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Accounting conservatism and the cost of equity capital: UK evidence

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Abstract

Purpose – The purpose of this paper is to investigate the economic consequences of different dimensions of accounting conservatism: *ex ante* (balance sheet or unconditional) conservatism and *ex post* (earnings or conditional) conservatism. It is argued that the two dimensions of conservatism convey different information to the market about the quality of accounting numbers and have different associations with equity investors' required rates of return.

Design/methodology/approach – The cost of equity capital estimates are based on the Ohlson and Juettner-Nauroth model. The paper applies a regression model to examine the relationship between the cost of equity capital and accounting conservatism controlling for other risk factors.

Findings – The findings indicate that *ex ante* conservatism is associated with higher quality of accounting information and lower costs of equity capital and that *ex post* conservatism is associated with lower quality of accounting information and higher costs of equity capital.

Research limitations/implications – The firm-level conservatism measures may suffer from measurement error. Future studies can be more specific in determining proxies for *ex ante* and *ex post* conservatism.

Practical implications – The results imply that conservative accounting signals information to investors about the quality of a firm's current and future earnings. Investors' required rates of returns may be higher for conservative reporting firms that are more susceptible to opportunistic management discretion.

Originality/value – The paper provides the first UK evidence on the effect of different dimensions of conservatism on equity investors' required rates of return.

Keywords Equity capital, Accounting, Accounting information, United Kingdom

Paper type Research paper

1. Introduction

Whether accounting conservatism is a desirable attribute of financial statements is a long-standing issue in the accounting literature. Extensive research has documented evidence of conservative reporting in the USA, the UK and other European countries. Watts (2003a, b) provides several interpretations of the empirical findings of time-series and cross-sectional variation in accounting conservatism based on contracting, litigation, taxation and accounting regulation considerations. In recent empirical research, Penman and Zhang (2002) and Ball and Shivakumar (2005) investigate the effect of accounting conservatism on the quality of reported earnings using different

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approaches, while Francis *et al.* (2003, 2004, 2005) examine the relation between the quality of accounting information and investors' required rates of return. Francis *et al.* (2004) focus on the relation between earnings quality and the cost of equity capital. They view firms with higher degrees of conservatism as higher earnings quality firms, likely to have lower costs of equity capital. However, how the relation between conservatism and the quality of accounting information affects a firm's cost of equity capital remains an empirical issue. We explore this issue further by investigating the effects of different aspects of conservatism on the cost of equity capital. We examine the role of accounting conservatism in financial reporting from an information perspective. We assume that equity investors are the major users of financial statements and that investors are rational in pricing share prices based on available information.

Previous studies identify two types of accounting conservatism: *ex ante* and *ex post* conservatism. *Ex ante* conservatism is accounting-based, balance sheet related, and unconditional or news independent. It reflects the understatement of book values of net assets (primarily due to unrecorded goodwill) and is unrelated to changes in future cash flows. Examples of *ex ante* conservatism include the immediate expensing of R&D and advertising costs, and the accelerated depreciation of long-lived tangible assets. The effect of *ex ante* conservatism on earnings streams may be more persistent and, since investors can evaluate the effects of *ex ante* conservatism on current and future earnings through accounting policy disclosures, more predictable to investors. On the other hand, *ex post* conservatism is market-based, earnings related, and conditional or news dependent. The accounting literature defines *ex post* conservatism in terms of Basu's (1997) interpretation of conservatism as the asymmetric response of earnings to economic gains and losses. *Ex post* conservatism is associated with the more timely recognition of economic losses than gains and may involve a higher degree of managerial discretion as managers can decide the timing and amount of asset write-down or restructuring charges. Thus, the effect of *ex post* conservatism on earnings streams may be less persistent and predictable to investors. We therefore argue that *ex ante* and *ex post* conservatism may convey very different information about the quality[1] of a firm's current and future earnings to the market. Beaver and Ryan (2005) also argue that *ex ante* (unconditional) conservatism constitutes a form of "accounting slack" that pre-empts the application of *ex post* (conditional) conservatism. In other words, *ex ante* conservatism can constrain opportunistic *ex post* conservatism. Thus, we predict that a higher degree of *ex ante* conservatism is associated with good quality earnings and lower costs of equity capital, and that a higher degree of *ex post* conservatism is related to lower quality earnings and higher costs of equity capital.

Our sample consists of all UK non-financial firms during the period 1987-1999. We use the opening book-to-market ratio (B/M) as a proxy for *ex ante* conservatism (e.g. Beaver and Ryan, 2000; Givoly and Hayn, 2000; Pope and Walker, 2003; Givoly *et al.*, 2007; Pae *et al.*, 2005; Roychowdhury and Watts, 2006; Beaver and Ryan, 2005) and the incremental bad news slope coefficient of an augmented earnings–return regression model (e.g. Basu, 1997; Pope and Walker, 1999) as a proxy for *ex post* conservatism. We first apply the Ohlson and Juettner-Nauroth (OJ) model (Ohlson and Juettner-Nauroth (2005)) to infer cost of equity capital estimates. Prior studies show that the OJ model provides good estimates of the cost of equity capital in terms of its relation with share returns. Our empirical results are generally consistent with our predictions that a

higher degree of *ex ante* (*ex post*) conservatism is associated with a lower (higher) cost of equity capital. This finding is robust to:

- using two alternative measures of the cost of equity capital, i.e. the cost of equity capital derived from the price-earnings-growth (PEG) model and one-year-ahead share return; and
- controlling for *ex ante* conservatism when examining *ex post* conservatism.

This study makes two main contributions to the accounting literature. First, most previous studies document the existence of accounting conservatism but largely ignore the economic consequences of conservative accounting. We provide the first empirical evidence on the effect of accounting conservatism on equity investors' required rates of return using UK data. Consistent with our predictions, we find that conservative accounting signals information to investors about the quality of a firm's current and future earnings. Second, we explore the relation between conservatism and the cost of equity capital by considering both *ex ante* and *ex post* conservatism. Consistent with our predictions, we find *ex ante* (*ex post*) conservatism is negatively (positively) associated with the cost of equity capital after controlling for risk factors. Although empirical evidence (e.g. Pope and Walker, 2003; Pae *et al.*, 2005; Beaver *et al.*, 2005) and theoretical models (e.g. Beaver and Ryan, 2005) indicate that *ex ante* and *ex post* conservatism are interrelated, our findings imply that each type of accounting conservatism conveys different information to the market about a firm's reporting policy, financial flexibility, economic position, and quality of future earnings.

The rest of the paper continues as follows. The following section briefly discusses the relation between conservatism, the quality of accounting information, and costs of equity capital. Section 3 provides details of the conservatism measures and costs of equity capital estimates. Section 4 explains our research methods. Details of our data and descriptive statistics on the main variables are in Section 5. Section 6 presents empirical results, and Section 7 concludes.

2. Conservatism, earnings quality and the cost of equity capital

Conservatism has played an important role in financial reporting practice, and has dominated other accounting principles including historical cost and realisation conventions for centuries (Basu, 1997). It has provided a useful and consistent approach to valuing net assets and to measuring earnings under conditions of uncertainty. In the UK, the original concept of conservatism is in Statement of Standard Accounting Practice No. 2 (SSAP2): "Disclosure of Accounting Policies", which describes conservatism as

> . . . revenue and profits are not anticipated, but are recognised by inclusion in the profit and loss account only when realised in the form either of cash or of other assets the ultimate cash realisation of which can be assessed with reasonable certainty; provision is made for all known liabilities (expenses and losses) whether the amount of these is known with certainty or is a best estimate in the light of the information available.

