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USEFULNESS OF ACCOUNTING INFORMATION IN FIRM VALUATION*

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ABSTRACT:

The discounted cash flow method of firm valuation accounts for risk through the discount rate or in expected cash flows. A problem arises, however, when the company has no quotes or the market is illiquid. The accounting literature has tried to estimate this rate or cost of capital from accounting information, using the accounting beta to capture company risk, but the results have been inconclusive. Empirical studies have also analyzed expected cash flows from stochastic discount factors but, given the technical difficulty involved, they are scant. This empirical study uses the stochastic discount factor approach to test the usefulness of accounting information as a predictor of expected and neutral risk cash flows. Using a sample of companies from the Standard and Poor's 500 index from 1996 to 2016, we verify that, with a confidence level of 85%, the best explanatory accounting items are capital expenditures, operating earnings per share, and interest. In addition, for companies without optimal statistical adjustment, we reject the clean surplus relation and confirm the presence of accounting conservatism

KEYWORDS: accounting cash-flows; valuation firms; stochastic discount factor; clean surplus; accounting conservatism.

JEL: C23; G12; G32; M41.

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1. INTRODUCTION

A firm's valuation requires considering its expected payoffs (in the numerator) and the discount rate (in the denominator). Financial valuation uses dividends as expected payoffs. Feltham and Ohlson (1999) use clean surplus accounting to substitute out dividends for book values and determine the resulting residual income. This substitution is important because it expresses a link between accounting numbers and asset pricing theory. However, as Lyle (2016) and Penman (2016) note, this substitution has a drawback, since clean surplus accounting is only an accounting relation between the income statement and the balance sheet and depends on the accounting numbers measured. Consequently, only an infinite-horizon residual income model can calculate firm value via expected dividends.

Regarding the discount rate, while the cost of capital is the key issue in asset pricing research in finance, it has been less studied in the accounting literature. Additionally, most firms are private and the ability to obtain risk-based measures of the cost of capital is crucial to their optimal decision making. However, since private firms do not have stock prices to over- or underreact to, they are less dependent on investor sentiment and less subject to investor undervaluation.

Then, if a company's stock is not traded on the market or if the market is not liquid, the company's cost of capital will not be possible to estimate. In such cases, the financial literature suggests using the accounting beta as a proxy for the capital asset pricing model (CAPM) market beta or the cash flow beta, according to the earnings recognition principle of accounting. To estimate the implicit cost of capital in these cases, the accounting information represents an important predictor of a company's future cash flow and serves to assess the risk of stock investments. A question is then raised that justifies this work: Is accounting information useful in the valuation of an unlisted firm or one quoted on an illiquid market? The financial and accounting literature addressing this question is vast and ongoing but fundamentally focused on estimating the cost of capital (denominator).

Beaver et al. (1970) regress a measure of accounting return on the excess return of the market index or systematic risk, but their empirical results on the correlation between accounting and market betas are inconclusive. Gonedes (1975) finds possible spurious correlations; Ismail and Kim (1989) demonstrate the explanatory power of cash flow, and Baginski and Wahlen (2003) and Nekrasov and Shroff (2009) find a weak relation between the accounting and market betas. Mensah (1992) examines the relation between the market beta and accounting risk measures and finds that the market beta can be represented by intrinsic business risk, operating leverage, and financial leverage, as in the model of Mandelker and Rhee (1984).

Under the clean surplus relation, Easton et al. (1992) and Penman and Yehuda (2009) separate return rates into forecast components for the expected earnings yield, the expected percentage change in the market value of equity, and the expected change in the book value of equity with respect to the current market value. Penman (2016) notes that this approach allows the estimation of long-run expected rates of return on capital based purely on a firm's accounting information dynamics and without reference to its stock price, avoiding the circularity problem of using a reverse-engineered internal cost of capital.

Cohen et al. (2009) show that the accounting beta is able to explain long-horizon returns. Campbell et al. (2010) find that the accounting beta is a weak predictor of the market beta.

He et al. (2013) show that information plays an important role in determining the cost of equity capital, such that firms with the most transparent disclosure exhibit a decrease in their cost of equity relative to the least forthcoming firms. The authors note different methods of computing the cost of equity. As expected, the methods depend on how the cash flows are estimated, which is a function of the accounting variables as payout, dividends, earning per share, book value, and growth rate, among others.

