

Cost of Equity and Accounting Conservatism*

Juan Manuel García Lara
Universidad Carlos III de Madrid

Beatriz García Osma
Universidad Autónoma de Madrid
and
Lancaster University

Fernando Penalva[†]
IESE Business School, University of Navarra

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[†]Corresponding author. IESE Business School, University of Navarra, Av. Pearson, 21, 08034 Barcelona, Spain. E-mail: penalva@iese.edu. Tel. (+34) 93 253 4200, Fax. (+34) 93 253 4343.

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Abstract

High quality accounting information is expected to lower the cost of equity capital by reducing perceived risk, increasing liquidity and reducing transaction costs. Consistent with this argument, prior empirical evidence documents a negative relation between cost of equity and several measures of financial information quality (timeliness and persistence of earnings, accrual quality, predictability, smoothness, and value relevance). However, there is scarce research analyzing the relation between accounting conservatism and cost of equity capital. Francis *et al.* (2004) find that conservatism does not have an effect on the cost of equity. In this paper, we show that this *a priori* surprising result is driven by the inability of the firm-level proxy of conservatism chosen by Francis *et al.* to capture conservatism. Using a portfolio approach to measure conservatism, we find that conservatism in its different flavors (in the income statement, as asymmetric recognition of good and bad news; and in the balance sheet, as persistent understatement of assets) exhibits a robust negative association with proxies of the *ex ante* cost of capital, after controlling for known risk factors and innate determinants of this earnings attribute.

Keywords: *Conservatism, asymmetric timeliness, understatement of assets, cost of capital, informational risk*

JEL Classification: *G10, G38, M41.*

1. Introduction

In an excellent piece of research, Francis, LaFond, Olsson, and Schipper (2004) (FLOS henceforth), examine the relation between the cost of equity capital and seven earnings attributes: accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism. The first four attributes are referred to as accounting-based because they are measured using accounting information only; and the last three attributes are referred to as market-based, because their measurement involves using relations between stock returns and accounting data. Based on theoretical models predicting a negative association between information quality and cost of capital, FLOS hypothesize and find that, generally, more favorable values of the individual earnings attributes are associated with lower cost of equity capital, after controlling for known risks factors and innate determinants of the earnings attributes. FLOS also find that the accounting-based attributes exhibit stronger associations with the cost of equity than the market-based counterparts.

However, FLOS do not find any association between conservatism and cost of equity capital. They interpret this finding as suggesting that managers' discretionary actions to affect conservatism do not have any effect above the impact of the innate factors that determine conservatism.

This result seems surprising as conservatism is perhaps the most salient attribute of accounting numbers (Watts, 2003). Conservatism has been a pervasive characteristic of accounting practice for several centuries, and current empirical evidence indicates that it has increased in the last decades (Givoly and Hayn, 2000; Francis and Schipper, 1999). Income statement conservatism imposes stronger verification requirements for gains than

for losses. These stronger verification requirements for gains are expected to reduce investors' perceived risk. Risk-averse investors demand to be informed in a very timely manner about bad news affecting the firm. Should this demand not be satisfied, this must theoretically have an effect on the cost of equity capital. Easley and O'Hara (2004), O'Hara (2003), and Leuz and Verrecchia (2004) show that firm specific information risk is priced, and that this risk cannot be diversified away. Conservatism is expected to contribute to reduce the perceived information risk and, consequently, to lower the cost of equity capital.

We hypothesize and find that the cause driving FLOS's result of no relation between conservatism and cost of equity is the inability of their firm-level proxy of conservatism to efficiently capture conservative behavior. In a first stage, we test the validity of the FLOS conservatism proxy, show that it does not capture accounting conservatism and provide reasons as to why this is so.

In a second stage, we suggest an alternative way to test the association between income statement conservatism and ex-ante measures of cost of equity capital using a portfolio approach. Contrary to FLOS, we do find a strong negative association between conservatism and the cost of capital. We also find a negative association between conservatism in the balance sheet, as measured by the Penman and Zhang (2002) C-Score, and cost of equity capital.

The remainder of the paper is organized as follows. In Section 2, we test the validity of the proxy for income statement conservatism used by FLOS. In Section 3, we propose and implement a portfolio approach to analyze the relation between income statement conservatism and the cost of equity capital; we also use a firm-level measure of

balance sheet conservatism to analyze its impact on the cost of capital. Section 4 contains robustness tests using different proxies for the *ex ante* cost of equity capital. Finally, in Section 5, we summarize the findings and conclude the paper.

2. Assessment of the construct validity of the FLOS conservatism proxy

2.1. Measurement of the proxy and test design

FLOS rely on Basu (1997) to measure conservatism. They use the following model, where earnings is the dependent variable and stock returns the independent variable:

$$Earn_{j,t} = \beta_0 + \beta_1 Neg_{j,t} + \beta_2 Ret_{j,t} + \beta_3 Neg_{j,t} Ret_{j,t} + \mu_{j,t} \quad (1)$$

$Earn_{j,t}$ is defined as firm's j earnings per share before extraordinary items and discontinued operations in year t , deflated by share price at the beginning of the period. $Ret_{j,t}$ is firm's j 15-month stock return ending three months after the end of the fiscal year t . $Neg_{j,t}$ is a dummy variable that equals 1 in the case of bad news (negative or zero stock rate of return) and 0 in the case of good news (positive stock rate of return). The coefficient β_3 measures the level of asymmetric timeliness and it is expected to be positive and significant. FLOS construct their conservatism proxy as the ratio of the coefficient on bad news to the coefficient on good news:

$$Conservatism_{FLOS} = (\beta_2 + \beta_3)/\beta_2 \quad (2)$$

Higher values of $Conservatism_{FLOS}$ are associated with more conservative earnings.¹ To avoid the influence of extreme observations, FLOS use annual decile ranks of this variable. Equation (1) is estimated on a firm- and year-specific basis, using rolling ten-year windows. FLOS point out that this firm-specific approach has the advantage that it

¹ Actually, FLOS use the negative of this ratio to align it with their other earnings attributes, so that high values of the attributes indicate low information quality. In our case, this is unnecessary.

uses the firm as its own benchmark and mitigates concerns that differences among firms in a given industry give rise to noisy measures of the proxy, as would be the case if the proxy were measured by reference to industry portfolios.

However, this approach has several disadvantages that overcome its benefits. It introduces substantial survivorship bias as it requires a ten-year time-series of observations per firm. The estimates of the coefficients β_2 and β_3 in Equation (1) are extremely imprecise because of the low number of observations (10) as we show below. This concern is aggravated when stocks returns are regressed on earnings numbers or vice versa, because of the low explanatory power of these regressions. Finally, even if the firm changes its conservatism policies substantially in year t , the regression will still assign very little weight to the last observation and the proxy obtained, $Conservatism_{FLOS}$, will be a measure of the average conservatism over the last ten years ($t-9$ to t). On the other hand, the *ex ante* cost of capital can change quickly whenever there is new information available. This implies that the possible association between cost of equity capital and $Conservatism_{FLOS}$ will be attenuated by the design of the latter.

The impact of all these undesirable effects is that $Conservatism_{FLOS}$ is too noisy a proxy to capture accounting conservatism in a reliable manner. Basu (1997), Pope and Walker (1999), Givoly and Hayn (2000), and many others measure conservatism using a portfolio approach, with cross-sectional regressions, which reduces the error in the estimation of the coefficients β_2 and β_3 . Givoly *et al.* (2004) also estimate Basu's model using a times series approach, and calculate a firm-level measure of conservatism. They fail to find conservatism in the time series of many firms and argue that this result is attributable to a low power of the test due to the reduced number of observations for each

regression. When using this firm-level approach they explicitly argue (p. 5) “The inability of the differential timeliness measure to detect the basic conservative posture of conventional accounting in all, or even in most, firms indicated that the measure is subject to considerable measurement error or to a downward bias.”