The asymmetric treatment of profits and losses leads to biased financial statements (i.e. an understatement of assets or profits) and has been subject to a number of criticisms. The Accounting Standard Board introduced Financial Reporting Standard No. 18: "Accounting Policies" in 2000. FRS18 superseded SSAP2 and made several changes to accounting standards including accounting for R&D, derivatives and

financial instruments and post-retirement benefits. Conservatism became a characteristic of reliability in FRS18 rather than a fundamental accounting concept. Rejecting excessive conservatism as a desirable characteristic of reliable financial statements, FRS18 states ". . . it is not necessary to exercise prudence where there is no uncertainty. Nor is it appropriate to use prudence as a reason for, for example, creating hidden reserves or excessive provisions, deliberately understating assets or gains, or deliberately overstating liabilities or losses, because that would mean that the financial statements are not neutral and therefore not reliable". Despite conflicts regarding its beneficial role in financial reporting, accounting practice continues to adopt conservatism, viewing it as a cautious and practical convention in dealing with uncertainties and risks inherent in business operations.

There is a lack of consistent evidence in the accounting literature on the effect of accounting conservatism on the quality of earnings. A potential reason for the mixed findings is that previous studies have largely ignored the implications of different types of accounting conservatism for the quality of earnings. Standard textbooks state that accounting conservatism is an important indicator of earnings quality. Supporters of "normative" accounting theory[2] widely believe that a firm with a higher degree of conservatism should be associated with higher quality earnings and therefore a lower cost of capital. Recent empirical evidence, however, does not fully support this view. Givoly and Hayn (2000, 2002) find that earnings conservatism increased in the USA during 1950-1998, contributing to a decline in reported profitability and an increase in earnings dispersion, and coinciding with declining earnings quality (Francis and Schipper, 1999; Barth *et al.*, 1998; Collins *et al.*, 1997). Penman and Zhang (2002) examine the effect of the interaction between conservatism and changes in investments on the quality of earnings. They find that when a company practices conservative accounting and its change in investments is temporary, current earnings are depressed or inflated and therefore are not a good indicator of future earnings. Thus, conservative accounting practice may not necessarily lead to good quality earnings, measured by earnings persistence and predictability.

Francis *et al.* (2004) examine the relation between the quality of accounting information, measured by several different accounting-based and market-based earnings attributes, and measures of the cost of equity capital. Accounting-based attributes include earnings quality, persistence, predictability and smoothness, while market-based attributes include relevance, timeliness, and conservatism[3]. Conservatism is the incremental response of earnings to bad news in Basu's earnings–return regression model. Francis *et al.* (2004) assume that conservatism is related to good quality earnings. They find that accounting-based (market-based) attributes have a greater effect on costs of equity capital than do market-based (accounting-based) attributes when using univariate (multivariate) analysis. These findings support the theoretical model of Easley *et al.* (2002), indicating that earnings quality is a non-diversifiable risk priced by investors[4]. Interestingly, they find the Basu conservatism measure is never associated with costs of equity capital after controlling for risk proxies, other earnings attributes and innate determinants of earnings attributes. This could be caused by the fact that *ex post* conservatism is highly correlated with other risk factors and earnings attributes.

Other studies such as Beekes *et al.* (2004) argue that *ex post* conservatism may be associated with lower quality earnings due to managers' opportunistic behaviour. Instead of using the market-based conservatism measure suggested by Basu (1997), Cheng and Liu (2006) examine the value-relevance of earnings for conservative and

non-conservative firms using total accruals, working capital and non-operating accruals as proxies for accounting conservatism. They find that conservative firms have lower earnings response coefficients than non-conservative firms due to the fact that conservative firms have lower quality accruals and less smooth earnings streams than non-conservative firms. They also find that the market responds more negatively to firms with extreme accounting conservatism.

Watts (2003a) argues that evidence of opportunistic managerial behaviour such as excessive asset write-downs and contingent losses cannot fully explain the role of conservatism in financial reporting. The intention of prudent reporting is to offset managers' tendency to overstate net assets or earnings. From a contracting perspective, accounting conservatism is an important attribute for improving the efficiency of debt and other contracts. Conservative accounting helps in monitoring managers' performance and improves the quality of accounting information for contracting purposes. In compensation contracts, conservative reporting is likely to reduce the possibility of managers managing earnings to increase their own utility at the expense of other stakeholders in the firm. In relation to debt covenants, conservatism reduces the likelihood of reporting overestimated earnings and assets or overpaying dividends to shareholders. From an information perspective, conservative accounting provides signals to investors about current and future firm performance. Not only do non-equity investors demand conservative accounting, but also equity investors may benefit from accounting conservatism in spite of possibly biased financial statements resulting from conservative reporting. Watts (2003a) argues that conservative accounting numbers are also relevant to equity investors under the abandonment option hypothesis. Shareholders have an abandonment option to liquidate the firm's assets, which they can exercise when firm value falls below the liquidation value of net assets. The existence of an abandonment option gives rise to a demand from equity investors for a conservative balance sheet.

We argue that different aspects of conservative accounting may convey different information to the market about a firm's future performance. We examine whether investors price different dimensions of conservatism differently. Our purpose is to evaluate the economic consequences of conservative accounting from an information perspective. We assume that equity investors are the major users of financial statements and that investors are rational in valuing securities using the information available to them. We argue that *ex ante* and *ex post* conservatism relate in different ways to earnings properties[5] and the cost of equity capital. A more *ex ante* conservative firm is likely to provide more reliable information to equity investors for investment decisions. *Ex ante* conservative accounting practices are associated with less uncertainty about future cash flows, and investors may be able to identify and analyze their impact on a firm's current and future earnings. Thus, we argue that the quality of earnings and accounting information provided in the financial statements is higher from an information perspective for firms that apply greater *ex ante* conservatism. We therefore predict that these firms have lower costs of equity capital. In contrast, the timing and amount of *ex post* conservative accounting are more susceptible to opportunistic management discretion. Examples include big-bath accounting and excessive provisions for reserves. This may impair the reliability of reported accounting numbers, resulting in lower quality earnings and accounting information and therefore higher costs of equity capital.

3. Conservatism measures and costs of equity capital estimates

3.1 Ex ante and ex post conservatism measures

Our definition of *ex ante* conservatism corresponds to the concept in Feltham and Ohlson (1995). Accounting is conservative (biased) if

$$\lim_{\tau \to \infty} \frac{E_t[\mathrm{oa}_{t+\tau}]}{E_t[\mathrm{MV}_{t+\tau}]} < 1, \tag{1}$$

where $\mathrm{oa}_{t+\tau}$ is the book value of operating assets and $\mathrm{MV}_{t+\tau}$ is the market value of operating assets. Companies understate book values of operating assets relative to their economic values by applying higher accounting amortization or depreciation rates. Extreme cases in practice are the immediate expensing of R&D and advertising expenditures. Following previous studies (Beaver and Ryan, 2000; Pope and Walker, 2003; Givoly *et al.*, 2007; Pae *et al.*, 2005; Roychowdhury and Watts, 2006; Beaver and Ryan, 2005), we use the opening *B/M* ratio as a proxy for *ex ante* conservatism. Our results provide basic evidence on the relation between conservative accounting book values and equity investors' required rates of returns.

