{t-1,t-2}$	0.422	0.494	0.000	0.000	0.000	1.000	1.000	0.315
$D_{t-2,t-3}$	0.420	0.494	0.000	0.000	0.000	1.000	1.000	0.323
$D_{t-3,t-4}$	0.424	0.494	0.000	0.000	0.000	1.000	1.000	0.307

Notes. Variables are defined as follows: *ΔCASH* is the net change in cash, *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock and work in progress, *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and *Accruals* (*tot.*) are total accruals defined as *Accruals* (*tot.*)= *ΔWCAP+DEP+SPEC*. All dependent variables are per share and scaled by P_{t-1}, but the definitions of independent variables change across the two panels. In Panel A, lagged adjusted price differences are scaled by lag-one price P_{t-1} so that $PET_{t-\tau,t-\tau-1} = (P_{t-\tau} - P_{t-\tau-1})/P_{t-1}$, but in Panel B the deflators of adjusted price differences vary with lags so that $PET_{t-\tau,t-\tau-1} = (P_{t-\tau} - P_{t-\tau-1})/P_{t-\tau-1}$. $D_{t-\tau,t-\tau-1}$ are dummy variables defined as $D_{t-\tau,t-\tau-1}$={1 *if* $RET_{t,t-1} \leq 0$; 0 otherwise}. The definitions of dummy variables are independent of the choice of deflators. The number of observations in sample in Panel A is 20,993 (20,987 for the *ΔCASH* variable) and in Panel B: 20,137 (20,131 for the *ΔCASH* variable). The table includes descriptive statistics of the *ΔCASH* and *Accruals* (*tot.*) variables for reason of completeness, but samples are not formed according to these two variables, analogously to formations of the contemporaneous and lagged samples.

Table C-2: Lagged unrestricted Pope and Walker (1999) models of ex-post conservatism, samples deflated by P_{t-1}, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
Cash flows												
ΔCASH	636.0	-0.011	0.001	**0.083**	-0.009	**-0.031**	0.006	-0.044	**-0.037**	0.000	-0.027	**0.046**
		-1.640	0.112	**3.999**	-0.942	**-2.741**	0.527	-1.627	**-2.492**	-0.015	-1.614	**10.064**
OCF	636.2	**0.250**	0.003	**0.101**	**-0.152**	**-0.115**	**-0.049**	0.012	**0.050**	**0.071**	0.013	**0.121**
		18.084	0.394	**9.560**	**-9.976**	**-6.879**	**-3.552**	0.459	**2.402**	**3.499**	0.599	**12.988**
Earnings												
OP	636.2	**0.223**	-0.005	**0.104**	**-0.059**	**-0.047**	-0.016	**0.121**	**0.045**	**0.043**	0.001	**0.190**
		12.144	-0.986	**7.637**	**-5.727**	**-3.841**	-1.386	**5.404**	**2.627**	**3.466**	0.038	**16.994**
ORD	636.2	**0.110**	0.000	**0.066**	**-0.019**	**-0.012**	0.000	**0.105**	**0.039**	**0.029**	0.008	**0.235**
		15.815	0.206	**10.896**	**-3.074**	**-2.390**	-0.028	**9.510**	**4.130**	**5.060**	0.860	**18.134**
EARN	636.2	**0.107**	0.003	**0.067**	-0.009	-0.004	0.014	**0.163**	**0.050**	**0.039**	0.000	**0.217**
		14.336	1.247	**10.727**	-1.593	-0.669	1.891	**12.343**	**5.165**	**4.909**	0.010	**18.402**
Accruals												
ΔWCAP	636.2	**0.051**	-0.006	0.018	**0.041**	**0.027**	0.009	**0.096**	-0.001	-0.017	-0.014	**0.047**
		4.372	-1.760	1.774	**3.857**	**2.658**	0.795	**4.710**	-0.051	-1.147	-0.757	**10.202**
ΔWCAP components:												
- of which *ΔDebtors*	636.2	**0.054**	0.001	**0.036**	**0.046**	0.016	0.008	**0.105**	-0.034	-0.009	-0.031	**0.051**
		6.129	0.351	**4.785**	**4.193**	1.249	0.790	**3.968**	-1.830	-0.535	-1.736	**14.416**
- of which *ΔStock*	636.2	**0.048**	-0.003	**0.035**	**0.040**	0.019	0.014	**0.068**	0.008	-0.016	-0.020	**0.051**
		4.574	-1.082	**3.869**	**3.212**	1.821	1.417	**3.689**	0.456	-0.834	-1.765	**10.826**
-of which *ΔCreditors*	636.2	**-0.051**	-0.004	**-0.053**	**-0.045**	-0.008	-0.012	**-0.077**	0.025	0.008	**0.037**	**0.047**
		-5.761	-1.076	**-6.414**	**-3.521**	-0.678	-1.183	**-2.952**	1.155	0.437	**2.114**	**13.134**

Cont.

Dependent variables	avg. n	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
DEP	636.2	**-0.084**	-0.001	**-0.016**	**0.057**	**0.046**	**0.027**	0.012	-0.007	**-0.016**	-0.001	**0.127**
		-16.785	-0.506	**-4.414**	**9.082**	**8.009**	**5.874**	1.631	-0.851	**-2.325**	-0.119	**13.581**
SPEC	636.2	0.002	0.002	**-0.007**	0.002	0.002	0.009	**0.061**	**0.016**	**0.015**	-0.003	**0.058**
		0.803	1.615	**-2.064**	0.466	0.426	1.735	**6.931**	**2.343**	**2.455**	-0.412	**10.774**
Accruals (tot.)	636.2	**-0.031**	-0.005	-0.005	**0.100**	**0.075**	**0.045**	**0.169**	0.008	-0.019	-0.017	**0.091**
		-2.608	-1.394	-0.516	**7.875**	**6.008**	**3.421**	**7.053**	0.417	-0.997	-0.854	**10.302**