To assess the construct validity of $Conservatism_{FLOS}$, we implement the following test. First, following FLOS, we estimate $Conservatism_{FLOS}$ for each firm-year and rank the earnings attribute each year forming deciles. Firms in the top decile (10) have the highest level of conservatism, while firms in the bottom decile (1) have the lowest level of conservatism. Second, for each sample year, we estimate Equation (1) by conservatism decile, and take the average of the estimated annual coefficients β_2 and β_3 for each decile. These estimates are far more reliable than the firm-specific estimates as they contain less measurement error because the estimation regression has a large number of observations, and all the firms in the decile have a similar level of conservatism according to $Conservatism_{FLOS}$. With this new set of coefficients, we construct the conservatism proxy using equation (2). We refer to this new conservatism proxy as $Conservatism_{PORT}$. If $Conservatism_{FLOS}$ correctly measures accounting conservatism in a Basu (1997) sense, we expect to find a significant correlation between the deciles of $Conservatism_{FLOS}$ and our new proxy, $Conservatism_{PORT}$.

2.2. Description of the sample to assess the construct validity of $Conservatism_{FLOS}$

We use COMPUSTAT to extract accounting data and CRSP to extract stock market data. To increase the power of our tests, we employ as many observations as possible from the available data sources. Our sample period covers 29 years, $t = 1975$ to 2003. Like FLOS, we estimate $Conservatism_{FLOS}$ over rolling firm-specific ten-year windows. This implies

that for a firm to be included in the sample in year t , it needs to have data available in years $t-9$ to t . This procedure results in 54,584 firm-year observations corresponding to 5,914 distinct firms. In almost 13.86 percent of cases, some observations do not experience negative or zero returns over the estimation window. In these instances in which β_3 is not defined, we follow FLOS and assign β_3 a value of zero to calculate $Conservatism_{FLOS}$. To assess the appropriateness of this simplifying assumption, we also conduct a robustness test in which we drop these observations. The inferences are unchanged.

Table 1 contains the descriptive statistics of the variables of interest. The most striking feature is the large dispersion in the estimated coefficients. Coefficient β_2 is negative 22.55 percent of the times and it is significantly different from zero (p-value ≤ 0.1) in 29.29 percent of the observations. Coefficient β_3 is negative 45.12 percent of the times and it is significantly different from zero (p-value ≤ 0.1) in 10.81 percent of the observations only. This does not seem to be descriptive of reality. Conservatism is a distinctive characteristic of accounting information and it has even increased with the passage of time. The results of Table 1 seem to indicate that more than 45 percent of the firm-years are aggressive instead of conservative, which is hard to believe.² Moreover, previous research (Basu, 1997; Pope and Walker, 1999; Ball *et al.*, 2000; etc.) finds that, on average, β_3 is positive, larger than β_2 and more significant, and this is not the case in our sample. The reason for these findings is that the estimation method, although theoretically sound, is highly unreliable because of the small number of observations (10) per regression. The problems are compounded when $Conservatism_{FLOS}$ is calculated in

² Givoly *et al.* (2004), using a similar firm-level approach, find that more than 50% of firms in their sample are aggressive, and not conservative.

the cases in which β_2 is negative: if β_3 is positive—indicating the presence of conservatism—the ratio $(\beta_2 + \beta_3)/\beta_2$ is negative and that firm-year observation is classified as having low conservatism when it is just the opposite. Column 6 in Table 1 depicts the descriptive statistics of *Conservatism_{FLOS}*. Only for the purposes of this table, the mean and standard deviation of the conservatism proxy reflect the winsorization of the sample at the 1 and 99 percentiles. It is striking to observe that *Conservatism_{FLOS}* is negative 35.63 percent of the times. The last column of Table 1 reproduces the summary statistics of *Conservatism_{FLOS}* as reported by FLOS (p. 982). Our sample and theirs are extremely similar as all the values are very close, despite the fact that we include two additional years (2002 and 2003).

2.3. Results of the test to assess the construct validity of *Conservatism_{FLOS}*

Table 2 reports the results of running the Basu (1997) model annually for each decile of *Conservatism_{FLOS}*. The reported coefficients are the averages across years as in Fama and Macbeth (1973). The statistical significance is assessed using the time-series standard errors of these estimates. The coefficient β_2 is positive and significant in all but two cases. The coefficient β_3 is positive, larger than β_2 , and significant in all cases. These findings are consistent with previous research on income statement conservatism. The last column contains the new conservatism proxy, *Conservatism_{PORT}*, based on the average coefficients β_2 and β_3 . We can observe that there is no relation between the decile ranks of *Conservatism_{FLOS}* and *Conservatism_{PORT}*. Instead of exhibiting an ascending trend as we move down the decile ranks, *Conservatism_{PORT}* exhibits a V-shape. Both the Pearson and Spearman correlations between the two proxies are not significantly different from zero. This confirms our suspicions that *Conservatism_{FLOS}*, despite being a

theoretically sound proxy for conservatism, contains too much noise, which renders the proxy useless for further analyses. If we repeat our test pooling all sample years within each decile rank, we obtain (unreported) identical inferences.

3. Test to assess the association between conservatism and cost of capital

3.1. Measurement of the cost of equity capital

We employ the measure of cost of capital (*CofC*) used by FLOS. With this choice, we ensure that the possible differences between our tests and those in FLOS are not driven by this factor. The measure chosen is based on Brav *et al.* (2005), who propose an *ex ante* proxy of *CofC* derived from price target and dividend data provided by Value Line reports. In our robustness tests, we will use other *ex ante* measures of *CofC* described in Claus and Thomas (2001) and Easton (2004) that rely on analysts' forecast data compiled by I/B/E/S. Brav *et al.* (2005) arrive at the following expression to calculate the ex-ante cost of equity capital:

$$(1+r^{VL})^4 = \frac{TP}{P} + \frac{DIV \left[\frac{(1+r^{VL})^4 - (1+g)^4}{r^{VL} - g} \right]}{P}$$

where r^{VL} is the *ex ante* estimate of the cost of equity capital, TP is the Value Line four year out target price, P is stock price nine days prior to the date of the Value Line report, DIV is the Value Line forecast of next year dividends and g is the Value Line's forecasted dividend growth rate. In Section 5, we discuss the appropriateness of this measure.

Value Line issues forecasts every 13 weeks without conforming to either calendar or fiscal quarters. Following FLOS, for each firm we combine all the forecasts of calendar year t into a single forecast by taking the average of the available forecasts of year t . In this way, we can better compare our results to those in FLOS. The inferences do not change if we take the cost of capital estimate for the last quarter of the year.

To analyze the relation between *ex ante* cost of equity capital and conservatism we control for the risk factors that determine cost of capital. We also control for the innate determinants of earnings properties that affect the conservative behavior of the firm. This control for risk factors and innate determinants of earnings properties is aimed at removing economic factors that stem from the particular business activities or the operating environment of the firm that partly determine cost of capital and a certain level of conservatism. Like FLOS, we focus on how the market is pricing discretionary firm decisions. Consequently, we use the residuals (r^{VL*}) of the following model as our *ex-ante* measure of the cost of equity capital:

$$r^{VL} = \alpha + \beta \text{ Risk Proxies} + \gamma \text{ Innate earnings determinants} + u \quad (3)$$

We interpret r^{VL*} as a measure of *ex ante* cost of equity capital not explained by risk factors or firm characteristics. The residuals capture variation in cost of capital orthogonal to risk factors and to firm and operating environment characteristics. This is, variation driven by other factors not considered in Equation (3). Information risk is among these non-considered factors.