The negative value of the incremental bad news slope coefficient ($-\beta_1$) of an augmented earnings–return regression measures the level of *ex post* conservatism. The earnings–return regression is

$$\frac{X_{it}}{P_{it-1}} = \alpha_0 + \alpha_1 D_{it} + \beta_0 (R_{it} - R_{mt}) + \beta_1 (R_{it} - R_{mt}) D_{it} + u_{it}, \tag{2}$$

where X_{it} is earnings per share of firm i in year t, P_{it-1} is the share price of firm i at the end of year t–1 and D_{it} is a dummy variable for firm i in year t that takes the value one if the company-specific share return ($R_{it} - R_{mt}$) is negative and zero otherwise. R_{it} is the continuously compounded return of firm i in year t calculated from nine months before to three months after the fiscal year-end and R_{mt} is the corresponding market return. We use the sign of market-adjusted share returns as a proxy for economic gains and losses. We run time-series regressions for each firm, based on Equation (2). The degree of *ex post* conservatism depends on the extent to which reported earnings contemporaneously recognise value-relevant news. The coefficient β_0 measures the earnings response to economic gains (good news), while β_1 captures the incremental response of earnings to economic losses (bad news). We use a ten-year rolling regression method (i.e. the estimate of β_1 of company i in year 1999 is based on a time-series regression covering 1990-1999). Each company has an *ex post* conservatism measure in each year.

3.2 The cost of equity capital estimate

We adopt the OJ, 2005 model to measure a firm's cost of equity capital. The reason for using the OJ model is because it requires fewer accounting input variables compared to other equity valuation models and recent empirical research by Gode and Mohanram (2003) shows that the OJ model provides a good estimate of the cost of equity capital.

The main feature of the OJ model is that it introduces the expected earnings per share series into firm valuation. The model's assumptions are as follows.

Assumption 1: Current share price equals the present value of expected dividend per share (dps)

$$P_0 = \sum_{t=1}^{\infty} \frac{\text{dps}_t}{(1 + r_e)} \tag{3}$$

where P_0 is current share price, dps_t is expected dividend per share in period t and r_e is the cost of equity capital. The OJ model relates price to one-year-ahead earnings and earnings growth

$$P_0 = \frac{\text{eps}_1}{r} + \sum_{t=1}^{\infty} \frac{Z_t}{(1 + r_e)} \tag{4}$$

and

$$Z_t = \frac{1}{r_e}\{\text{eps}_{t+1} - [(1 + r_e) * \text{eps}_t - r_e * \text{dps}_t]\}, \tag{5}$$

where eps_t is expected earnings per share in period t and Z_t denotes the valuation premium. The term $[(1 + r_e) * \text{eps}_t - r_e * \text{dps}_t]$ represents the benchmark for expected eps_{t+1}. A zero value of Z_t implies normal earnings performance. A positive value of Z_t implies superior eps performance measured by the change in eps adjusted for earnings retention.

Assumption 2: The sequence $\{Z_t\}_{t+1}^{\infty}$ satisfies $Z_{t+1} = \gamma\, Z_t$, $t = 1, 2, 3, \ldots$; where $1 \leq \gamma \leq (1 + r_e)$ and $Z_1 > 0$.

Assumption 2 implies that $(\text{eps}_t/\text{eps}_{t-1}) \to \gamma$ as $t \to \infty$, where γ is the long-term earnings growth rate. This is a necessary condition to derive a P_0/eps_1 ratio that depends only on two (short-term and long-term) earnings growth parameters and the cost of equity capital. However, it means that estimated costs of equity capital derived from the OJ model may be more accurate for some firms, for example mature firms and firms with steady earnings growth, than for others, for example firms with large R&D investments. The latter firms may incur large losses in early years before they achieve above normal earnings performance ($Z > 0$).

Assumptions 1 and 2 lead to the following pricing equation

$$P_0 = \frac{\text{eps}_1}{r_e} + \frac{Z_1}{(1 + r_e) - \gamma}, \tag{6}$$

where $Z_1 = (1/r_e)[\text{eps}_2 + r_e * \text{dps}_1 - (1 + r_e) * \text{eps}_1]$. Since there is a correction for earnings foregone due to dividend payouts, Equation (6) places no restriction on dividend payout policy.

The formulas for the implied cost of equity capital-based on the OJ model are as follows.

$$r_e = A + \sqrt{A^2 + \frac{\text{eps}_1}{P_0}[g_2 - (\gamma - 1)]}, \tag{7}$$

where $A = 1/2[\gamma - 1 + (\text{dps}_1/P_0)]$ and $g_2 = \Delta\text{eps}_2/\text{eps}_1$.

The implied cost of equity capital is a function of the dividend yield, the earnings yield, and a long-term earnings growth rate.

To implement the OJ model empirically, we make the following choices. We assume the one-year-ahead dividend payout ratio equals the current year dividend payout ratio. We assume the UK government ten-year bond yield is free from credit risk and proxies the long-term risk-free rate in the OJ model. The model assumes the short-term earnings growth rate decays to a perpetual growth rate in the long run. We measure the short-term earnings growth rate (g_2) by the change in two-year-ahead forecast earnings divided by one-year-ahead forecast earnings ($g_2 = \Delta\text{eps}_2/\text{eps}_1$). To make model applications simple, we assume the perpetual earnings growth rate (γ) is the same for every company in each year. Although this assumption may be problematic, it does not substantially affect the interpretation of the empirical results of the relation between costs of equity capital and accounting conservatism in this study because measurement errors in estimating costs of equity capital appear in the error term of the regression. We set the perpetual growth rate equal to the nominal risk-free rate minus 3 per cent to reflect the effect of inflation[6].

4. Applying the model to investigate the relation between conservatism and costs of equity capital

We use the following model to test the relation between accounting conservatism and the cost of equity capital controlling for other risk factors

$$\begin{aligned}\text{COST}_{it} = {} & \alpha_0 + \alpha_1\text{BETA}_{it} + \alpha_2\text{LEV}_{it} + \alpha_3\text{SIZE}_{it} + \alpha_4\text{EVAR}_{it} \\ & + \alpha_5\text{CON\_RANK}_{it} + \varepsilon_{it},\end{aligned} \tag{8}$$

where COST_{it} is the estimated cost of equity capital of firm i in year t based on the OJ model. BETA_{it} is firm i's capital asset pricing model (CAPM) beta in year t. We require a minimum of 24 monthly returns for each firm and use a ten-year rolling window to calculate the CAPM beta for each firm-year. LEV_{it} is the leverage of firm i in year t measured by the debt-to-equity ratio, SIZE_{it} is the natural logarithm of equity market value of firm i at the end of year t, and EVAR_{it} is the variability of reported earnings of firm i in year t estimated by the coefficient of variation using a ten-year rolling window. We predict a positive relation between the cost of equity and the risk factors beta, leverage, and earnings variability and a negative relation between the cost of equity and firm size. CON_RANK_{it} denotes the decile rank of the conservatism measure of firm i in year t.