Notes. Estimated models are: $(X_t/P_{t-1})=\alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1}PET_{t,t-1}+\gamma_2 D_{t-1,t-2}PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3}PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4}PET_{t-3,t-4}+\varepsilon_t$ where X_t is an un-deflated dependent variable listed in the leftmost column of table: *ΔCASH* is the net change in cash, *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and *Accruals (tot.)* are total accruals defined as *Accruals (tot.)= ΔWCAP+DEP+SPEC*. The ex-dividend returns are calculated so that the deflator is for each dependent variable and for each adjusted price-difference the lag one price P_{t-1} and thus $PET_{t-\tau,t-\tau-1}=(P_{t-\tau}-P_{t-\tau-1})/P_{t-1}$ and $D_{t-\tau,t-\tau-1}=\{1$ if $PET_{t,t-1}\leq 0$; 0 otherwise$\}$. All dependent variables are deflated by opening share price P_{t-1}. n is the average number of observations per year. All estimates and R^2s are cross-sectional averages for the period 1969–2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1= 32 d.f., i.e. $|t|>2.0369$. The table includes regressions on *ΔCASH* and *Accruals (tot.)* for reason of completeness, but the samples are not formed according to these two variables, analogously to formations of the contemporaneous and lagged samples.

Table C-3: Lagged unrestricted Pope and Walker (1999) models of ex-post conservatism, samples constructed with varying deflators, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
Cash flows												
ΔCASH	610.0	**-0.024**	0.002	**0.100**	0.002	-0.001	0.001	-0.034	**-0.168**	**-0.099**	-0.046	**0.058**
		-3.710	0.238	5.568	0.325	-0.106	0.149	-1.091	-6.077	-3.714	-1.752	11.335
OCF	610.2	**0.208**	0.008	**0.120**	**-0.062**	**-0.051**	**-0.037**	0.040	**-0.250**	**-0.132**	**-0.101**	**0.142**
		16.410	0.973	8.067	-7.145	-5.160	-5.802	1.373	-6.081	-3.287	-3.407	12.524
Earnings												
OP	610.2	**0.209**	0.000	**0.117**	**-0.040**	**-0.033**	-0.016	**0.124**	0.001	-0.016	-0.048	**0.193**
		13.513	-0.049	6.808	-5.363	-5.922	-1.961	4.030	0.036	-0.697	-1.904	17.975
ORD	610.2	**0.112**	0.003	**0.073**	**-0.014**	**-0.013**	-0.002	**0.112**	**0.087**	**0.054**	0.015	**0.223**
		16.999	1.073	9.257	-3.340	-5.003	-0.493	7.111	5.206	3.821	1.168	22.055
EARN	610.2	**0.117**	**0.007**	**0.076**	**-0.011**	**-0.011**	0.006	**0.189**	**0.154**	**0.104**	**0.038**	**0.204**
		15.067	2.175	9.282	-2.312	-3.451	1.078	8.264	6.419	5.224	2.248	23.005
Accruals												
ΔWCAP	610.2	**0.061**	-0.007	0.012	-0.002	-0.003	0.003	**0.070**	**0.140**	0.032	-0.006	**0.054**
		6.677	-1.615	1.287	-0.382	-0.404	0.405	3.446	4.841	1.261	-0.223	9.121
ΔWCAP components:												
- of which *ΔDebtors*	610.2	**0.056**	0.001	**0.040**	0.003	-0.005	0.004	**0.067**	**0.058**	-0.005	**-0.044**	**0.052**
		7.186	0.200	5.009	0.600	-0.787	0.335	2.507	2.435	-0.213	-2.021	15.435
- of which *ΔStock*	610.2	**0.058**	-0.001	**0.032**	-0.009	-0.003	0.008	**0.071**	**0.162**	0.021	-0.026	**0.059**
		6.448	-0.354	3.470	-1.623	-0.331	1.228	4.066	4.573	0.649	-0.978	10.642
-of which *ΔCreditors*	610.2	**-0.053**	-0.006	**-0.060**	0.004	0.004	-0.009	**-0.068**	**-0.080**	0.016	**0.064**	**0.047**
		-5.680	-1.307	-6.636	0.584	0.671	-0.831	-2.545	-2.196	0.596	2.624	11.978

Cont.

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
DEP	610.2	**-0.064**	-0.001	**-0.017**	**0.026**	**0.023**	**0.020**	**0.015**	**0.117**	**0.081**	**0.065**	**0.182**
		-14.533	-0.588	**-4.484**	**8.477**	**7.575**	**7.531**	**2.255**	**8.697**	**7.566**	**6.569**	**15.916**
SPEC	610.2	**0.007**	**0.005**	-0.005	0.001	0.000	**0.007**	**0.083**	**0.062**	**0.052**	**0.028**	**0.061**
		2.500	**2.258**	-1.368	0.645	0.053	**2.074**	**6.455**	**4.376**	**5.386**	**2.890**	**10.840**
Accruals (tot.)	610.2	0.004	-0.003	-0.009	**0.026**	**0.019**	**0.030**	**0.168**	**0.319**	**0.165**	**0.087**	**0.114**
		0.360	-0.577	-1.082	**3.628**	**2.177**	**3.068**	**6.205**	**8.073**	**4.589**	**3.084**	**8.796**

Notes. Estimated models are: $(X_t/P_{t-1})=\alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1}PET_{t,t-1}$ $+\gamma_2 D_{t-1,t-2}PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3}PET_{t-2,t-3}+$ $+\gamma_4 D_{t-3,t-4}PET_{t-3,t-4}+\varepsilon_t$ where X_t is an un-deflated dependent variable listed in the leftmost column of table: *ΔCASH* is the net change in cash, *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and *Accruals* (*tot.*) are total accruals defined as *Accruals* (*tot.*)= *ΔWCAP+DEP+SPEC*. Each dependent accounting variable is deflated by the opening price Pt-1, but the deflators of adjusted price differences vary with lags so that $PET_{t-\tau,t-\tau-1}=(P_{t-\tau}-P_{t-\tau-1})/P_{t-\tau-1}$. Deflators do not affect the dummy variable so that $D_{t-\tau,t-\tau-1}=\{1 \text{ if } PET_{t,t-1}\leq 0;\ 0 \text{ otherwise}\}$. All dependent variables are deflated by opening share price P_{t-1}. *n* is the average number of observations per year. All estimates and R^2s are cross–sectional averages for the period 1969–2001 and associated *t*–statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1= 32 d.f., i.e. $|t|>2.0369$. The table includes regressions on *ΔCASH* and *Accruals* (*tot.*) for reason of completeness, but the samples are not formed according to these two variables, analogously to formations of the contemporaneous and lagged samples.