Risk Proxies:

We control for risk factors to isolate the effect of informational risk on the cost of capital.

We see conservatism as a broad measure of information risk, as conservatism is a

summary measure of a wide range of discretionary accounting decisions taken by the firm. Following prior literature, we use the following risk factors: a) the CAPM beta, b) market capitalization (size), c) the book-to-market ratio, d) the standard deviation of returns, e) prior price momentum, and f) leverage. According to the CAPM, a stock's market beta should be positively correlated with its cost of equity. Numerous empirical studies find a positive association between beta and cost of equity. We estimate beta for each firm-year using a market model regression of excess returns (i.e., market return less the yield of a one-month treasury bill) with monthly data over rolling windows of 60 months ending at the end of the fiscal year (with a minimum of 24 observations). Market capitalization (size) is expected to have a negative relation with cost of equity. Investors expect small capitalization stocks to generate higher returns. Previous research has documented that on average small capitalization stocks outperform large capitalization stocks, which is consistent with a risk-return trade-off. This negative association has been widely documented (see for example Banz, 1981, or Fama and French, 1992). We measure size as the log of the market capitalization at the beginning of the fiscal year. As regards the book-to-market ratio, there is not a clear consensus in the literature as how it affects cost of equity capital. Berk (1995) argues that given that the book-to-market ratio is inversely related to market value, its relation with the cost of capital should be positive. Others, like Dechow *et al.* (2004) argue that high book-to-market stocks are less risky. Empirical evidence about this issue is also contradictory. We estimate the book-to-market ratio as the ratio of common shareholders equity to market capitalization as of the beginning of the fiscal year. With respect to the standard deviation of returns, Malkiel and Xu (1997) suggest a positive relation between cost of capital and total risk as

measured by the variance of returns. We estimate total risk as the annualized standard deviation of daily returns using one-year windows ending at the beginning of the fiscal year. Regarding price momentum, its relation with cost of equity is not clear. Conrad and Kaul (1998) argue that past winners are firms that have become riskier over time and deserve a higher return. In this sense, momentum measures are expected to be positively related to the cost of capital. However, Jegadeesh and Titman (1993) show that past winners earn substantially higher returns over the next 3 to 12 months, which could be regarded by investors as reducing risk. We follow Brav et al. (2005) to measure momentum, which we define as the log of one plus the buy-and-hold return for the 11-month period ending one month prior to the beginning of the fiscal year. Firms with higher leverage are expected to be riskier (Modigliani and Miller, 1958). We measure leverage as the ratio of total liabilities to market value of equity at the beginning of the year. Finally, given the evidence in Fama and French (1997) that documents the strong influence of industry factors in the cost of capital, we include in our model indicator variables for the 48 industry groups described in Fama and French.

Innate determinants of earnings attributes

Conservatism, as the other earnings attributes considered in FLOS, is the result of discretionary accounting choices and also of the business model and operating environment of the firm. We focus on whether the discretionary choices that lead to more conservative accounting numbers have an effect on the cost of equity capital. To isolate the discretionary component of the earnings attribute of interest, conservatism, we control for several innate determinants considered in previous work (Dechow and Dichev, 2002; and FLOS). We control for the following innate determinants of conservatism: firm size,

cash flow variability, sales variability, length of the operating cycle, incidence of negative earnings realizations, intangibles intensity, absence of intangibles, and capital intensity.

We measure the innate determinants as in FLOS. Firm size as the log of total assets. The proxy for cash flow variability is the standard deviation of the firm's rolling ten-year cash flows from operations, scaled by total assets. Sales variability is computed as the standard deviation of rolling ten-year sales revenues, scaled by total assets. The length of the operating cycle is measured as the log of the sum of the firm's days of receivables and days of inventory. The incidence of negative earnings realizations is calculated as the proportion of losses over the prior ten years. The intensity of intangibles is captured by the sum of the firm's reported R&D and advertising expenses, scaled by total sales (missing values of these items are set to zero). The absence of intangibles is measured with an indicator variable that takes on the value of 1 if the intensity of intangibles is zero, and 0 otherwise. Capital intensity is calculated as the net book value of property, plant and equipment, scaled by total assets.

3.2. Sample selection, summary statistics, and assessment of the cost of capital proxy

We draw our sample from public data sources. Accounting data are extracted from Compustat and market returns data from CRSP. These data are merged with the Value Line sample of cost of capital estimates supplied by Brav *et al.* (2005). The resulting sample comprises 21,183 firm year observations, corresponding to 1,983 distinct firms, during the period 1975-2001. Table 3, Panel A shows descriptive statistics of the *ex ante* cost of equity capital (r^{VL}) as per Brav *et al.* (2005). The sample and basic descriptive statistics are virtually identical to the ones reported in FLOS. This design choice facilitates the comparison of results. The sample contains an average of 785 firms

for the period 1975-2001, which gives a total of 21,183 firm-year observations. The average cost of capital is the same as in FLOS, that is, 21%.

Panel B of Table 3 reproduces the summary statistics of the five risk proxies and the eight innate earnings determinants. It also contains a balance sheet proxy of conservatism (C-Score) which is described below, and the variables of the Basu (1997) regression. The table reflects the annual winsorization of the variables at the 1 and 99 percentiles. The results are in line with those reported in FLOS. The mean beta is 1.04 indicating that our sample firms are relatively risky; the average size of the sample firms is 6.24 (\$511 million); the mean book-to-market ratio is 0.82 reflecting that sample firms trade at market values in excess of book values reflecting the presence of unrecognized intangible assets; the mean of the annualized standard deviation of one year of daily returns is 0.35; the average momentum is 0.11; and the mean (median) ratio of total liabilities to market value of equity is 1.29 (0.85) indicating high leverage for the average firm and a highly skewed distribution. As for the innate earnings determinants, the average log of total assets is 6.65, and the mean of the variability in operating cash flows and sales is 0.06 and 0.17 respectively. The mean operating cycle is equivalent to 117 days, and the proportion of losses in the previous ten years for the average firm is 0.07. The mean value of the intangibles intensity is 0.03, and 35 percent of the sample firms report zero expenditures in R&D and advertising (intangibles dummy). The average capital intensity equals 0.35.

In Table 4 we report the results of running Equation (3), which we use to calculate our final proxy for ex-ante cost of capital, controlling for risk factors and innate earnings determinants. In Panel A we regress our measure of the *ex ante* cost of equity capital r^{VL}

on the risk proxies only. As in Botosan and Plumlee (2005), the signs of the risk factors coefficients will help us validate the cost of capital proxy. As we can see in Panel A, the coefficients on the risk proxies are consistent with their theoretical expected effect on the cost of equity capital. The cost of equity increases with the CAPM beta, the book-to-market ratio, the standard deviation of returns and leverage, and it decreases with market capitalization and momentum. In Panel B we run Equation (3) including the risk proxies and the innate earnings determinants. We can see that the coefficient on the book-to-market ratio flips the sign becoming negative, and the coefficient on leverage loses its significance. This indicates that the innate earnings determinants capture some of the information in these two risk proxies. FLOS report a similar occurrence in their regressions when the innate determinants are included. In their case, book-to-market becomes insignificant. For our subsequent tests we use the residuals of the model in equation (3) including risk factors and innate earnings determinants, as our proxy for the cost of equity capital: r^{VL*} .

3.3. Tests of the association between cost of capital and income statement conservatism

Although we examine different metrics of conservative accounting numbers and analyze both conservatism in the income statement and in the balance sheet, in this section we focus on Basu (1997) income statement definition of conservatism, that is, on the asymmetric recognition of good and bad news in earnings. This is the definition of conservatism used in FLOS.

Contrary to FLOS, we will use a portfolio (cross-sectional) approach to measure conservatism. Firm-level measures of income statement conservatism are subject to considerable measurement error as shown in Table 2 and also in Givoly *et al.* (2004).