As the conservatism measures used in the present study may be subject to measurement error, we rank firms based on each conservatism measure (*ex ante* or *ex post*) into deciles in each year to reduce the effect. Firms in the first decile (R1) have the smallest values of conservatism. That is, firms in R1 are more *ex ante* or *ex post* conservative. Firms in the last decile (R10) have the largest values of conservatism and are firms with the lowest degrees of *ex ante* or *ex post* conservatism. We predict that α_5 in Equation (8), interpreted as the incremental cost of equity capital across adjacent deciles, is positive for *ex ante* conservatism, and negative for *ex post* conservatism. In addition, we report results using raw conservatism values to show the average effect of conservatism on the cost of equity capital.

5. Data collection and descriptive statistics

The sample includes UK non-financial firms during the period 1987-1999 with earnings forecast data available on I/B/E/S. Earnings forecast data and analyst following are from I/B/E/S. We use the median values of earnings forecasts in each year

to estimate the cost of equity capital, and collect other accounting variables such as current earnings per share, dps, market value of equity and book value of equity from Datastream. We exclude firm-year observation with missing information on reported earnings, share return, and one-year-ahead and two-year-ahead earnings forecasts. The original sample includes 1,149 firms and 6,790 firm-year observations. However, we impose several deletion criteria in order to provide reliable results on the relation between conservatism and the cost of equity capital. To increase the reliability of the estimated cost of equity capital inferred from the OJ model, we delete negative median values of one-year-ahead and two-years-ahead earnings forecasts, and negative dividend yields. After applying these deletion criteria and excluding firms with missing estimated costs of equity capital[7], the final sample comprises 1,012 firms and 5,403 firm-year observations.

To estimate the risk factors required by our model, we collect share return data from the LSPD and use the FTSE All-Share Index as a proxy for the market and the one-month treasury bill discount rate collected from Datastream as a proxy for the risk-free rate for estimating the CAPM beta. Earnings are before exceptional and extraordinary items (Datastream item 182). We measure earnings variability as the coefficient of variation in reported earnings (standard deviation (SD) scaled by mean value). To be consistent with the estimated CAPM beta and the *ex post* conservatism measure, we use a ten-year rolling window to calculate the variability of earnings. We measure size by the natural logarithm of equity market value and dividend payout ratio by dps divided by earnings per share. We estimate leverage by the debt-to-equity ratio, total debt by total assets (Datastream item 392) minus book value of equity (Datastream item 307 plus item 315), and sales growth by the percentage change in current sales (Datastream item 104).

Table I presents descriptive statistics for the main variables in the study. The mean and median values of earnings before exceptional and extraordinary items are 0.15 and 0.12, and the earnings figure is positively skewed. Both the cost of equity capital and the risk premium are positively skewed, indicating that there are extreme positive values of the estimated costs of equity capital and risk premiums. The median cost of equity capital is 14.78 per cent. The median value of the risk premium is 6.45 per cent. Over the whole sample period, approximately 5.3 per cent of firms have estimated costs of equity capital lower than the ten-year government-bond yield. The median value of the *ex post* conservatism measure is zero, and 33.19 per cent of β_1s in the sample are negative[8].

Table II reports yearly median values of the cost of equity capital, risk premium and input variables of the OJ model. There is no particular trend in the earnings yield, dividend yield and the short-term growth rate, while the long-term earnings growth rate decreases over the sample period. The cost of equity capital shows a slightly decreasing trend, while the risk premium remains stable[9].

Table III reports Spearman and Pearson correlations. To control for extreme values, we winsorize all variables except for the number of analysts at the top and bottom 1 per cent. The results show that the cost of equity capital and the risk premium are positively correlated with earnings variability, leverage, and B/M, and negatively correlated with analyst following, firm size, and sales growth. The CAPM beta is generally not significantly correlated with the cost of equity capital (risk premium), but is significantly correlated with other factors such as firm size, earnings variability, and sales growth. We do not include analyst following and sales growth in Equation (8) as they are highly correlated with firm size. Consistent with Pope and Walker (2003), there

Table I.
Descriptive statistics

	EARN	LEV	SIZE	No. of analysts	EVAR	B/M	r_e	r_p	BETA	Salesgrowth	$-\beta_1$
No. of obs.	5,403	5,403	5,403	5,403	5,403	5,403	5,403	5,403	5,403	5,403	5,403
Mean	0.15	1.39	11.27	17.56	1.08	0.69	16.31	8.05	0.98	0.48	0.03
Q1	0.06	0.68	10.15	4	0.33	0.33	12.07	3.94	1.00	−0.02	−0.02
Median	0.12	1.05	11.12	10	0.54	0.52	14.78	6.45	1.00	0.10	0.00
Q3	0.19	1.56	12.16	23	0.91	0.81	18.18	9.99	1.01	0.25	0.07
Std	0.17	6.43	1.61	19.60	24.51	1.15	11.67	11.68	0.19	4.74	1.61
Max	4.03	394.64	18.00	141	1507.23	37.59	569.02	560.48	3.76	160.17	86.48
99th percentile	0.61	6.14	15.82	88	12.25	3.06	42.68	34.10	1.44	6.89	1.81
Min	−0.18	−67.97	6.46	1	−510.66	−0.76	3.22	−6.46	−1.10	−1.00	−23.85
First percentile	0.01	0.17	8.27	1	−10.71	0.03	6.68	−2.02	0.15	−0.96	−2.22
Skewness	9.31	46.04	0.65	1.96	41.80	19.63	24.78	24.70	−2.37	22.01	28.62

Notes: The table reports descriptive statistics for the main variables in the study. Variables for each firm are measured at the end of December each year from 1987 to 1999. EARN is earnings before extraordinary and exceptional items divided by the number of shares. LEV is the debt-to-equity ratio. SIZE is the natural logarithm of the market value of equity. No. of analysts is the number of analysts whose forecasts are included in I/B/E/S. EVAR is earnings variability measured by the SD of earnings divided by the average reported earnings using a ten-year rolling window. *B/M* is the ratio of opening book to market value of equity. r_e is the implied cost of equity capital from the OJ model. r_p is the risk premium measured by the implied cost of equity capital minus the risk-free rate (UK Bond Yield Govt. 10Y). BETA is the CAPM beta using a ten-year rolling window. Salesgrowth is growth in sales measured by the change in sales divided by prior year sales. $-\beta_1$ is the negative value of the coefficient on the bad news slope dummy of the augmented earnings–return regression

Year	No. of obs.	r_e	r_p	$\gamma - 1$	dps_1/p_0	eps_1/p_0	g_2	A
1987	384	15.47	5.33	7.14	2.87	8.20	16.90	5.00
1988	395	15.61	6.19	6.42	3.39	9.51	16.60	4.90
1989	357	14.43	5.12	6.31	3.27	8.64	14.36	4.64
1990	362	16.42	5.86	7.56	3.44	8.79	15.92	5.50
1991	404	16.20	6.04	7.16	3.38	7.08	19.17	5.27
1992	399	15.80	6.56	6.24	3.59	7.23	18.97	4.91
1993	424	14.83	6.29	5.54	3.33	7.25	17.79	4.43
1994	448	13.73	7.38	3.35	3.19	6.64	16.48	3.27
1995	468	14.63	6.07	5.56	3.43	7.00	15.40	4.50
1996	519	14.07	6.65	4.42	3.23	7.74	15.43	3.82
1997	497	13.88	6.35	4.53	3.30	7.31	14.35	3.92
1998	437	14.89	7.42	3.11	3.44	8.03	12.90	3.28
1999	309	13.53	9.49	1.19	3.84	8.38	13.94	2.52
Average	416	14.79	6.52	5.27	3.34	7.98	16.02	4.31

Notes: r_e is the cost of equity capital measured by $r_e = A + \sqrt{A^2 + (eps_1/P_0)(g_2 - (\gamma - 1))}$, where $A = 1/2[(\gamma - 1) + (dps_1/P_0)]$ and $g_2 = \Delta eps_2/eps_1$; g_2 is the short-term earnings growth rate; γ is the long-term earnings growth rate; dps_1/P_0 and eps_1/P_0 are one-year-ahead dividend yield and earnings yield, and r_p is the risk premium measured by the implied cost of capital minus the risk-free rate (UK Bond Yield Govt. 10Y)

Table II.
Yearly median values of the implied cost of equity capital inferred from the OJ model

is a negative correlation between *ex ante* and *ex post* conservatism measures although this is not statistically significant.