Sarmiento-Sabogal and Sadeghi (2015) estimate eight different accounting returns. They find that the accounting beta overestimates the market beta by 20–50% and, by applying corrective measures, such as operational earnings scaled by equity, they can lessen this difference to 22–25% but cannot eliminate the error. Ohlson and Johannesson (2016) consider market and accounting information jointly and find that the residual income valuation model lacks empirical support, even when it includes market risk (via the CAPM beta).

Additionally, Easton (2007) notes that one problem with using valuation models with discounted cash flows is that the discount rate and the growth rate of cash flows are estimated together. This approach becomes more uncertain when clean surplus accounting is assumed, since the interrelation between the two rates is unknown. So, if the return on equity converges to the cost of capital, the market value converges to the book value and the residual income will be zero, as will its growth rate. Therefore, both the growth rates and expected rates of return are those implied by the data.

Based on the above, this study aims to change the approach and, instead of testing whether accounting information is useful in determining the discount rate (denominator) used in the valuation of companies, the objective is to analyze the utility of this information in the estimation of expected cash flows (numerator).

The remainder of the paper is organized as follows: Section 2 reviews the literature and presents the hypotheses. Section 3 describes the methodology and research design. Section 4 discusses the data. Section 5 analyzes the empirical results and Section 6 presents our concluding remarks.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Beaver and Manegold (1975) find a statistically significant association between market betas and accounting betas measured under a variety of specifications, where net income-to-market value betas appear to have greater explanatory power than pure accounting betas. However, the accounting beta appears to be only one of the explanatory factors.

Kothari (2001) researches the relation between capital markets and financial statements and determines at least four areas with a demand for capital market research in accounting that explain its popularity: (i) fundamental analysis and valuation, (ii) tests of capital market efficiency, (iii) the role of accounting in contracts and in the political process, and (iv) disclosure regulation. Therefore, the state-of-the-art estimate of the cost of equity (relative risk times the sum of the risk premium and the risk-free rate) is extremely imprecise. The cost of equity is then defined as the discount rate that equates the price to the fundamental value, that is, the sum of the book value and the discounted residual income stream. Potential reasons for both risk mismeasurement and omitted risk factors resulting in misestimating the expected returns of securities in a long-horizon event study are a serious concern. Stated differently, discriminating between market inefficiency and a bad model of expected returns is difficult in long-horizon event studies.

Following Vuolteenaho (2002), Easton and Monahan (2005) have developed an empirical approach to evaluating the reliability of the estimates of the expected rate of return on equity capital, using seven accounting-based proxies. Their results show that, for a cross section of firms, none of these proxies has a positive association with realized returns, after controlling for changes in expectations about future cash flows and future discount rates. The authors show a higher percentage (43.5%) of observations below the risk-free rate and provide a simple demonstration of the lack of validity of the realized return as a measure of the expected return. Easton and Monahan then conclude that an analyst-based internal cost of capital is not a reliable proxy for expected returns and they attribute the lack of reliability to the quality of analysts' earnings forecasts.

However, Zhang (2000) has previously shown two important opposite determinants of the difference between return on equity and the market's expected rate of return on equity: (1) long-term growth in investments and (2) accounting conservatism. Under conservative accounting, the expected return on equity approaches the expected rate of return on equity over time but remains above it; as the difference between the return on equity and the expected return declines, the residual income will also decline. However, a countervailing effect is the growth in investments, which increases the base on which residual income is generated.

Along this same line of research, for each company of their sample, Schlueter and Soenke (2014) show that the CAPM beta market risk depends on different risks (growth, spread, income, productivity, operating, and financial risks). Therefore, to analyze the impacts of firm-specific accounting figures, one should link each company's market beta to its accounting-based beta, replacing its market return by its accounting financial return (net income during the fiscal year deflated by the market value at the beginning of the fiscal year).

Easton (2007) describes how accounting-based valuation models have been used and how they could be used to obtain estimates of the cost of capital. The author notes that estimations based on historical return data have empirical problems that likely invalidate their use in applications. This context reveals the practical appeal of accounting-based valuation models in using forecasts of earnings and of earnings growth. Specifically, Easton describes two methods of assessing the quality/validity of firm-specific estimates, by answering the following questions:

1. Do the estimates of ex ante expected returns explain ex post realized returns?

2. What is the correlation between the estimates of the expected rate of return and common risk proxies?

The second method, however, has serious shortcomings and Easton (2007) concludes that, after controlling for omitted correlated variables, the method that relies on explanatory power for ex post realized returns is the best method for the evaluation of the estimates.

Hughes et al. (2009) examine the relation between the implied cost of capital and expected returns under the assumption of stochastic expected returns. They find that the implied cost of capital differs from expected returns, on average, and that this difference is a function of leverage, cash flow growth, beta volatility, cash flow volatility, and the correlation between expected returns and the implied cost of capital.