Annually, we rank firms in ten portfolios according to r^{VL*} and assign a value of 0.1 (1) to the portfolio with the smallest (largest) values of r^{VL*} . We refer to the annual decile-rankings as K.

As a first test to analyze the relation between income statement conservatism and cost of capital we will use the association model proposed by Basu to assess the asymmetry in news recognition in earnings. In particular, we run the Basu regression (Equation 1) annually for each decile of the cost of capital, and compute the average of the annual coefficients using the Fama and Macbeth (1973) approach. With the estimated average coefficients, we compute the conservatism measure for each decile of K as follows:

$$Conservatism_{PORT A} = (\beta_2 + \beta_3)/\beta_2 \quad (4)$$

If conservatism is associated with the cost of capital, we expect to find a negative correlation between the cost of capital decile-rankings and $Conservatism_{PORT A}$; this is, the higher the conservatism, the lower the cost of capital. Table 5, Panel A contains the results. As we can see, conservatism is present in all the deciles, confirming previous research that documents the pervasive presence of conservatism in accounting numbers. Coefficients β_2 and β_3 are positive and significant, with β_3 being always larger than β_2 . When we compute $Conservatism_{PORT A}$, we observe a declining trend as we move upwards in the decile rankings K: lower values of K are associated with higher values of $Conservatism_{PORT A}$. This confirms the expected association between conservatism and the cost of capital.

To test the robustness of this result, we incorporate the decile-rankings of the cost of capital into the Basu regression by interacting K with the explanatory variables of the model as follows:

$$\begin{aligned} \text{Earn} = & \beta_0 + \beta_{01} K + \beta_1 \text{Neg} + \beta_{11} \text{Neg} K + \beta_2 \text{Ret} + \\ & + \beta_{21} \text{Ret} K + \beta_3 \text{Ret Neg} + \beta_{31} \text{Ret Neg} K + \mu \end{aligned} \quad (5)$$

We expect that if the relation between income statement conservatism and cost of equity capital is negative, then $\beta_3 + \beta_{31} < \beta_3$ (i.e., β_{31} will be significantly negative).

Table 5, Panel B shows the results of this analysis. As we can see, β_{31} is negative and significant at a 0.1 confidence level, and $\beta_3 + \beta_{31}$ is significantly lower than β_3 at a 0.01 confidence level. We also observe that firms with larger cost of capital estimates recognize good news faster (i.e., $\beta_2 + \beta_{21} > \beta_2$), which is consistent with aggressive firms having larger cost of capital estimates.

Based on the results from Panel B in Table 5, we calculate a conservatism measure at the portfolio level that we define as follows:

$$\text{Conservatism}_{PORT B} = (\beta_2 + \beta_{21} K + \beta_3 + \beta_{31} K) / (\beta_2 + \beta_{21} K) \quad (6)$$

where K ranges from 0.1 to 1. This measure is the same as in FLOS, that is, the ratio of the coefficient on bad news to the coefficient on good news, but introducing the differences across cost of equity capital portfolios. The last two columns in Panel B of Table 5 show $\text{Conservatism}_{PORT B}$ ordered by K, the decile ranking of cost of equity capital. The portfolios with the smallest cost of equity capital (lowest K) show the largest values of the conservatism proxy. $\text{Conservatism}_{PORT B}$ varies from 9.04 for the firms in the first decile (smallest cost of equity), to 5.02 for the firms in the last decile, and the conservatism proxy always decreases monotonically.

Panel C in Table 5 summarizes the findings of the previous two tests and also reports the mean values of r^{VL} and r^{VL*} for each decile K of the cost of capital. Panel D contains a graphical representation of the trend of $Conservatism_{PORTA}$ when the cost of capital increases. To fit the trend line, we use a smoothing procedure, *lowess*, that carries out a locally weighted regression of $Conservatism_{PORTA}$ on K .³ The figure clearly shows the negative association between conservatism and cost of capital, which confirms our hypothesis.

3.4. Cost of equity and conservatism in the balance sheet

The main findings in FLOS rely on the conservatism measure of Basu (1997). They also point out that using the balance sheet measure of conservatism suggested by Penman and Zhang (2002) they are also unable to find an association between the cost of capital and conservatism. The reason for their alternative measure is to incorporate, as a robustness test, other metrics for conservatism used in the literature. Feltham and Ohlson (1995), Beaver and Ryan (2000), Zhang (2000), Givoly and Hayn (2000), Penman and Zhang (2002), Pope and Walker (2003) and Beaver and Ryan (2005) analyze conservatism from a balance sheet point of view. Feltham and Ohlson (1995) define conservatism as a persistent understatement of the book value of shareholders' equity with respect to the fundamental value of the firm. They argue that this difference between book value and fundamental value (which could be proxied by market value if we assume market efficiency) is attributable to the use of historic cost and to the non-recognition of certain intangible assets.

³ The figure was obtained with the statistical package STATA (version 8) using the command "twoway lowess $Conservatism_{PORTA}$ K ."

The difference between the Basu definition of conservatism and the one given by Feltham and Ohlson is that while the income statement conservatism is a temporary question—how quickly the accounting system captures news about the firm, the Feltham and Ohlson definition implies a permanent difference between accounting numbers and fundamental values. Subsequent research analyzes the relation between the two types of conservatism, showing that conservatism in the balance sheet, as described by Feltham and Ohlson, is an extreme form of conservatism in the income statement where bad news is totally anticipated and captured in earnings even before its occurrence. This anticipation to the bad news would not be captured by Basu’s methodology (Equation 1). Subsequent research uses the terms “income statement”, “ex-post”, “conditional” or “news-driven” conservatism to refer to the asymmetric recognition of news in earnings described by Basu. The terms “balance sheet”, “ex-ante”, “unconditional” or “pervasive” conservatism are used to refer to the persistent difference between market measures and accounting measures of the value of the firm.

In this section we address the question of whether more conservative accounting from a balance sheet perspective (understatement of assets), leads to a decrease in the information risk and, consequently, to a decrease in the cost of equity capital. To do so, we use the C-Score measure of conservatism proposed by Penman and Zhang (2002). Penman and Zhang (2002, p.238) define conservative accounting as “choosing accounting methods and estimates that keep the book value of net assets relatively low”. In this sense, LIFO accounting for inventories is conservative relative to FIFO (assuming normal inflationary economies); expensing research and development costs is conservative relative to recognition and subsequent amortization; and use of depreciation

methods that yield accounting depreciation charges larger than the true economic depreciation is also conservative. As Penman and Zhang (2002) point out, the C-score measures the effects of conservative accounting on the balance sheet. It captures the level of estimated reserves created by conservatism, deflated by net operating assets. Formally:

$$C - Score_{it} = \frac{[INV_{it}^{RES} + RD_{it}^{RES} + ADV_{it}^{RES}]}{NOA_{it}} \quad (7)$$

where INV^{RES} is the inventory reserve calculated as the LIFO reserve reported in the financial statements footnotes, RD^{RES} is the estimated amortized R&D assets that would have been on the balance sheet if R&D had not been expensed, amortized using the sum-of-the-years-digits method over five years. ADV^{RES} is the estimated brand assets created by advertising expenditures, amortized using a sum-of-the-years digits method over two years. NOA is net operating assets; this is, assets minus liabilities, excluding financial assets and liabilities. Following Penman and Zhang (2002), we deleted firm-years only if we could compute none of the three sub-scores (INV^{RES} , RD^{RES} , ADV^{RES}) from the Compustat data. When just one or two sub-scores were missing, we used industry median sub-scores (for two-digit SIC industry groups) as substitutes to calculate the overall C-score for that firm-year.⁴

The C-Score provides us with a firm-year measure of conservatism, which we can directly use in Equation (3) as a proxy for information risk. Higher values of the C-Score reflect more conservative accounting choices, leading to a decrease in information risk and, consequently, to reduced estimates of the *ex ante* cost of capital. Thus, to estimate

⁴ We are grateful Stephen Penman and Xiao-Jun Zhang for providing the code to calculate the C-Score.

the effect of balance sheet conservatism on the cost of equity capital, we run the following regression:

$$r^{VL} = \alpha + \theta \text{ C-Score} + \beta \text{ Risk Proxies} + \gamma \text{ Innate earnings determinants} + u \quad (8)$$

If the C-Score is efficiently capturing conservatism and can be interpreted as a proxy for non-diversifiable information risk, then it should exhibit a negative association with the cost of equity capital. This implies that the regression coefficient on the C-Score should be negative and significant. Table 6 shows the results of this analysis. The coefficient θ is significantly negative as expected, which is consistent with our hypothesis about the negative relation between conservatism and cost of equity capital.