6. Empirical results

6.1 Results of ordinary least squares (OLS) regressions

6.1.1 Ex ante conservatism. Table IV reports the relation between *ex ante* conservatism and the cost of equity capital. The coefficient on conservatism ranks gives the incremental cost of equity capital associated with adjacent deciles. The results show that the explanatory power of the regression is higher in the regression including conservatism ranks (19.51 per cent) than in the regression excluding conservatism ranks (18.00 per cent). Similar to the results of the pair-wise correlations in Table III, the cost of equity capital is positively related to leverage and negatively related to firm size. Earnings variability is positive but insignificant; this may be due to the significant correlation between earnings variability and firm size (Table III). We do not include sales growth as an additional explanatory variable as it lowers the adjusted R^2 and the coefficient on sales growth is insignificant. This may be due to the significant correlation between sales growth and other controlled risk factors: firm size, leverage, and *B*/*M* (see Table III). The coefficient on conservatism rank (α_5) is positive and highly significant (0.27, $t = 10.21$), indicating that lower *ex ante* conservative firms have higher costs of equity capital. The cost of equity capital increases by 27 basis points (bp) among adjacent deciles, and there is a spread of 243 bp between firms with the highest and lowest degrees of *ex ante* conservatism. Using risk premium as the dependent variable provides similar results. The risk premium is positively related to leverage and negatively related to firm size. A firm with a higher degree of *ex ante* conservatism is associated with a lower risk premium. Panel B uses the raw values of the *ex ante* conservatism measure as the explanatory variable to examine the average effect of conservatism on the cost of equity capital. The coefficient on *B*/*M* is

Table III.
Univariate correlations between variables

	r_e	r_p	BETA	EVAR	No. of analysts	SIZE	LEV	Salesgrowth	*B/M*	$-\beta_1$
No. of observations = 5,403										
r_e		**0.961**	−0.004	*0.029*	**−0.226**	**−0.413**	**0.103**	**−0.061**	**0.171**	*−0.024*
r_p	**0.919**		−0.013	*0.027*	**−0.236**	**−0.383**	**0.108**	**−0.066**	**0.151**	−0.014
BETA	0.021	*0.025*		*0.031*	*0.031*	*0.029*	*−0.028*	**−0.004**	0.012	0.011
EVAR	**0.143**	**0.104**	**0.171**		0.008	−0.005	−0.010	−0.002	**0.041**	0.016
No. of analysts	**−0.268**	**−0.283**	−0.021	*0.023*		**0.724**	−0.004	**0.070**	**−0.112**	*−0.024*
SIZE	**−0.449**	**−0.411**	**−0.033**	*−0.025*	**0.721**		−0.016	**0.161**	**−0.236**	−0.021
LEV	**0.165**	**0.163**	0.016	**0.106**	*0.038*	−0.017		**0.104**	**−0.140**	−0.020
Salesgrowth	**−0.150**	**−0.148**	*0.029*	0.016	**0.114**	**0.195**	**0.144**		−0.011	0.004
B/M	**0.208**	**0.170**	**0.051**	**0.084**	**−0.157**	**−0.252**	**−0.162**	**−0.194**		0.002
$-\beta_1$	−0.008	0.004	0.017	0.010	−0.022	*−0.027*	**−0.040**	−0.018	*0.028*	

Notes: Pearson (Spearman) correlations are above (below) the diagonal. r_e is the implied cost of equity capital inferred from the OJ model. r_p is the risk premium measured by the implied cost of equity capital minus the risk-free rate (UK Bond Yield Govt. 10Y). BETA is the CAPM beta using a ten-year rolling window. EVAR is earnings variability measured by the SD of earnings divided by the average reported earnings using a ten-year rolling window. No. of analysts is the number of analysts whose forecasts are included in I/B/E/S. SIZE is the natural logarithm of the market value of equity. LEV is the debt-to-equity ratio. Salesgrowth is growth in sales measured by the change in sales divided by prior year sales. *B/M* is the ratio of opening book to market value of equity. $-\beta_1$ is the negative value of the coefficient on the bad news slope dummy of the augmented earnings–return regression. We winsorize all variables at the top and bottom 1 per cent, except for number of analysts. Numbers in bold indicate significance at a 1 per cent confidence level, and numbers in italics denote significance at a 10 per cent confidence level

No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	Adjusted R^2(%)
Panel A1: Using conservatism ranks as the independent variable and the cost of equity capital as the dependent variable							
5,403	32.11	0.37	0.61	−1.54	0.07		18.00
	(44.53)	(0.83)	(7.88)	(−34.44)	(1.57)		
5,403	29.51	0.27	0.75	−1.42	0.06	0.27	19.51
	(38.10)	(0.61)	(8.96)	(−28.40)	(1.46)	(10.21)	
Panel A2: Using conservatism ranks as the independent variable and the risk premium as the dependent variable							
5,403	22.89	0.01	0.64	−1.43	0.07		15.70
	(31.15)	(0.02)	(7.65)	(−29.19)	(1.70)		
5,403	20.67	−0.07	0.76	−1.33	0.05	0.23	16.81
	(27.38)	(−0.16)	(9.08)	(−27.15)	(1.21)	(8.69)	
Panel B1: Using raw values of conservatism as the independent variable and the cost of equity capital as the dependent variable							
No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	*B/M*	Adjusted R^2(%)
5,403	30.38	0.32	0.69	−1.46	0.06	1.14	18.80
	(40.60)	(0.72)	(8.56)	(−29.20)	(1.45)	(5.92)	
Panel B2: Using raw values of conservatism as the independent variable and the risk premium as the dependent variable							
5,403	21.41	−0.04	0.71	−1.35	0.06	0.98	16.28
	(28.11)	(−0.09)	(8.49)	(−27.00)	(1.46)	(5.90)	

Notes: The table reports the results of running the pooled regressions

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \varepsilon_{it}$$

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 B/M_{it} + \varepsilon_{it},$$

where COST_{it} is either the cost of equity capital or the risk premium, BETA_{it} is the CAPM beta using a ten-year rolling window; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is the SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex ante* conservatism measure; $\mathrm{B/M}_{it}$ is the ratio of opening book to market value of equity. All variables are winsorized at the top and bottom 1 per cent. White (1980) heteroskedasticity-consistent *t*-statistics are in parentheses

Table IV.
The relation between *ex ante* conservatism and the cost of equity capital

significantly positive (1.14, $t = 5.92$ and 0.98, $t = 5.90$). The results imply that after controlling for other risk factors, a 1 per cent increase in *B/M* is associated with a 1.14 bp increase in the cost of equity capital, and that the effect of *ex ante* conservatism on the cost of equity capital is on average 78 bp (1.14 × 0.69).