A problem therefore lies in estimating expected returns. Botosan et al. (2011) use 12 proxies, but their results are conditioned by the choice of factors. Hou et al. (2012) use earnings forecasts from a cross-sectional model to proxy for cash flow expectations and estimate the implied cost of capital. Their results show a more reliable proxy for expected returns than the implied cost of capital based on analyst forecasts and they find such evidence in the cross-sectional relation between firm-level characteristics (dividends, assets, and accruals) and ex ante expected returns.

Cooper and Priestley (2016) were the first to examine the valuation of private firms and compare it with that of public firms. Cochrane (1991) shows that investment returns are equal to the stock returns of an unlevered firm. Cooper and Priestley (2016) note that, if a factor that is related to returns is a "true" risk factor, then a necessary condition is that it be a source of aggregate uncertainty that affects all firms in the economy. The authors analyze public and private industries, but not individual firms. Then, using investment returns, they obtain the estimates of the cost of capital of private firms from asset pricing models. The factors used are the market portfolio, the investment-to-capital ratio, the return on assets, size, and the idiosyncratic volatility of returns. The results show that private industries have valuation ratios and a cross-sectional variation of valuation ratios that are similar to those of public industries.

Pope and Wang (2005) show the irrelevance of the earnings component in valuation, even when it is predictable. They assume no arbitrage, clean surplus accounting, a linear valuation, and the irrelevance of dividends. Additionally, they study the possibility of accounting conservatism. So, if the accounting is unbiased, then the book value and the market value are asymptotically equal: $\mathrm{E}_t\left(P_{i,t+s} - y_{i,t+s}\right) \rightarrow 0$ as $s \rightarrow \infty$. However, if the accounting is conservative, then $\mathrm{E}_t\left(P_{i,t+s} - y_{i,t+s}\right) > 0$ as $s \rightarrow \infty$.

In addition, the irrelevance of dividends assumes that the payment of dividends reduces firm value dollar for dollar. However, the effect of dividend payout on expected future earnings depends on the accounting properties. Thus, the dependence of abnormal earnings dynamics on the firm's rate of growth has implications for the displacement effect of dividends on future earnings (dividend displacement). In other words, when accounting is conservative, a dollar of dividends reduces one-period-ahead expected earnings by less than the cost of equity. Equivalently, conservative accounting causes the marginal accounting rate of the return on a dollar of retained earnings to be less than the economic rate of return.

Abudy et al. (2016) point out that the cost of equity for private firms is an increasing function of a firm's asset risk, investor or owner degree of non-diversification, and leverage ratio and a decreasing function of taxes, which are defined as idiosyncratic risk. Although the financial literature (Finnerty, 2012) assumes a complete market in which only part of a firm's securities are tradable, Abudy et al. (2016) assume the absence of a marketplace for all firm securities, but this proposal considers that the down and up probabilities for both listed and unlisted companies are equal to the risk-free discount factor, so the values are arbitrage free opportunities; then the model defines non-tradable firms' probabilities equal as the listed companies more a spread. The following question then arises from this approach: Is the absence of a market the same as an incomplete market? This is an important distinction, since, if the market is incomplete, hedging is not possible and there is no unique price. So, there are as many implicit capital costs as possible values. In short, the complete market hypothesis is necessary and not the absence of a market.

Christodoulou et al. (2016) show how the expected rate of return on equity, extracted from a residual income model, could be estimated using only published accounting results, based on the information dynamics of reported earnings. However, the authors define abnormal earnings in relation to a risk-adjusted discount rate of return, as opposed to the risk-free rate, as advocated in research reviewed by Callen (2016). Additionally, Christodoulou et al. assume compliance with the clean surplus relation and a linear information model (i.e., earnings follow an autoregressive process of order one).

Easton and Monahan (2016) point out that using accounting data to estimate the expected rate of return on equity makes two assumptions: First, no realized returns are a reliable measure of expected returns and, second, the factors that determine expected returns are unknown and/or cannot be reliably estimated. To avoid problems of consistency with the model, this last assumption should be eliminated from any estimation proposal; the results of the estimation thus cannot be subject to the underlying model (CAPM or other). This is a consequence of concerns over data mining and spurious inference brought forth by the proliferation of risk factors identified in the literature on empirical asset pricing.