D. DETAILS ON PERSISTENCE COEFFICIENT TESTS

Table D-1: Persistenced tests – number of times coefficients equal the expected value, 1969-2001

PANEL A: Operating cash flows (OCF)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.35$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.35$
No partition	-0.345			22		
	-12.046					
ΔOCF_{t-1} partition	-0.305	-0.001	-0.306	15	12	20
	-9.145	-0.013				
$EARN_{t-1}$-level partition	-0.332	-0.107	-0.438	15	15	20
	-12.660	-1.074				
$RET_{t-1,t-2}$ partition	-0.260	-0.230	-0.490	18	20	19
	-11.318	-6.353				

PANEL B: Operating profit (OP)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=0.00$	$\hat{\omega}_2=-0.50$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	-0.058			20		
	-2.594					
ΔOP_{t-1} partition	0.063	-0.503	-0.441	13	14	18
	2.996	-9.711				
$EARN_{t-1}$-level partition	0.033	-0.271	-0.237	11	21	26
	1.822	-6.226				
$RET_{t-1,t-2}$ partition	0.009	-0.183	-0.174	9	21	26
	0.400	-6.139				

PANEL C: Ordinary earnings (ORD)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=0.00$	$\hat{\omega}_2=-0.50$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	-0.067			18		
	-2.925					
ΔORD_{t-1} partition	0.101	-0.690	-0.589	18	21	19
	4.613	-11.750				
$EARN_{t-1}$-level partition	0.046	-0.312	-0.266	18	24	25
	2.294	-4.972				
$RET_{t-1,t-2}$ partition	0.029	-0.233	-0.204	18	24	27
	1.347	-7.103				

PANEL D: Earnings after ex'ord. and ex'nal. items (EARN)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=0.00$	$\hat{\omega}_2=-0.50$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	-0.234			31		
	-7.307					
$\Delta EARN_{t-1}$ partition	-0.054	-0.696	-0.750	12	25	27
	-1.529	-9.681				
$EARN_{t-1}$-level partition	-0.069	-0.397	-0.467	19	24	22
	-2.739	-3.460				
$RET_{t-1,t-2}$ partition	-0.121	-0.300	-0.422	25	20	23
	-4.003	-6.521				

Cont.

PANEL E: Working capital accruals (*ΔWCAP*)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.407**			21		
	-20.117					
$\Delta(\Delta WCAP_{t-1})$ partition	**-0.296**	**-0.147**	-0.443	23	17	12
	-6.964	**-2.362**				
$EARN_{t-1}$-level partition	**-0.390**	**-0.118**	-0.508	24	11	18
	-19.190	**-2.206**				
$RET_{t-1,t-2}$ partition	**-0.337**	**-0.204**	-0.541	25	19	10
	-19.212	**-8.873**				

PANEL E-1: *ΔWCAP* component – ΔDebtors	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.423**			24		
	-17.369					
$\Delta Debtors_{t-1}$ partition	**-0.344**	**-0.117**	-0.461	20	20	12
	-9.498	**-2.969**				
$EARN_{t-1}$-level partition	**-0.417**	-0.099	-0.516	23	13	16
	-17.444	-1.167				
$RET_{t-1,t-2}$ partition	**-0.353**	**-0.220**	-0.573	25	21	18
	-16.240	**-7.081**				

PANEL E-2: *ΔWCAP* component – ΔStock	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.392**			28		
	-11.608					
$\Delta Stock_{t-1}$ partition	**-0.334**	-0.152	-0.486	26	23	19
	-6.986	-1.847				
$EARN_{t-1}$-level partition	**-0.380**	-0.151	-0.532	28	9	17
	-10.567	-1.234				
$RET_{t-1,t-2}$ partition	**-0.339**	**-0.181**	-0.519	26	17	17
	-9.429	**-6.403**				

PANEL E-3: *ΔWCAP* component – ΔCreditors	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.451**			24		
	-15.881					
$\Delta Creditors_{t-1}$ partition	**-0.415**	-0.002	-0.417	16	13	25
	-14.515	-0.039				
$EARN_{t-1}$-level partition	**-0.440**	-0.061	-0.501	23	16	15
	-15.206	-1.211				
$RET_{t-1,t-2}$ partition	**-0.405**	**-0.153**	-0.558	24	12	16
	-14.078	**-5.288**				

PANEL F: Depreciation and amortisation (*DEP*)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=0.00$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=0.00$
No partition	0.001			7		
	0.031					
ΔDEP_{t-1} partition	-0.001	0.490	0.489	8	1	1
	-0.038	0.274				
$EARN_{t-1}$-level partition	-0.036	-0.452	-0.488	5	6	6
	-1.424	-1.086				
$RET_{t-1,t-2}$ partition	-0.024	-0.080	-0.104	5	9	12
	-0.945	-0.344				

Cont.