In Table V, we report the results of Fama and MacBeth (1973) annual cross-sectional regressions as a robustness check. The average values of the coefficients across the sample period are divided by the time-series standard errors to compute the *t*-values. The coefficients on *ex ante* conservatism rank are positive and significant except for the first three years of the sample period. The average value of the coefficient on CON_RANK is significantly positive (0.24, $t = 6.45$) and similar in magnitude to the value obtained from the pooled regression (0.27). Leverage and firm size are significantly related to the cost of equity capital in most years. The average adjusted R^2 is 18.80 per cent.

Year	No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	Adjusted R^2(%)
1987	384	32.99	−2.75	0.38	−1.30	−0.14	0.10	13.08
		(10.55)	(−1.45)	(1.27)	(−6.95)	(−1.48)	(1.06)	
1988	395	27.98	−0.22	0.58	−1.08	0.14	−0.08	9.41
		(7.76)	(−0.09)	(1.97)	(−6.23	(0.99)	(−0.96)	
1989	357	14.54	7.55	0.56	−0.74	−0.03	0.10	5.77
		(3.64)	(1.89)	(2.29)	(−3.70)	(−0.21)	(1.14)	
1990	362	29.75	1.98	0.76	−1.48	0.14	0.28	13.09
		(10.52)	(1.13)	(2.19)	(−5.94)	(0.62)	(2.29)	
1991	404	29.75	0.36	0.94	−1.41	0.13	0.43	15.84
		(8.58)	(0.14)	(2.35)	(−6.31)	(0.75)	(3.40)	
1992	399	31.79	0.84	1.67	−1.68	0.24	0.30	24.43
		(7.49)	(0.21)	(3.73)	(−9.70)	(1.70)	(2.63)	
1993	424	30.19	−1.83	0.82	−1.29	−0.18	0.33	20.45
		(5.92)	(−0.42)	(2.90)	(−7.58)	(−1.04)	(3.94)	
1994	448	25.25	−3.23	1.11	−0.90	0.10	0.35	16.56
		(8.90)	(−1.66)	(3.55)	(−6.36)	(1.20)	(3.96)	
1995	468	28.16	−2.16	0.70	−1.09	0.17	0.20	15.46
		(11.69)	(−1.37)	(2.59)	(−8.12)	(1.20)	(2.58)	
1996	519	29.42	−0.01	0.64	−1.42	0.06	0.27	25.35
		(18.68)	(−0.01)	(2.86)	(−12.45)	(0.60)	(3.82)	
1997	497	31.06	0.81	0.71	−1.64	−0.14	0.24	26.27
		(13.89)	(0.83)	(3.55)	(−9.80)	(−1.18)	(3.10)	
1998	437	32.11	0.28	0.79	−1.77	0.28	0.34	31.27
		(14.52)	(0.27)	(3.95)	(−11.67)	(2.18)	(3.40)	
1999	309	31.80	4.30	0.72	−1.96	0.07	0.24	27.41
		(8.60)	(1.36)	(2.72)	(−9.80)	(0.23)	(1.79)	
Average		28.83	0.46	0.80	−1.36	0.06	0.24	18.80
		(21.81)	(0.56)	(9.09)	(−13.95)	(1.55)	(6.45)	

Notes: The table reports the results of running the year-by-year regression

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \varepsilon_{it}$$

where COST_{it} is either the cost of equity capital or the risk premium, BETA_{it} is the CAPM beta using a ten-year rolling window; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is the SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex ante* conservatism measure. All variables are winsorized at the top and bottom 1 per cent. *t*-statistics are in parentheses

Table V.
The results of annual cross-sectional regressions: *ex ante* conservatism

6.1.2 Ex post conservatism. Table VI reports the relation between *ex post* conservatism and the cost of equity capital, or the risk premium. Panel A uses *ex post* conservatism rank as the independent variable. The adjusted R^2's (18.09 and 15.74 per cent) are lower than for *ex ante* conservatism. The coefficients on *ex post* conservatism rank are significantly negative in the cost of equity capital regression (−0.07, $t = -2.48$). The results imply that after controlling for other risk factors, more *ex post* conservative firms are associated with higher costs of equity capital (risk premiums) and that there is 63 bp difference between the two extreme *ex post* conservative firms. Panel B reports the results using raw values of *ex post* conservatism, which lead to the

No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	Adjusted R^2(%)
Panel A1: Using conservatism ranks as the independent variable and the cost of equity capital as the dependent variable							
5,403	32.44	0.40	0.60	−1.54	0.07	−0.07	18.09
	(43.74)	(0.89)	(7.75)	(−34.43)	(1.70)	(−2.48)	
Panel A2: Using conservatism ranks as the independent variable and the risk premium as the dependent variable							
5,403	23.13	0.03	0.63	−1.43	0.07	−0.05	15.74
	(30.70)	(0.07)	(7.53)	(−31.98)	(1.70)	(−1.77)	
Panel B1: Using raw values of conservatism as the independent variable and the cost of equity capital as the dependent variable							
No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	$-\beta_1$	Adjusted R^2(%)
5,403	32.13	0.38	0.60	−1.55	0.07	−0.43	18.08
	(45.44)	(0.85)	(7.75)	(−31.64)	(1.70)	(−2.30)	
Panel B2: Using the raw values of conservatism as the independent variable and the risk premium as the dependent variable							
5,403	22.91	0.02	0.64	−1.43	0.07	−0.29	15.72
	(31.18)	(0.04)	(7.65)	(−29.19)	(1.57)	(−1.67)	

Notes: The table reports the results of running the pooled regressions

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \varepsilon_{it}$$

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 (-\beta_1)_{it} + \varepsilon_{it},$$

where COST_{it} is either the cost of equity capital or the risk premium, BETA_{it} is the CAPM beta using a ten-year rolling window; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex post* conservatism measure. $-\beta_1$ is the negative value of the coefficient on the bad news slope dummy of the augmented earnings–return regression. All variables are winsorized at the top and bottom 1 per cent. White (1980) heteroskedasticity-consistent *t*-statistics are in parentheses

Table VI.
The relation between *ex post* conservatism and the cost of equity capital

same conclusions that there is a significant increase in the cost of equity capital for higher *ex post* conservative firms.

Many studies (Pope and Walker, 2003; Pae *et al.*, 2005; Beaver and Ryan, 2005) find that *ex ante* and *ex post* conservatism are interrelated. They also argue that the empirical evidence on *ex post* conservatism without controlling for *ex ante* conservatism is biased because *ex ante* conservatism pre-empts opportunistic *ex post* conservatism. As a result, we provide empirical results for *ex post* conservatism after controlling for opening book-to-market value ratio. Table VII shows results consistent with Table VI, indicating that *ex post* conservatism is negatively associated with the cost of equity capital even after controlling for *ex ante* accounting conservatism.