4. Alternative proxies for the ex-ante cost of equity capital

In this section we perform several robustness tests to confirm our findings. The validity of our results hinges crucially on the assumption that our *ex ante* measures of cost of equity capital are reliable. Botosan and Plumlee (2005) assess the validity of several estimates for the *ex ante* cost of equity capital looking at “the extent to which the estimates are associated with firm risk in a stable and meaningful manner”. In this sense, and if we follow their approach, we can use our results in Table 4, Panel A to validate our *ex ante* measure of cost of equity capital, as the coefficients of the risk measures have the expected signs. This result is consistent with the results in Botosan and Plumlee (2005). They argue that, based on their findings, the Value Line-based estimates of the *ex ante* cost of equity capital are preferable to those proposed in Gebhart *et al.* (2001), Gordon and Gordon (1997) or Ohlson and Jüttner-Nauroth (2005).

The choice of the Brav *et al.* (2005) estimates of the *ex ante* cost of capital as our main measure of cost of equity capital is based on the grounds of the reliability of Value Line-based estimates highlighted in Botosan and Plumlee (2005), and also in an attempt to ensure comparability with the basic results in FLOS, as this is the measure they use. Also, and as FLOS point out, using other measures like the ones proposed by Claus and Thomas (2001) or the PEG and MPEG estimates used by Easton (2004) would drastically reduce our sample. When using the Claus and Thomas (2001), PEG or MPEG estimates we lose all observations prior to 1984, which reduces the sample size by approximately 5,000 firm-year observations. An additional advantage of the Value Line-based proxies is that we also reduce the optimism bias introduced when using I/B/E/S-based estimates.

In spite of the problems associated with the use of other cost of capital proxies, we replicate our main tests using the estimates proposed by Claus and Thomas (2001), and the PEG and MPEG estimates used by Easton (2004). Easton and Monahan (2005) document that the Claus and Thomas estimate of the cost of capital is reliable when the consensus long-term growth in earnings forecasts are low,⁵ while PEG and MPEG cost of capital estimates are unreliable in all circumstances. Regarding the relation between balance sheet conservatism (as measured by the C-Score) and the different *ex ante* cost of capital proxies, the relation is always significantly negative, and the results of Table 6 are qualitatively identical when using either the Claus and Thomas (2001), PEG, or MPEG estimates of ex-ante cost of capital. That is, regardless of the proxy used for the *ex ante* cost of equity capital, the C-Score coefficient in Equation (8) is always significantly negative. Overall, we observe that there is a clear and robust negative relation between

⁵ The empirical evidence in Easton and Monahan (2005) indicates that the Claus and Thomas (2001) cost of capital estimate is reliable when long-term growth forecasts in earnings are below 24.1%, on average.

conservatism in the balance sheet and cost of equity, showing that balance sheet conservatism can also be interpreted as a property of accounting numbers that reduces information risk.

Regarding the relation between income statement conservatism and cost of equity, results using the Claus and Thomas (2001) estimate of the cost of capital are very similar to the results we obtain with the Brav *et al.* (2005) estimate, and document a significant negative association between conservatism and cost of equity capital. These results also hold when we restrict the sample to observations with low consensus long-term growth forecasts in earnings. The results based on Easton (2004) PEG and MPEG estimates are not totally consistent with the ones based on Claus and Thomas (2001) and Brav *et al.* (2005), and do not show a clear negative relation between the estimates of cost of equity capital and conservatism. This inconsistency with our main results could be attributable to PEG and MPEG estimates not being completely reliable measures of the cost of equity capital, as documented by Easton and Monahan (2005). If we turn back to the Botosan and Plumlee (2005) assessment of the reliability of cost of capital estimates, when we replicate the results in Table 4, Panel A for the PEG estimates the coefficients on market capitalization and the book to market ratio are not significant. In the MPEG case, market capitalization and prior price momentum are not significant either. Based on the Botosan and Plumlee (2005) approach, this evidence indicates that the reliability of these estimates is questionable, which is in agreement with the results in Easton and Monahan (2005).

5. Summary and conclusions

We provide empirical evidence that documents a significant negative relation between income statement and balance sheet measures of accounting conservatism and estimates of the *ex ante* cost of equity capital. Our evidence is consistent with conservative accounting reducing information risk and, therefore, the cost of equity capital. We also show that prior evidence of no relation between cost of equity and conservatism is driven by the use of inadequate firm-level proxies of conservatism that, despite being theoretically sound, contain too much noise.

Our results regarding balance sheet conservatism are of especial interest to firms and accounting regulators as they suggest that more “liberal” accounting choices like free recognition of intangible assets or revaluation of assets could lead to increases in the cost of equity capital.

On the other hand, our results regarding the relation between cost of equity capital and income statement conservatism suggest that investors value more timely accounting information only if it pertains to negative news, which again highlights that overriding reliability for the sake for increased relevance could lead to increases in investors’ perceived risk and firms’ cost of equity capital.

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TABLE 1
Descriptive statistics of the sample to test the construct validity of *Conservatism*_{FLOS}

Stats	Coef. β_2	p-value of β_2	Coef. β_3	p-value of β_3	FLOS (2004, p. 982)	
					<i>Conservatism</i> _{FLOS} [†]	<i>Conservatism</i> _{FLOS} [†]
mean	0.060	0.364	-402.406	0.525	0.606*	0.547*
sd	0.746	0.308	61685.87	0.298	26.916*	27.457*
min	-39.760	0.000	-9458376	0.000	-145,000,000	N.R.
p1	-0.764	0.000	-4.368	0.002	-149.155	N.R.
p5	-0.156	0.004	-1.093	0.034	-22.101	N.R.
p10	-0.061	0.015	-0.561	0.090	-8.166	-7.870
p25	0.005	0.080	-0.163	0.270	-1.088	-1.104
p50	0.049	0.289	0.028	0.547	1.000	1.000
p75	0.115	0.616	0.241	0.788	2.733	2.698
p90	0.218	0.848	0.718	0.918	10.501	10.087
p95	0.328	0.927	1.324	0.960	24.021	N.R.
p99	0.878	0.985	4.548	0.993	135.303	N.R.
max	53.254	1.000	289.140	1.000	67,840	N.R.
nobs	54,584	54,584	47,020	47,020	54,584	39,726
	Percentage of negative β_2	Percentage of p-value $\beta_2 \leq 0.1$	Percentage of negative β_3	Percentage of p-value $\beta_3 \leq 0.1$	Percentage of negat. <i>Conservatism</i>_{FLOS}	
	22.55%	29.29%	45.12%	10.81%	35.63%	

* The mean and the standard deviation reflect the winsorization at the 1 and 99 percentiles.

† The coefficient β_3 is assigned a value of zero when it is not defined in order to obtain *Conservatism*_{FLOS}. This occurs when there are no negative or zero returns during the 10-year estimation window (13.86% of the times).