PANEL G: Special items (*SPEC*)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.413** **-12.246**			22		
$\Delta SPEC_{t-1}$ partition	**-0.288** **-7.178**	**-0.292** **-3.544**	-0.580	27	26	24
$EARN_{t-1}$-level partition	**-0.271** **-9.501**	**-0.422** **-4.536**	-0.693	29	26	17
$RET_{t-1,t-2}$ partition	**-0.256** **-10.310**	**-0.337** **-6.262**	-0.594	28	24	17

PANEL H: Net change in cash ($\Delta CASH$)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.451** **-21.489**			19		
$\Delta(\Delta CASH_{t-1})$ partition	**-0.417** **-16.891**	-0.008 -0.201	-0.426	17	10	17
$EARN_{t-1}$-level partition	**-0.439** **-20.344**	-0.070 -1.348	-0.509	20	10	13
$RET_{t-1,t-2}$ partition	**-0.388** **-20.473**	-0.025 -0.146	-0.412	23	21	14

PANEL I: Total accruals (*Accruals (tot.)*)	$\hat{\omega}_1$	$\hat{\omega}_2$	$\hat{\omega}_1+\hat{\omega}_2$	$\hat{\omega}_1=-0.50$	$\hat{\omega}_2=0.00$	$\hat{\omega}_1+\hat{\omega}_2=-0.50$
No partition	**-0.421** **-14.564**			22		
Δ(*Accruals (tot.)*$_{t-1}$) part.	**-0.308** **-6.685**	**-0.196** **-3.047**	-0.505	25	19	15
$EARN_{t-1}$-level partition	**-0.366** **-11.431**	**-0.174** **-3.901**	-0.540	27	14	15
$RET_{t-1,t-2}$ partition	**-0.337** **-10.967**	**-0.249** **-10.173**	-0.586	29	24	19

Notes. Estimated regressions are: $(\Delta X_t/P_{t-1}) = \pi_1 + \pi_2 C_{t-1} + \omega_1(\Delta X_{t-1}/P_{t-2}) + \omega_2 C_{t-1}(\Delta X_{t-1}/P_{t-2}) + \eta_t$ where $\Delta X_t = X_t - X_{t-1}$ and $\Delta X_{t-1} = X_{t-1} - X_{t-2}$ and X_t is an un-deflated, per share dependent variable listed at the top of each panel. Dummy variables C_{t-1} are defined as follows: partitioning by ΔX_{t-1}: C_{t-1}= {1 if $\Delta X_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged level of earnings after extraordinary and exceptional items $EARN_{t-1}$: C_{t-1}= {1 if $EARN_{t-1} \leq 0$; 0 otherwise}; partitioning by lagged returns $RET_{t-1,t-2}$:C_{t-1}= {1 if $RET_{t-1,t-2} \leq 0$; 0 otherwise}.

All estimates are cross-sectional averages for the period t=1969-2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f. Values are restricted to top/bottom 1% of distribution of variables used in the contemporaneous sample as well as to top/bottom 1% of distribution of relevant deflated change variables $\Delta X_t/P_{t-1}$ and $\Delta X_{t-1}/P_{t-2}$ (i.e., the samples used in this table are sub-samples of the contemporaneous sample).

The test statistics of equality of coefficients to those listed in Table 3-11 in section 3.4 are t-statistics calculated for each year and for each coefficient/linear combination of coefficients. The numbers in the table indicate the number of times the estimated coefficient is equal to the expected value listed in the head of each panel.

E. FORMAL TESTS OF DIFFERENCES BETWEEN RESTRICTED AND UNRESTRICTED VERISONS OF CONTEMPORANEOUS AND LAGGED MODELS

Table E-1: Formal tests of differences between restricted and urestricted versions of contemporaneous and lagged models, 1969-2001

	Number of times differences between restricted and unrestricted cross-sections are significant	
Dependent variable	Contemporaneous	Lagged
Cash flows		
ΔCASH	5	8
OCF	11	9
Earnings		
OP	23	17
ORD	27	26
EARN	28	26
Accruals		
ΔWCAP	10	10
- of which *ΔDebtorrs*	5	9
- of which *ΔStock*	5	12
- of which *ΔCreditors*	3	6
DEP	6	6
SPEC	15	18
Accruals (*tot.*)	16	16

Notes. Estimated models are either $X_t/P_{t-1}= \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1} RET_{t,t-1}+\varepsilon_t$ (contemporaneous models) or $X_t/P_{t-1}= \alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+$ $+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1} PET_{t,t-1}+\gamma_2 D_{t-1,t-2} PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3} PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4} PET_{t-3,t-4}+\varepsilon_t$ (lagged models) where X_t is a dependendt variable defined as follows: *ΔCASH* is the net change in cash, *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items (ordinary earnings), *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in creditors, *ΔStock* is the change in stock , *ΔCreditors* is the change in creditors, *DEP* is depreciation and amortisation expense, *SPEC* is special items and the measure of total accruals is *Accruals=ΔWCAP+DEP+SPEC*. All variables are per share and scaled by P_{t-1} for the contemporaneous models and by P_{t-4} for the lagged models, returns variable are defined either as $RET_{t,t-1}=(P_t-P_{t-1})/P_{t-1}$ or as $PET_{t-\tau,t-\tau-1}=(P_{t-\tau}-P_{t-\tau-1})/P_{t-4}$ in the extended versions.