Table VIII reports annual cross-sectional regression results for *ex post* conservatism. The coefficient on *ex post* conservatism is significantly negative in 1994 and 1998. The average value of the *ex post* conservatism coefficient is significantly negative (-0.06, $t = -2.14$), consistent with the pooled regression results. The average values for BETA and EVAR are insignificant and for leverage and firm size are

No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	*B/M*	Adjusted R^2(%)
Panel A1: Using conservatism ranks as the independent variable and the cost of equity capital as the dependent variable								
5,403	30.72	0.35	0.69	−1.46	0.06	−0.07	1.14	18.90
	(39.99)	(0.79)	(8.56)	(− 29.20)	(1.46)	(−2.65)	(5.93)	
Panel A2: Using conservatism ranks as the independent variable and the risk premium as the dependent variable								
5,403	21.65	−0.01	0.71	−1.36	0.06	−0.65	0.98	16.33
	(27.95)	(−0.02)	(8.49)	(−27.20)	(1.46)	(−1.77)	(5.03)	
Panel B1: Using raw values of conservatism as the independent variable and the cost of equity capital as the dependent variable								
No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	$-\beta_1$	*B/M*	Adjusted R^2(%)
5,403	30.41	0.33	0.69	−1.46	0.06	−0.42	1.13	18.88
	(40.64)	(0.74)	(8.91)	(−29.20)	(1.46)	(−2.25)	(5.88)	
Panel B2: Using the raw values of conservatism as the independent variable and the risk premium as the dependent variable								
5,403	21.43	−0.03	0.71	−1.36	0.06	−0.28	0.97	16.31
	(28.14)	(−0.07)	(8.48)	(−27.20)	(1.44)	(−1.48)	(4.98)	

Notes: The table reports the results of running the pooled regressions

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \alpha_6 B/M_{it} + \varepsilon_{it}$$

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 (-\beta_1)_{it} + \alpha_6 B/M_{it} + \varepsilon_{it},$$

where COST_{it} is either the cost of equity capital or the risk premium, BETA_{it} is the CAPM beta using a ten-year rolling window; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex post* conservatism measure. $-\beta_1$ is the negative value of the coefficient on the bad news slope dummy of the augmented earnings–return regression. $\mathrm{B/M}_{it}$ is the ratio of opening book to market value of equity. All variables are winsorized at the top and bottom 1 per cent. White (1980) heteroskedasticity-consistent *t*-statistics are in parentheses

Table VII.
The relation between *ex post* conservatism and the cost of equity capital, conditional on *ex ante* conservatism

statistically significant. The average adjusted R^2 is 17.58 per cent, lower than for the pooled regression results.

The evidence presented in Tables IV-VIII supports our predictions on the relation between equity investors' required rates of return and different conservative accounting dimensions. Our results based on OLS regressions suggest that *ex ante* conservatism is negatively related to the cost of equity capital and that *ex post* conservatism is positively associated with the cost of equity capital after controlling for CAPM beta, leverage, firm size and earnings variability. *Ex ante* conservative accounting provides more accurate information to the market as investors are able to understand its effect on a firm's current and future reported earnings, resulting in good quality of accounting numbers in the financial statements and lower costs of equity capital. In contrast, *ex post* conservatism involves a higher degree of opportunistic management discretion as managers have the choice to determine the timing and amount of future possible economic gains or losses. This may results in lower earnings quality from an information perspective and higher investors' required rate of returns.

Year	No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	Adjusted R^2(%)
1987	384	34.23	−2.76	0.39	−1.30	−0.13	−0.18	13.48
		(10.84)	(−1.43)	(1.30)	(−6.95)	(−1.25)	(−1.57)	
1988	395	27.18	0.07	0.63	−1.05	0.14	−0.04	9.29
		(7.85)	(0.03)	(2.24)	(−6.06)	(0.96)	(−0.40)	
1989	357	14.94	7.13	0.53	−0.75	−0.05	0.15	6.17
		(3.74)	(1.84)	(2.20)	(−3.85)	(−0.31)	(1.43)	
1990	362	32.18	2.22	0.55	−1.56	0.19	−0.05	11.83
		(11.38)	(1.29)	(1.66)	(−6.37)	(0.85)	(−0.35)	
1991	404	33.74	1.32	0.62	−1.61	0.13	−0.09	13.03
		(9.36)	(0.47)	(1.66)	(−7.20)	(0.75)	(−0.71)	
1992	399	33.94	1.88	1.47	−1.82	0.25	−0.01	22.97
		(7.99)	(0.50)	(3.16)	(−9.94)	(1.79)	(−0.11)	
1993	424	32.65	−0.49	0.62	−1.46	−0.15	−0.04	17.90
		(6.40)	(−0.11)	(2.11)	(−8.74)	(−0.87)	(−0.48)	
1994	448	30.03	−3.20	0.78	−1.08	0.11	−0.17	14.01
		(9.50)	(−1.60)	(2.67)	(−6.97)	(1.31)	(−1.90)	
1995	468	29.96	−2.10	0.59	−1.16	0.19	−0.01	14.27
		(11.41)	(−1.30)	(2.31)	(−8.20)	(1.34)	(−0.13)	
1996	519	32.99	−0.38	0.50	−1.55	0.09	−0.08	23.62
		(19.61)	(−0.48)	(2.24)	(−12.66)	(0.88)	(−1.13)	
1997	497	33.27	0.95	0.54	−1.74	−0.15	0.04	24.97
		(15.68)	(0.97)	(2.70)	(−10.79)	(−1.25)	(0.52)	
1998	437	36.80	1.06	0.65	−2.00	0.26	−0.24	30.26
		(16.88)	(1.02)	(2.97)	(−13.33)	(2.12)	(−2.40)	
1999	309	35.34	4.27	0.66	−2.14	0.06	−0.07	26.68
		(8.39)	(1.35)	(2.79)	(−10.70)	(0.20)	(−0.55)	
Average		31.33	0.77	0.66	−1.48	0.07	−0.06	17.58
		(20.47)	(0.98)	(9.04)	(−13.34)	(1.80)	(−2.14)	

Notes: The table reports the results of running the year-by-year regression,

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \varepsilon_{it}$$

where COST_{it} is either the cost of equity capital or the risk premium, BETA_{it} is the CAPM beta using a ten-year rolling window; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is the SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex post* conservatism measure. All variables are winsorized at the top and bottom 1 per cent. *t*-statistics are in parentheses

Table VIII.
Annual cross-sectional regressions of *ex post* conservatism

6.2 Alternative measures of the cost of equity capital

This section reports results using *ex post* average realised return and implied cost of equity capital derived from the PEG ratio model (Easton, 2004) as alternative measures of the cost of equity capital[10]. *Ex post* average realised return is an unbiased estimator of expected return if investors are rational and equity risk is properly priced. Assuming that the market is efficient and that investors are rational, Table IX reports results using one-year-ahead share return as an alternative measure of the cost of equity capital. We measure future realised returns by the continuously compounded 12 month return starting from April in the following year. We provide pooled regression results. The results show that the relation between *ex ante* conservatism and one-year-ahead return is significantly positive (0.01, $t = 4.08$). Less *ex ante* conservatism firms