N.R. stands for not reported.

$$Earn_{j,t} = \beta_0 + \beta_1 Neg_{j,t} + \beta_2 Ret_{j,t} + \beta_3 Neg_{j,t} Ret_{j,t} + \mu_{j,t}$$

Results from the estimation of regression (1), reproduced above, on a firm- and year-specific basis, using rolling ten-year windows. The sample covers the period 1975-2003 and has 54,584 firm-year observations, corresponding to 5,914 distinct firms. The table contains the summary statistics of the estimated coefficients of interest. $Earn_{j,t}$ is firm's j earnings per share before extraordinary items and discontinued operations in year t , deflated by share price at the beginning of the period. $Ret_{j,t}$ is firm's j 15-month stock return ending three months after the end of the fiscal year t . $Neg_{j,t}$ is a dummy variable that equals 1 in the case of bad news (negative or zero stock rate of return) and 0 in the case of good news (positive stock rate of return). Francis *et al.* (2004) (FLOS) construct their conservatism proxy as the ratio of the coefficient on bad news to the coefficient on good news: $Conservatism_{FLOS} = (\beta_2 + \beta_3)/\beta_2$. The last column of the table reproduces the summary statistics reported by FLOS on page 982, with the sign reversed, because they define conservatism as the negative of the above ratio.

TABLE 2
Test of the construct validity of $Conservatism_{FLOS}$

$Conservatism_{FLOS}$ decile rank	Average coef. β_2	t-stat	Average coef. β_3	t-stat	$Conservatism_{PORT}$
1	0.025	2.73	0.512	3.48	21.209
2	0.013	0.77	0.301	6.03	24.446
3	0.015	0.97	0.302	5.31	21.558
4	0.050	2.90	0.238	4.44	5.793
5	0.046	3.53	0.535	2.19	12.670
6	0.089	3.78	0.173	2.17	2.950
7	0.071	5.65	0.236	5.36	4.326
8	0.058	5.37	0.431	12.94	8.393
9	0.052	6.49	0.543	8.68	11.429
10	0.037	3.78	0.851	10.17	23.763

Pearson correlation between $Conservatism_{FLOS}$ decile rank and $Conservatism_{PORT}$: -0.323 (p-value = 0.362)
Spearman correlation between $Conservatism_{FLOS}$ decile rank and $Conservatism_{PORT}$: 0.346 (p-value = 0.328)

$$Earn_{j,t} = \beta_0 + \beta_1 Neg_{j,t} + \beta_2 Ret_{j,t} + \beta_3 Neg_{j,t} Ret_{j,t} + \mu_{j,t}$$

The sample covers the period 1975-2003 and has 54,584 firm-year observations, corresponding to 5,914 distinct firms. The table contains the results from the estimation of regression (1) on a $Conservatism_{FLOS}$ decile rank- and year-specific basis. Firms in the bottom decile (1) have the lowest level of conservatism as per the FLOS measure, while firms in the top decile (10) have highest level of conservatism. Following Fama and Macbeth (1973), we report the mean of the annual coefficients for each decile rank; the t-statistics are based on the standard errors of the time-series of the annual estimates. $Earn_{j,t}$ is firm's j earnings per share before extraordinary items and discontinued operations in year t , deflated by share price at the beginning of the period. $Ret_{j,t}$ is firm's j 15-month stock return ending three months after the end of the fiscal year t . $Neg_{j,t}$ is a dummy variable that equals 1 in the case of bad news (negative or zero stock rate of return) and 0 in the case of good news (positive stock rate of return). Using the estimated average coefficients β_2 and β_3 , we construct a new conservatism measure: $Conservatism_{PORT} = (\beta_2 + \beta_3)/\beta_2$.

TABLE 3

Panel A: Descriptive statistics of ex-ante cost of capital as per Brav *et al.* (2005)

Year	N. Obs.	Mean	St. Dev	p10	p25	p50	p75	p90
1975	689	0.34	0.12	0.19	0.25	0.33	0.41	0.51
1976	707	0.29	0.09	0.18	0.23	0.28	0.35	0.42
1977	721	0.29	0.08	0.19	0.24	0.28	0.34	0.40
1978	744	0.29	0.07	0.20	0.24	0.29	0.34	0.38
1979	775	0.32	0.08	0.21	0.27	0.32	0.38	0.43
1980	787	0.32	0.11	0.18	0.25	0.33	0.40	0.46
1981	780	0.30	0.07	0.22	0.25	0.29	0.34	0.38
1982	781	0.32	0.07	0.22	0.26	0.31	0.37	0.42
1983	863	0.20	0.06	0.12	0.16	0.20	0.24	0.27
1984	998	0.24	0.06	0.16	0.19	0.23	0.27	0.31
1985	948	0.20	0.06	0.12	0.16	0.19	0.23	0.27
1986	911	0.15	0.06	0.09	0.12	0.15	0.19	0.23
1987	858	0.14	0.06	0.07	0.11	0.14	0.17	0.21
1988	826	0.18	0.06	0.11	0.14	0.17	0.21	0.26
1989	795	0.16	0.06	0.10	0.12	0.16	0.19	0.24
1990	782	0.20	0.07	0.11	0.14	0.19	0.24	0.30
1991	783	0.18	0.07	0.10	0.13	0.17	0.22	0.28
1992	791	0.17	0.07	0.08	0.11	0.16	0.21	0.26
1993	774	0.14	0.06	0.06	0.10	0.14	0.18	0.23
1994	794	0.15	0.06	0.08	0.11	0.15	0.18	0.22
1995	774	0.15	0.05	0.08	0.11	0.14	0.17	0.22
1996	740	0.14	0.06	0.06	0.09	0.13	0.17	0.22
1997	737	0.12	0.05	0.06	0.08	0.11	0.15	0.19
1998	724	0.13	0.07	0.04	0.08	0.12	0.17	0.22
1999	662	0.15	0.07	0.06	0.10	0.15	0.20	0.25
2000	710	0.18	0.09	0.08	0.12	0.18	0.24	0.31
2001	729	0.16	0.08	0.08	0.11	0.15	0.20	0.26
Mean	785	0.21	0.07	0.12	0.16	0.20	0.25	0.30
Total	21,183	0.21	0.10	0.09	0.13	0.19	0.27	0.35

We use the ex-ante cost of equity capital estimated in Brav *et al.* (2005). We thank the authors for providing us with the estimates. These estimates are the same used in Francis *et al.* (2004) and are calculated based on Value Line analysts' forecasts by solving the following equation:

$$(1+r^{VL})^4 = \frac{TP}{P} + \frac{DIV \left[\frac{(1+r^{VL})^4 - (1+g)^4}{r^{VL} - g} \right]}{P}$$

Where r^{VL} is the ex-ante estimate of the cost of equity capital, TP is the Value Line four year out target price, P is stock price nine days prior to the date of the Value Line report, DIV is the Value Line forecast of next year dividends and g is the Value Line's forecasted dividend growth rate.