F. CONTEMPORANEOUS AND LAGGED REGRESSIONS INCLUDING OUTLIERS

Table F-1: Contemporaneous models of accounting conservatism, by earnings components, including additional variables, and including all outliers, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\gamma}_1$	R^2	$\hat{\beta}_1+\hat{\gamma}_1$	$\frac{(\hat{\beta}_1+\hat{\gamma}_1)}{\hat{\beta}_1}$
Cash flows								
ΔCASH	861.2	-0.003	0.030	**0.096**	0.062	**0.024**	0.158	1.650
		-0.477	0.877	**5.387**	0.602	**5.957**		
OCF	860.1	**0.263**	0.016	**0.103**	0.163	**0.045**	0.266	2.593
		12.714	0.442	**4.901**	1.503	**5.693**		
Earnings								
OP	863.8	**0.238**	**-0.018**	**0.098**	**0.208**	**0.089**	0.306	3.112
		10.516	**-2.314**	**5.248**	**7.934**	**9.497**		
ORD	863.8	**0.112**	-0.008	**0.046**	**0.208**	**0.086**	0.254	5.463
		13.695	-1.449	**5.288**	**8.718**	**11.111**		
EARN	863.8	**0.106**	-0.001	**0.052**	**0.321**	**0.069**	0.373	7.181
		11.541	-0.158	**5.195**	**8.215**	**13.327**		
Accruals								
ΔWCAP	861.1	**0.057**	-0.035	0.022	0.014	**0.023**	0.037	1.650
		5.052	-1.005	1.750	0.150	**4.279**		
ΔWCAP components:								
- of which *ΔDebtors*	861.1	**0.070**	-0.042	**0.045**	-0.031	**0.030**	0.014	0.301
		6.911	-1.087	**4.137**	-0.300	**3.959**		
- of which *ΔStock*	861.2	**0.056**	0.002	**0.041**	**0.086**	**0.021**	0.127	3.106
		4.787	0.233	**2.871**	**3.028**	**5.034**		
-of which *ΔCreditors*	861.2	**-0.068**	0.005	**-0.064**	-0.040	**0.030**	-0.104	1.629
		-6.368	0.453	**-4.655**	-1.713	**5.629**		
DEP	860.9	**-0.085**	0.001	**-0.028**	**0.028**	**0.029**	0.000	-0.016
		-14.556	0.282	**-5.663**	**3.079**	**5.258**		
SPEC	859.4	-0.006	0.007	-0.002	**0.118**	**0.017**	0.116	-56.171
		-1.609	1.820	-0.405	**5.208**	**6.808**		
Accruals (tot.)	855.8	**-0.033**	-0.027	-0.008	0.162	**0.020**	0.154	-19.644
		-2.753	-0.729	-0.639	1.544	**5.848**		

Notes. Estimated models are: $X_t/P_{t-1} = \alpha_1+\alpha_2 D_{t,t-1}+\beta_1 RET_{t,t-1}+\gamma_1 D_{t,t-1} RET_{t,t-1}+\varepsilon_t$ where X_t is an undeflated, per share dependent variable listed in the leftmost column of the table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is change in debtors accounts, *ΔStock* is change in stock, *ΔCreditors* is change in creditors accounts, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $RET_{t,t-1} = (P_t - P_{t-1})/P_{t-1}$ and $D_{t,t-1} = \{1$ if $RET_{t,t-1} \leq 0$; 0 otherwise$\}$. All variables are deflated by opening share price P_{t-1}. *Avg. n* is the average number of observations per year. All coefficients' estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated t-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33-1= 32 d.f., i.e.,$|t|>2.0369$. Regressions include all observations that have the non-missing values separately by each variable (the average number of observations changes accordingly)

Table F-2: Lagged models of accounting conservatism by earnings components, including additional variables, and including all outliers, 1969-2001

Dependent variables	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
Cash flows												
ΔCASH	718.3	-0.015	-0.007	**0.051**	0.021	-0.035	0.012	0.030	**-0.097**	-0.097	-0.029	**0.106**
		-1.252	-0.306	5.239	1.157	-2.006	0.821	0.688	-2.703	-0.777	-0.683	5.286
OCF	717.2	**0.314**	-0.033	**0.059**	**0.086**	**0.099**	**0.218**	0.075	0.074	0.023	0.038	**0.166**
		12.696	-1.214	3.482	4.558	4.113	7.114	1.662	1.627	0.185	0.541	7.988
Earnings												
OP	720.4	**0.297**	**-0.056**	**0.073**	**0.126**	**0.135**	**0.197**	**0.123**	**0.103**	**0.121**	0.058	**0.292**
		10.358	-4.374	3.094	7.373	6.322	7.085	4.913	3.771	3.823	1.290	11.331
ORD	720.4	**0.147**	**-0.035**	**0.041**	**0.074**	**0.075**	**0.093**	**0.091**	**0.071**	**0.070**	**0.066**	**0.272**
		13.076	-4.167	3.290	7.958	6.513	6.867	5.894	4.111	3.975	2.770	11.243
EARN	720.4	**0.155**	**-0.046**	**0.037**	**0.083**	**0.077**	**0.126**	**0.131**	**0.089**	**0.106**	**0.063**	**0.230**
		12.502	-3.820	2.970	7.438	5.513	6.311	5.646	4.642	4.901	2.087	10.352
Accruals												
ΔWCAP	718.0	**0.079**	-0.029	0.020	**0.060**	**0.063**	0.031	0.048	0.034	0.107	0.013	**0.129**
		4.451	-1.096	1.221	2.902	3.194	1.790	1.263	0.945	0.886	0.300	5.553
ΔWCAP components:												
- of which *ΔDebtors*	718.0	**0.071**	-0.016	**0.060**	**0.060**	**0.063**	**0.045**	0.003	0.031	0.081	-0.029	**0.173**
		3.944	-0.558	3.834	3.630	3.418	2.630	0.087	1.051	0.598	-0.684	5.686
- of which *ΔStock*	718.1	**0.061**	-0.015	0.033	**0.068**	**0.056**	**0.051**	0.041	0.012	0.008	-0.011	**0.114**
		3.953	-1.407	1.807	3.418	3.391	2.744	1.330	0.269	0.301	-0.307	7.790
-of which *ΔCreditors*	718.1	**-0.053**	0.002	**-0.072**	**-0.068**	**-0.056**	**-0.064**	0.004	-0.009	0.017	0.054	**0.147**
		-4.015	0.128	-4.375	-4.227	-3.285	-2.993	0.190	-0.256	0.474	1.514	6.569