No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON_RANK	Adjusted R^2(%)
Panel A1: Using ex ante *conservatism ranks as the independent variable*							
5,409	−0.11	0.15	−0.05	−0.01	0.01		1.02
	(−1.56)	(2.89)	(−5.98)	(−2.23)	(1.58)		
5,409	−0.17	0.15	−0.04	−0.01	0.01	0.01	1.13
	(−2.21)	(2.94)	(−4.78)	(−1.15)	(1.58)	(4.08)	
Panel A2: *Using* ex post *conservatism ranks as the independent variable*							
5,409	−0.07	0.16	−0.05	−0.01	0.01	−0.01	1.14
	(−0.99)	(3.08)	(−5.98)	(−2.29)	(1.58)	(−2.80)	
Panel B1: *Using raw values of the* ex ante *conservatism measure as the independent variable*							
No. of obs.	Intercept	BETA	LEV	SIZE	EVAR	CON	Adjusted R^2 (%)
5,409	−0.17	0.15	−0.04	−0.01	0.01	0.04	1.15
	(−2.40)	(3.35)	(−4.78)	(−1.12)	(1.58)	(2.90)	
Panel B2: *Using raw values of the* ex post *conservatism measure as the independent variable*							
5,409	−0.10	0.16	−0.05	−0.01	0.01	−0.03	1.08
	(−1.41)	(3.08)	(−5.98)	(−1.89)	(1.58)	(−2.12)	

Notes: The table reports the results of running the pooled regressions

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON\_RANK}_{it} + \varepsilon_{it}$$

$$\mathrm{COST}_{it} = \alpha_0 + \alpha_1 \mathrm{BETA}_{it} + \alpha_2 \mathrm{LEV}_{it} + \alpha_3 \mathrm{SIZE}_{it} + \alpha_4 \mathrm{EVAR}_{it} + \alpha_5 \mathrm{CON}_{it} + \varepsilon_{it},$$

where COST_{it} is the cost of equity measured by one-year-ahead share return, BETA_{it} is the CAPM beta using a ten-year rolling over method; LEV_{it} is the debt-to-equity ratio; SIZE_{it} is the log of equity market value; EVAR_{it} is the SD of earnings divided by the average reported earnings using a ten-year rolling window; $\mathrm{CON\_RANK}_{it}$ denotes the decile rank based on the *ex ante* and *ex post* conservatism measures; CON_{it} denotes raw values of the conservatism measures. All variables are winsorized at the top and bottom 1 per cent. White (1980) heteroskedasticity-consistent *t*-statistics are in parentheses

Table IX.
The results of using one-year-ahead share returns as a proxy for the cost of equity capital

are likely to experience higher realised returns. In addition, the coefficient on *ex post* conservatism is significantly negative (−0.01, $t = -2.80$). Untabulated results of annual cross-sectional regressions give qualitatively similar results to those in Table IX. These findings support our conclusions based on the OJ model. However, the lower adjusted *R*-squares and the magnitude and significance of the coefficients on the risk factors imply that *ex post* realised return is a poor proxy for the cost of equity capital, consistent with findings in the finance literature.

7. Conclusion

Previous studies have focused on the existence of accounting conservatism using different definitions and measures of conservatism, and have largely ignored the economic consequences of accounting conservatism. Several recent studies test the relation between accounting conservatism and earnings attributes, and provide mixed evidence. This could be due to these studies not considering the implications of different types of accounting conservatism for the quality of earnings and accounting information. There is also a lack of empirical evidence on exactly how conservative accounting practice affects equity valuation. We distinguish the pricing effects of different dimensions of conservatism by examining whether *ex ante* and *ex post* conservatism provide different

information about the quality of a firm's current and future earnings to equity investors. We argue that *ex ante* conservative accounting results in more persistent and predictable current and future earnings streams and therefore signals good quality earnings and accounting information to the market. We predict that *ex ante* conservatism is associated with lower costs of equity capital. However, managers may use *ex post* conservative accounting practices opportunistically to manipulate earnings, resulting in less persistent and predictable current and future earnings streams and therefore lower quality of earnings and accounting information. We therefore predict *ex post* conservatism is associated with higher costs of equity capital.

Our results are consistent with our predictions. We find that after controlling for CAPM beta, leverage, firm size and earnings variability, a firm with a higher degree of *ex ante* conservatism has a lower cost of equity capital. There is a 243 bp difference between the highest and lowest degrees of *ex ante* conservative firms. In contrast, higher *ex post* conservative firms are likely to have higher costs of equity capital due to greater information risk perceived by equity investors. Our results show that firms with the highest *ex post* conservatism face 63 bp higher costs of equity capital than the lowest *ex post* conservative firms. Results using one-year-ahead share return and implied cost of equity capital derived from the PEG ratio model lead to qualitatively consistent conclusions. The results are also consistent with our predictions after controlling for *ex ante* conservatism when examining the relation between costs of equity capital and *ex post* conservatism.

The empirical evidence in this study implies that different dimensions of conservative accounting have different effects on the quality of earnings and accounting information and costs of equity capital. Equity investors view firms with greater *ex ante* conservatism as lower risk firms, while greater *ex post* conservatism may be related to higher information risk. However, there are limitations to our study. Using *B*/*M* ratio may pick up not only a firm's degree of conservative reporting, but also other confounding factors. To the extent that the market is inefficient, stock price may not reflect a firm's true value. These issues may reduce the ability of *B*/*M* to measure absolute or relative *ex ante* conservatism although previous studies in this research area suffer from the same problem. Future research may consider more specific proxies for *ex ante* conservatism, such as the C-score suggested by Penman and Zhang (2002) and both unrecognised R&D and accelerated depreciation suggested by Beaver *et al.* (2005). With regard to our *ex post* conservatism measure, the sign of market-adjusted returns may not be a good proxy for economic gains and losses. Despite these limitations, the present study contributes to research on the economic consequences of accounting conservatism.

Notes

1. Consistent with previous studies (e.g. Penman and Zhang, 2002; Francis *et al.*, 2004), we interpret more persistent and predictable earnings as higher quality earnings.
2. Normative accounting theory prescribes accounting procedures. Its major aim is to discuss the "best" accounting treatment of a business transaction or economic event rather than to explain or predict accounting practice.
3. Francis *et al.* (2004) measure earnings quality by the SD of the estimated residuals from a regression of current accruals on one-year lagged, current, and one-year-ahead cash flow from operations.
4. Easley *et al.* (2002) develop a theoretical model in which asymmetric information (non-diversifiable risk) affects investors' required rates of return. Their findings indicate that the quality of accounting information has a significant effect on share returns after

controlling for other risk factors such as size and *B/M*: investors' required rates of return are higher for firms with more private and less public information.

5. Earnings properties include persistence and predictability. Several empirical studies (e.g. Penman and Zhang, 2002) use these earnings attributes as the main indicators of earnings quality.
6. As measurement error in estimating costs of equity capital based on the OJ model is a concern, we provide alternative measures in section 6.2 to support our conclusions.
7. We find 86 instances of missing cost of equity estimates based on Equation (7).
8. The coefficient β_1 s zero in 2,076 cases.
9. This is similar to the result of Gode and Mohanram (2003). The estimated risk premium based on the OJ model in their study remains quite stable in the USA from 1984 to 1998.
10. The implied cost of equity capital derived from the PEG model is the square root of the difference between one- and two-year-ahead forecasted earnings deflated by prior year end share price. Untabulated results using the PEG ratio show that *ex ante* (*ex post*) conservatism is positively (negatively) associated with costs of equity capital although its slope coefficients are smaller than those using the OJ model.

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Further reading

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