TABLE 3 (continued)

Panel B: Descriptive statistics of the variables of interest

Variable description	Variable name	Mean	St. Dev	p10	p25	p50	p75	p90
<i>Risk proxies:</i>								
Beta	Beta	1.04	0.41	0.52	0.79	1.04	1.29	1.54
Size	Size	6.24	1.71	4.06	5.02	6.22	7.39	8.48
Book-to-Market	Book-to-Market	0.82	0.62	0.27	0.42	0.66	1.01	1.52
Total risk	StdRet	0.35	0.14	0.19	0.25	0.32	0.42	0.53
Momentum	Momentum	0.10	0.32	-0.29	-0.08	0.11	0.29	0.47
Leverage	Leverage	1.29	1.81	0.19	0.39	0.85	1.56	2.64
<i>Innate earnings determinants:</i>								
Log of Assets	LogAssets	6.65	1.49	4.77	5.52	6.56	7.68	8.67
Cash flow variability	StdCFO	0.06	0.03	0.02	0.03	0.05	0.07	0.10
Sales variability	StdSales	0.17	0.13	0.05	0.09	0.14	0.22	0.33
Operating cycle	OperCycle	4.76	0.57	4.05	4.42	4.80	5.15	5.46
Incidence of losses	NegEarn	0.07	0.13	0.00	0.00	0.00	0.10	0.30
Intangibles intensity	Int_Intensity	0.03	0.04	0.00	0.00	0.01	0.04	0.08
Intangibles dummy	Int_Dummy	0.35	0.48	0	0	0	1	1
Capital intensity	Cap_Intensity	0.40	0.22	0.16	0.23	0.35	0.56	0.74
<i>Proxy to measure balance sheet conservatism:</i>								
C-Score	C-Score	0.14	0.28	0.00	0.00	0.07	0.19	0.35
<i>Variables for the Basu (1997) regression:</i>								
Earnings	Earn	0.07	0.13	-0.01	0.05	0.08	0.12	0.19
Returns	Ret	0.25	0.47	-0.25	-0.05	0.18	0.45	0.81

The sample contains 21,183 firm-year observations for the period 1975-2001. Beta is the CAPM beta: market model regression of excess returns on value weighted market excess returns for 60 months (minimum 24 months). Size is the log of market value of equity at the beginning of the year. Book-to-Market is the book-to-market ratio at the beginning of the year. StdRet is the annualized standard deviation of one year of daily stock returns ending at at the beginning of the year. Momentum calculated as in Brav *et al.* (2005) as the log of the buy and hold return for the 11-month period ending one month prior to at the beginning of the year. Leverage is total liabilities divided by market value of equity at the beginning of the year. LogAssets is the log of total assets at the beginning of the year. StdCFO is the standard deviation of the firm's rolling ten-year cash flows from operations ending at the beginning of the year. StdSales is the standard deviation of the firm's rolling ten-year sales revenues ending at the beginning of the year. OperCycle is the log of the sum of the firm's days of receivables and days of inventory at the beginning of the year. NegEarn is the proportion of losses over the prior 10 years. Int_Intensity is the intangibles intensity measured as the sum of research and development and advertising expenses scaled by sales at the beginning of the year. Int_Dummy is an indicator variable that equals 1 if Int_Intensity=0, and zero otherwise. Cap_Intensity is the ratio of the net book value of property, plant and equipment to total assets at the beginning of the year. C-Score is the conservatism index proposed by Penman and Zhang (2002). C-Score is only available for 15,112 observations. Earn is earnings before extraordinary items scaled by lagged market value of equity. Ret is the 15-month buy-and-hold return ending three months after fiscal year end. All variables are winsorized annually at the 1 and 99 percentiles to avoid the effect of outliers.

TABLE 4
Regressions of the *ex ante* estimate of cost of equity capital on risk proxies and innate controls

Independent Variable		Coef.	<i>t-stat</i>	Coef.	<i>t-stat</i>
		Panel A		Panel B	
Intercept		17.27	16.02	13.08	6.52
<i>Risk proxies</i>					
Beta	(+)	2.11	5.24	1.90	4.71
Size	(-)	-0.27	-2.07	-2.07	-5.43
Book-to-Market	(?)	0.60	2.21	-0.72	-2.58
StdRet	(+)	7.06	5.67	7.33	5.52
Momentum	(?)	-4.94	-9.68	-4.58	-9.23
Leverage	(+)	0.38	4.99	-0.02	-0.28
<i>Innate earnings determinants</i>					
LogAssets				1.96	6.27
StdCFO				13.45	7.45
StdSales				0.65	1.30
OperCycle				0.54	2.17
NegEarn				-2.29	-1.52
Int_Intensity				6.83	2.12
Int_Dummy				0.17	1.08
Cap_Intensity				0.50	1.08
Adj. R ²		0.30		0.33	

The sample contains 21,183 firm-year observations for the period 1975-2001. The dependent variable is the Value Line based measure of ex-ante cost of equity capital proposed by Brav *et al.* (2005). Beta is the CAPM beta: market model regression of excess returns on value weighted market excess returns for 60 months (minimum 24 months). Size is the log of market value of equity at the beginning of the year. Book-to-Market is the book-to-market ratio at the beginning of the year. StdRet is the annualized standard deviation of one year of daily stock returns ending at at the beginning of the year. Momentum calculated as in Brav *et al.* (2005) as the log of the buy and hold return for the 11-month period ending one month prior to at the beginning of the year. Leverage is total liabilities divided by market value of equity at the beginning of the year. LogAssets is the log of total assets at the beginning of the year. StdCFO is the standard deviation of the firm's rolling ten-year cash flows from operations ending at the beginning of the year. StdSales is the standard deviation of the firm's rolling ten-year sales revenues ending at the beginning of the year. OperCycle is the log of the sum of the firm's days of receivables and days of inventory at the beginning of the year. NegEarn is the proportion of losses over the prior 10 years. Int_Intensity is the intangibles intensity measured as the sum of research and development and advertising expenses scaled by sales at the beginning of the year. Int_Dummy is an indicator variable that equals 1 if Int_Intensity=0, and zero otherwise. Cap_Intensity is the ratio of the net book value of property, plant and equipment to total assets at the beginning of the year. All variables are winsorized annually at the 1 and 99 percentiles to avoid the effect of outliers. Coefficients and t-statistics are based on Fama and MacBeth (1973) mean annual regressions of a fixed-effects model that uses Fama and French (1997) industry codes as indicator variable.

TABLE 5

Panel A

Mean annual regression results for the Basu (1997) model of income statement conservatism for each decile of cost of equity capital, K
(K = annual decile ranks of r^{VL*} , the proxy for the ex-ante measure of cost of equity capital)

$$\text{Earn} = \beta_0 + \beta_1 \text{Neg} + \beta_2 \text{Ret} + \beta_3 \text{Ret Neg} + \mu$$

K	β_2	t-stat β_2	β_3	t-stat β_3	<i>Conservatism_{PORT A}</i>
0.1	0.05	3.98	0.71	2.67	16.16
0.2	0.06	6.81	0.29	4.36	6.00
0.3	0.03	2.17	0.23	4.40	8.87
0.4	0.04	3.75	0.15	2.41	4.29
0.5	0.05	4.33	0.31	3.48	7.23
0.6	0.05	3.17	0.22	2.87	5.70
0.7	0.06	5.20	0.23	2.83	4.99
0.8	0.05	4.72	0.31	4.64	6.84
0.9	0.04	2.08	0.20	3.44	6.75
1	0.07	4.54	0.22	5.10	3.94

Panel B

Mean annual regression results for the Basu (1997) model of income statement conservatism interacted with K
(K = annual decile ranks of r^{VL*} , the proxy for the ex-ante measure of cost of equity capital)

$$\text{Earn} = \beta_0 + \beta_{01} K + \beta_1 \text{Neg} + \beta_{11} \text{Neg K} + \beta_2 \text{Ret} + \beta_{21} \text{Ret K} + \beta_3 \text{Ret Neg} + \beta_{31} \text{Ret Neg K} + \mu$$