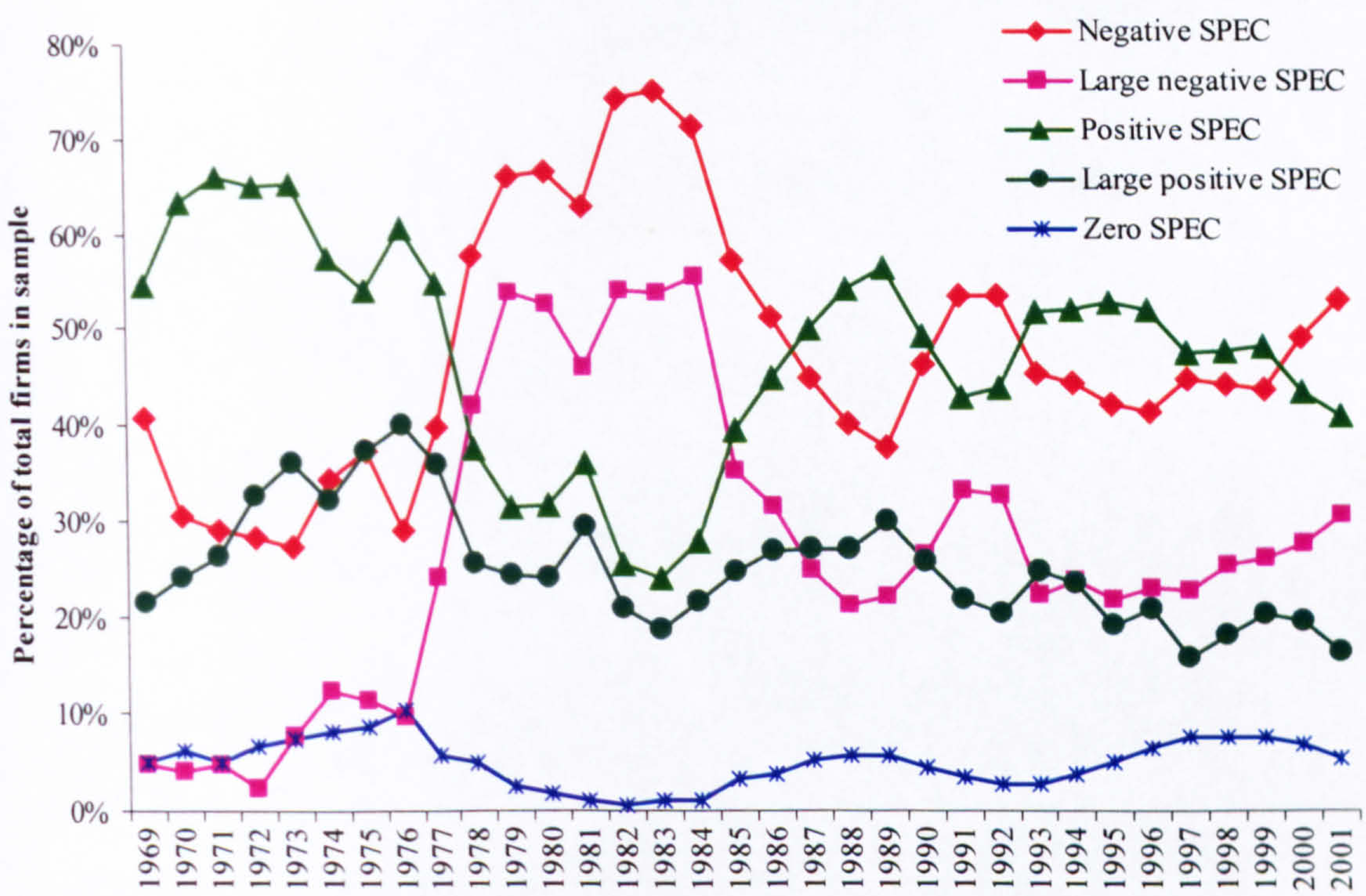
Cont.

Dependent variables	avg. n	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
DEP	718.0	**-0.101**	0.007	-0.006	**-0.022**	**-0.028**	**-0.054**	-0.002	0.001	-0.009	0.004	**0.156**
		-12.263	1.709	-1.142	**-5.518**	**-5.030**	**-5.398**	-0.254	0.084	-0.847	0.309	**7.843**
SPEC	716.7	0.009	-0.007	-0.008	0.006	-0.002	0.026	**0.042**	0.017	**0.034**	0.015	**0.086**
		1.938	-1.398	-1.695	1.046	-0.262	1.088	**2.593**	1.474	**2.450**	0.557	**6.136**
Accruals (tot.)	713.6	-0.014	-0.029	0.007	**0.042**	0.034	0.003	**0.088**	0.053	0.132	0.035	**0.106**
		-0.846	-1.011	0.490	**2.060**	1.531	0.128	**2.370**	1.359	1.044	0.760	**5.077**

Notes. Estimated models are: $X_t/P_{t-1}= \alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1} PET_{t,t-1}+\gamma_2 D_{t-1,t-2} PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3} PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4} PET_{t-3,t-4}+\varepsilon_t$ where X_t is an undeflated dependent variable listed in the leftmost column of table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $PET_{t,t-1}= (P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=$ {1 if $PET_{t,t-1} \leq 0$; 0 otherwise}. All dependent variables are deflated by opening share price P_{t-1}. *n* is the average number of observations per year. All estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1 = 32 d.f., i.e., $|t|>2.0369$. Regressions include all observations that have the non-missing values separately by each variable (the average number of observations changes accordingly)

G. ADDITIONAL INFORMATION ON TIME-SERIES TRENDS IN SPECIAL ITEMS (SPEC)

Figure G-1: Frequencies of positive and negative special items (*SPEC*) per year, 1969-2001



Notes. *SPEC* are special items. Shown are percentages of total number of firms within each year. The term "large" denotes observations where $|SPEC_{it}| \geq 1\%$ of special items relative to the opening book value of total assets A_{it-1} (e.g Elliott and Shaw, 1988; Elliott and Hanna, 1996).

Table G-1: Time-trend regressions of percentages of firms reporting positve and negative special items (*SPEC*), 1969-2001

Percentages of firms reporting:	$\hat{\tau}_1$	$\hat{\tau}_2$	*adj. R^2*
Negative *SPEC*	**0.474**	0.003	0.022
	20.695	1.307	0.201
Large negative *SPEC*	**0.271**	0.004	0.047
	10.174	1.605	0.119
Positive *SPEC*	**0.477**	-0.003	0.039
	24.488	-1.511	0.141
Large positive *SPEC*	**0.253**	**-0.004**	**0.367**
	30.039	**-4.421**	**0.000**
Zero *SPEC*	**0.049**	0.000	-0.032
	11.264	-0.116	0.909

Notes. Estimated regressions are: % *of firms reporting* = $\tau_1 + \tau_2 T + \xi$ *T* denotes the technical time T = [-16,...0,+16] . Below each of the estimated τ_1 and $\tau_2$coefficients is the time-trend *t*-statistics and below the adjusted R^2s are the exact levels of significance based on the *F*-statistic. Boldfaced estimates are significant at 5% or better (critical values are $t_{c,\alpha=0.05}$(31 d.f.)= 2.040.

H. LAGGED MODELS OF CONSERVATISM BY SIZE TERTILES

Table H-1: Lagged models of ex-post accounting conservatism by size tertiles (opening market capitalisation), 1969-2001

Dependent var	Opening mkt. cap. rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
OCF	1	179.8	**0.282**	-0.010	**0.100**	**0.123**	**0.150**	**0.257**	0.108	0.066	0.054	-0.081	**0.255**
			19.416	-0.594	6.564	3.853	2.078	9.420	1.817	1.429	0.625	-1.856	16.972
	2	191.3	**0.249**	0.006	**0.072**	**0.128**	**0.133**	**0.131**	**0.073**	0.025	-0.001	0.046	**0.298**
			12.578	0.478	3.488	4.690	7.211	2.638	2.492	0.722	-0.041	0.773	17.832
	3	222.9	**0.244**	**-0.016**	**0.031**	**0.055**	**0.087**	-0.123	0.026	**0.061**	0.036	0.231	**0.203**
			15.673	-3.136	2.577	4.336	3.749	-0.498	1.059	2.334	1.087	0.902	16.634
OP	1	179.8	**0.251**	-0.016	**0.127**	**0.181**	**0.170**	**0.256**	**0.171**	0.080	0.050	-0.046	**0.455**
			12.985	-1.220	6.894	6.078	2.864	8.739	3.547	1.740	0.638	-1.291	29.374
	2	191.3	**0.274**	-0.060	0.048	**0.158**	**0.157**	**0.159**	**0.148**	0.032	0.027	-0.003	**0.553**
			4.934	-1.221	1.000	10.098	10.248	6.663	2.876	1.822	0.788	-0.114	29.629
	3	222.9	**0.214**	**-0.016**	**0.056**	**0.118**	0.063	-0.011	**0.051**	0.038	0.106	0.176	**0.438**
			13.921	-3.539	5.485	6.253	1.000	-0.078	3.055	1.771	1.598	1.201	18.355
ORD	1	179.8	**0.128**	**-0.014**	**0.074**	**0.099**	0.065	**0.147**	**0.108**	**0.064**	0.079	-0.024	**0.475**
			13.721	-2.143	6.828	5.164	1.088	8.372	4.381	2.258	1.089	-0.873	27.651
	2	191.3	**0.130**	-0.025	**0.041**	**0.091**	**0.082**	**0.089**	**0.092**	**0.032**	0.026	0.007	**0.606**
			6.671	-1.393	2.549	10.441	9.440	10.839	4.862	3.077	1.749	0.607	31.758
	3	222.9	**0.106**	**-0.009**	**0.031**	**0.067**	**0.050**	0.008	**0.046**	**0.033**	**0.058**	0.086	**0.508**
			20.148	-3.144	6.019	8.133	2.200	0.129	4.767	3.449	2.295	1.289	21.479

Cont.

Dependent var	Opening mkt. cap. rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
EARN	1	179.8	**0.136**	**-0.023**	**0.066**	**0.111**	0.065	**0.159**	**0.132**	**0.069**	0.104	-0.020	**0.425**
			12.829	**-3.017**	**5.802**	**5.798**	1.264	**8.712**	**5.079**	**2.417**	1.623	-0.684	**24.995**
	2	191.3	**0.131**	-0.028	**0.043**	**0.105**	**0.077**	**0.102**	**0.114**	0.028	**0.049**	0.006	**0.519**
			7.201	-1.712	**3.513**	**6.762**	**7.945**	**9.256**	**7.675**	1.693	**2.718**	0.336	**26.182**
	3	222.9	**0.105**	**-0.016**	**0.031**	**0.072**	0.033	0.048	**0.062**	**0.051**	0.089	0.060	**0.430**
			16.493	**-3.373**	**4.899**	**8.070**	0.769	1.540	**4.312**	**4.845**	1.922	1.731	**24.811**
ΔWCAP	1	179.8	**0.073**	-0.014	0.023	**0.109**	0.076	**0.061**	**0.085**	0.003	-0.008	0.033	**0.149**
			4.688	-1.404	1.781	**5.121**	1.649	**2.527**	**2.774**	0.089	-0.144	1.144	**8.089**
	2	191.3	0.108	-0.069	-0.024	0.047	**0.064**	**0.074**	0.083	0.017	0.027	**-0.064**	**0.143**
			2.029	-1.425	-0.579	1.793	**4.116**	**2.758**	1.682	0.453	0.857	**-2.108**	**9.970**
	3	222.9	**0.041**	-0.002	**0.018**	**0.069**	**0.038**	0.128	0.025	-0.017	0.026	-0.056	**0.132**
			3.875	-0.332	**2.109**	**4.664**	**2.259**	1.357	1.411	-0.670	0.811	-0.551	**10.797**
- of which *ΔDebtors*	1	179.8	**0.048**	-0.015	**0.076**	**0.124**	0.060	0.059	-0.057	-0.079	-0.020	-0.013	**0.173**
			2.664	-0.602	**3.507**	**6.390**	0.780	1.999	-0.485	-1.555	-0.200	-0.247	**9.805**
	2	191.3	**0.064**	-0.026	0.033	**0.076**	**0.071**	0.021	0.020	-0.033	-0.017	-0.001	**0.187**
			2.599	-1.416	1.333	**5.578**	**3.840**	1.111	0.538	-0.920	-0.467	-0.050	**11.379**
	3	222.9	**0.043**	0.008	0.023	**0.060**	**0.058**	**0.094**	0.028	0.064	-0.011	-0.048	**0.141**
			3.735	1.116	1.938	**4.251**	**4.616**	**2.693**	1.284	1.615	-0.377	-1.148	**15.129**
- of which *ΔStock*	1	179.8	**0.077**	-0.021	0.013	**0.074**	0.091	**0.058**	**0.075**	0.026	-0.042	0.022	**0.141**
			4.594	-1.262	0.927	**2.862**	1.663	**2.299**	**2.055**	0.683	-0.615	0.854	**7.691**
	2	191.3	0.107	-0.071	-0.025	**0.037**	**0.068**	**0.050**	0.074	0.058	-0.012	**-0.080**	**0.142**
			1.915	-1.464	-0.481	**2.055**	**4.032**	**2.586**	1.203	1.834	-0.309	**-2.151**	**11.909**
	3	222.9	**0.049**	0.000	0.025	**0.075**	**0.047**	0.032	**0.048**	0.012	0.045	0.021	**0.141**
			3.460	-0.016	1.935	**4.078**	**2.878**	1.867	**2.304**	0.369	1.055	0.687	**9.270**