	Predicted sign	Coef.	t-stat	p-value	K	<i>Conservatism_{PORT B}</i>
β_0	?	0.08	13.23	0.00	0.1	9.04
$\beta_{01} K$?	-0.02	-2.82	0.00	0.2	8.44
$\beta_1 \text{Neg}$?	0.00	-0.01	0.99	0.3	7.89
$\beta_{11} \text{Neg K}$?	0.00	0.19	0.84	0.4	7.38
$\beta_2 \text{Ret}$	+	0.04	3.99	0.00	0.5	6.91
$\beta_{21} \text{Ret K}$	+	0.02	1.46	0.08	0.6	6.47
$\beta_3 \text{Ret Neg}$	+	0.34	4.65	0.00	0.7	6.07
$\beta_{31} \text{Ret Neg K}$	-	-0.11	-1.33	0.10	0.8	5.70
					0.9	5.35
					1	5.02
Adj. R ²		p-value of $(\beta_3 + \beta_{31}) < \beta_3 =$		0.01		
		0.20				

The sample contains 21,183 firm-year observations for the period 1975-2001. K is the annual decile ranks of the residuals from Equation 3 (Table 4, Model 2). K = 0.1 (1) indicates low (high) cost of equity capital. Earn is income before extraordinary items scaled by market value at the beginning of the period. Neg is a dummy variable taking value 1 in the case of negative or zero rate of return, and zero otherwise. Ret is the fifteen-month buy and hold annual return ending 3 months after fiscal year end. Regression coefficients and t-statistics are based on Fama and MacBeth (1973) mean annual regressions. All variables are winsorized annually at the 1 and 99 percentiles. *Conservatism_{PORT A}* equals $(\beta_2 + \beta_3) / \beta_2$. *Conservatism_{PORT B}* equals $(\beta_2 + K*\beta_{21} + \beta_3 + K*\beta_{31}) / (\beta_2 + K*\beta_{21})$. Reported p-values are two-sided for coefficients without sign prediction.

TABLE 5 (continued)

Panel C

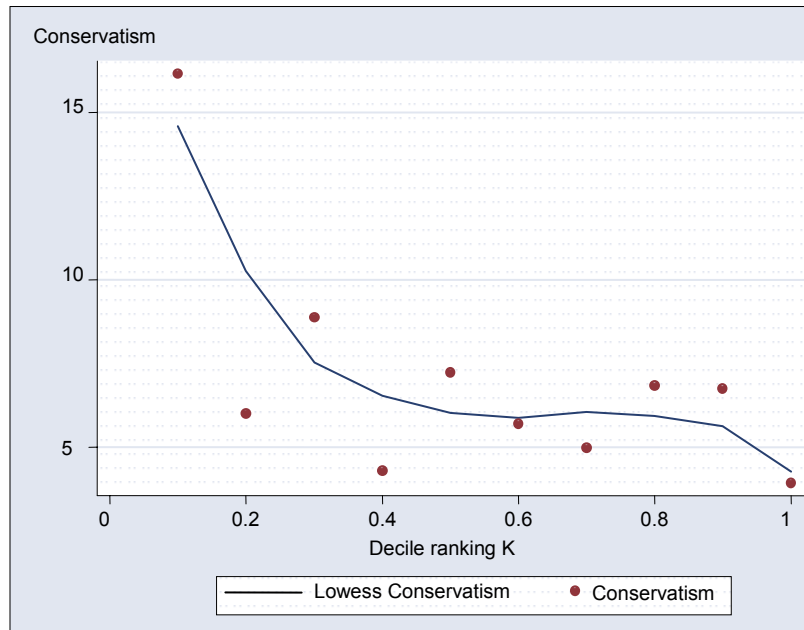
Summary of average conservatism measures of firms ranked by cost of capital decile, K (K = annual decile ranks of r^{VL*} , the proxy for the ex-ante measure of cost of equity capital)

K	Conservatism _{PORT A}	Conservatism _{PORT B}	Average r^{VL}	Average r^{VL*}
.1	16.16	9.04	0.12	-0.10
.2	6.00	8.44	0.15	-0.05
.3	8.87	7.89	0.17	-0.03
.4	4.29	7.38	0.18	-0.02
.5	7.23	6.91	0.19	-0.01
.6	5.70	6.47	0.21	0.01
.7	4.99	6.07	0.22	0.02
.8	6.84	5.70	0.24	0.03
.9	6.75	5.35	0.27	0.06
1	3.94	5.02	0.32	0.10

K is the annual decile rankings of the residuals from Equation 3 (Table , Panel B). Conservatism_{PORT A} is calculated taking the results from the Model in Panel A of Table 5 as $(\beta_2 + \beta_3)/\beta_2$. Conservatism_{PORT B} is calculated from the results in Panel B of Table 5, as $(\beta_2 + \beta_{21}*K + \beta_3 + \beta_{31}*K)/(\beta_2 + \beta_{21}*K)$. r^{VL} is the ex-ante measure of cost of equity capital proposed by Brav *et al.* (2005), and r^{VL*} are the residuals from Equation 3 (Table 4, Panel B).

Panel D

Graphical representation of the trend in Conservatism_{PORT A} when the cost of capital increases



Assessment of the trend in the values of Conservatism_{PORT A}. The figure contains the results of *lowess*, a statistical procedure that carries out a locally weighted regression of Conservatism_{PORT A} on K. The figure was obtained with STATA (version 8) using the command “twoway lowess Conservatism_{PORT A} K.”

TABLE 6
Balance sheet conservatism (C-Score) effect on cost of equity capital

$$r^{VL} = \alpha + \theta \text{ C-Score} + \beta \text{ Risk Proxies} + \gamma \text{ Innate earnings determinants} + u$$

Independent Variable	Coef.	<i>t-stat</i>
Intercept	14.57	6.53
C-Score	-1.26	-2.15
Beta	1.92	4.48
Size	-2.19	-5.66
Book-to-Market	-0.92	-3.17
StdRet	7.03	5.51
Momentum	-4.43	-9.04
Leverage	0.04	0.52
LogAssets	2.05	6.18
StdCFO	13.71	7.42
StdSales	0.61	1.06
OperCycle	0.32	1.03
NegEarn	-2.85	-1.63
Int_Intensity	11.20	2.55
Int_Dummy	0.01	0.05
Cap_Intensity	0.18	0.32
Adj. R ²	0.33	

The sample contains 15,112 firm-year observations for the period 1975-2001. The reduction in sample size is occasioned by missing values of the C-Score. The dependent variable, r^{VL} , is the Value Line based measure of *ex ante* cost of equity capital proposed by Brav *et al.* (2005). C-Score is the conservatism index proposed by Penman and Zhang (2002). Beta is the CAPM beta: market model regression of excess returns on value weighted market excess returns for 60 months (minimum 24 months). Size is the log of market value of equity at the beginning of the year. Book-to-Market is the book-to-market ratio at the beginning of the year. StdRet is the annualized standard deviation of one year of daily stock returns ending at the beginning of the year. Momentum calculated as in Brav *et al.* (2005) as the log of the buy and hold return for the 11-month period ending one month prior to at the beginning of the year. Leverage is total liabilities divided by market value of equity at the beginning of the year. LogAssets is the log of total assets at the beginning of the year. StdCFO is the standard deviation of the firm's rolling ten-year cash flows from operations ending at the beginning of the year. StdSales is the standard deviation of the firm's rolling ten-year sales revenues ending at the beginning of the year. OperCycle is the log of the sum of the firm's days of receivables and days of inventory at the beginning of the year. NegEarn is the proportion of losses over the prior 10 years. Int_Intensity is the intangibles intensity measured as the sum of research and development and advertising expenses scaled by sales at the beginning of the year. Int_Dummy is an indicator variable that equals 1 if Int_Intensity=0, and zero otherwise. Cap_Intensity is the ratio of the net book value of property, plant and equipment to total assets at the beginning of the year. All variables are winsorized annually at the 1 and 99 percentiles to avoid the effect of outliers. Coefficients and t-statistics are based on Fama and MacBeth (1973) mean annual regressions of a fixed-effects model that uses Fama and French (1997) industry codes as indicator variables.