Cont.

Dependent var	Opening mkt. cap. rank	*avg. n*	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\beta}_1$	$\hat{\beta}_2$	$\hat{\beta}_3$	$\hat{\beta}_4$	$\hat{\gamma}_1$	$\hat{\gamma}_2$	$\hat{\gamma}_3$	$\hat{\gamma}_4$	R^2
-of which *ΔCreditors*	1	179.8	**-0.052**	0.021	**-0.065**	**-0.089**	-0.075	-0.056	0.066	0.056	0.055	0.024	**0.146**
			-2.601	0.685	**-3.365**	**-3.280**	-0.952	-1.536	0.512	1.362	0.545	0.400	**8.389**
	2	191.3	**-0.063**	0.027	-0.032	**-0.065**	**-0.075**	0.003	-0.011	-0.008	0.056	0.018	**0.152**
			-2.266	1.548	-0.895	**-3.838**	**-3.236**	0.095	-0.215	-0.182	1.328	0.345	**10.619**
	3	222.9	**-0.051**	-0.010	-0.030	**-0.066**	**-0.067**	0.002	-0.051	-0.093	-0.008	-0.030	**0.123**
			-3.847	-0.937	-1.862	**-3.817**	**-3.076**	0.028	-1.747	-1.953	-0.175	-0.379	**11.711**
DEP	1	179.8	**-0.109**	0.009	0.003	**-0.049**	**-0.055**	**-0.066**	-0.019	0.008	-0.001	0.003	**0.219**
			-17.180	1.083	0.334	**-3.560**	**-4.320**	**-7.500**	-1.133	0.429	-0.051	0.167	**12.516**
	2	191.3	**-0.087**	0.005	0.002	**-0.018**	**-0.041**	**-0.049**	-0.007	-0.006	0.005	0.025	**0.195**
			-10.331	0.837	0.191	**-4.489**	**-4.112**	**-5.527**	-0.526	-0.443	0.347	1.936	**14.043**
	3	222.9	**-0.079**	0.003	0.006	**-0.010**	**-0.032**	-0.001	-0.007	-0.006	0.005	-0.024	**0.121**
			-13.219	1.354	1.524	**-2.474**	**-2.474**	-0.023	-0.926	-0.581	0.303	-0.763	**10.637**
SPEC	1	179.8	**0.013**	**-0.009**	**-0.020**	0.004	-0.012	0.014	**0.039**	0.012	**0.047**	0.008	**0.118**
			3.347	**-2.313**	**-3.440**	0.644	-1.318	1.907	**2.693**	1.198	**3.191**	0.640	**6.018**
	2	191.3	0.002	-0.004	-0.001	0.007	**-0.012**	0.010	0.018	-0.002	0.034	0.014	**0.097**
			0.531	-1.047	-0.125	0.590	**-2.069**	0.869	1.974	-0.117	1.897	0.779	**10.305**
	3	222.9	0.006	-0.006	-0.003	0.001	-0.055	0.030	**0.022**	**0.027**	0.068	0.005	**0.083**
			1.611	-1.967	-0.709	0.277	-0.963	0.885	**2.679**	**2.770**	1.139	0.127	**8.894**

Notes. Estimated models are: $X_t/P_{t-1}= \alpha_0+\alpha_1 D_{t,t-1}+\beta_1 PET_{t,t-1}+\beta_2 PET_{t-1,t-2}+\beta_3 PET_{t-2,t-3}+\beta_4 PET_{t-3,t-4}+\gamma_1 D_{t,t-1}PET_{t,t-1}+\gamma_2 D_{t-1,t-2}PET_{t-1,t-2}+\gamma_3 D_{t-2,t-3}PET_{t-2,t-3}+\gamma_4 D_{t-3,t-4}PET_{t-3,t-4}+\varepsilon_t$ where X_t is an undeflated dependent variable listed in the leftmost column of table: *OCF* is operating cash flow, *OP* is adjusted operating profit, *ORD* is earnings before extraordinary and exceptional items, *EARN* is earnings after extraordinary and exceptional items, *ΔWCAP* is working capital accruals, *ΔDebtors* is the change in debtors , *ΔStock* is change in stock, *ΔCreditors* is change in creditors, *DEP* is depreciation and amortisation expense and *SPEC* is special items, $PET_{t,t-1}= (P_t-P_{t-1})/P_{t-1}$ and $D_{t,t-1}=$ {1 if $PET_{t,t-1}\leq 0$; 0 otherwise}. All dependent variables are deflated by opening share price P_{t-1}. *n* is the average number of observations per year. All estimates and R^2s are cross-sectional averages for the period 1969-2001 and associated *t*-statistics are calculated according to the Fama and MacBeth (1973) procedure. Boldfaced estimates are significant at 5% or better at 33–1 = 32 d.f., i.e., $|t|>2.0369$. The opening market capitalisation is re-calculated every year and size tertiles re-formed each year accordingly (the term "opening" refers relative to the balance-sheet date).

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