In this context, the implied cost of capital is the solution of accounting and finance for addressing the deficiencies of expected return estimates based on realized returns. This internal rate of return is the discount rate that the market uses to discount firm expected cash flows. Its main advantage is that it does not rely on noisy realized returns or on any specific asset pricing model.

So, Barth et al. (2001) show the cash flow and accrual components of current earnings have substantially more predictive ability for future cash flows than several lags of aggregate earnings and, Barth et al. (2016) find empirical evidence about that partitioning accruals, based on their role in cash-flow alignment, increases their ability to forecast future cash flows and earnings which explain firm value.

Then, basically, the stock intrinsic value (*V*) is typically defined as a present value:

$$V_t = \sum_{j=1}^{\infty} \frac{\mathrm{E}_t\left(D_{t+j}\right)}{\left(1+k\right)^j} \tag{1}$$

where $\mathrm{E}_t\left(D_{t+j}\right)$ is the expected future dividends based on currently available information and *k* is the cost of capital.

If clean surplus relation is satisfied, then expression (1) can be rewritten in terms of residual income:

$$V_t = B_t + \sum_{j=1}^{\infty} \frac{\mathrm{E}_t\left[\left(ROE_{t+j} - k\right) \cdot B_{t+j-1}\right]}{\left(1+k\right)^j} \tag{2}$$

where *B* is book value and *ROE* is the return on equity. Expression (2) provides a framework for analyzing the relation between accounting numbers and stock market value (*P*).

From clean surplus relation, as Frankel and Lee (1998) point out, this model only needs three variables: cost of capital (*k*), expected (*ROE*) and dividend payout ratio (*d*):

$$B_{t+j-1} = B_{t+j-2} \cdot \left[1 + \left(1-d\right) \cdot ROE_{t+j-1}\right] = B_t \cdot \prod_{s=1}^{j-1} \left[1 + \left(1-d\right) \cdot ROE_{t+s}\right] \tag{3}$$

Replacing expression (3) into (2) results:

$$V_t = B_t + \sum_{j=1}^{\infty} \frac{B_t \cdot \mathrm{E}_t \left[\left(ROE_{t+j} - k \right) \cdot \prod_{s=1}^{j-1} \left[1 + \left(1 - d \right) \cdot ROE_{t+s} \right] \right]}{\left(1 + k \right)^j} \qquad (4)$$

Then, unlike the aforementioned literature and to avoid drawbacks related to the cost of implicit capital and the rate of payout, the aim is to study the accounting figures usefulness, but under the assumption that intrinsic value is a free-arbitrage opportunities price according to financial theory.

In this context, we assume a complete market with standard accounting rules where there is a single price (with absence of arbitrage opportunities) and therefore:

$$\begin{aligned} & i = 1, \ldots, N \\ & R_{i,t} = \ln\left(P_{i,t}\right) - \ln\left(P_{i,t-1}\right) \\ & 1 = \mathrm{E}_t\left[M_{t+1} \cdot \left(1 + R_{i,t+1} \right) \right] \end{aligned} \qquad (5)$$

where *i* is each stock traded in the market, *M* is the stochastic discount factor (SDF hereafter), *P* is the market price, *R* is market return of stock traded, and *t* represents the time variable.

If we estimate *M* from the traded stocks and the market is composed of *H* assets, where only *N* (*N* ≤ *H*) are traded, then we would value any asset such as:

$$\begin{aligned} & h = 1, \ldots, N, \ldots, H \\ & P_{h,t} = \mathrm{E}_t\left[M_{t+1} \cdot X_{h,t+1} \right] \end{aligned} \qquad (6)$$

where *X* are expected cash-flows.

At this point, empirical research on the usefulness of accounting information focuses on the implicit risk factors of the SDF:

$$
\begin{aligned}
M_{t+1} &= \delta_0 + \sum_{s=1}^{S} \delta_s \cdot F_{s,t+1} \\
\delta_0 &= \frac{1}{1+Rf} + \sum_{s=1}^{S} \frac{\gamma_s \cdot \mathrm{E}_t(F_{t+1})}{(1+Rf)\cdot \sigma_s^2} \\
\delta_s &= \frac{\gamma_s}{(1+Rf)\cdot \sigma_s^2}
\end{aligned}
\qquad (7)
$$

where *F* is the return of each risk factor *s*, *Rf* is risk-free rate, σ_s^2 is the variance of factor return *s* and, γ_s is the risk premium or $(F_s - Rf)$. Note in (7) that if *S*=1, then CAPM is applied. So that, expected return is expressed as follows:

$$
\mathrm{E}_t(R_{i,t+1}) = Rf + \sum_{s=1}^{S} \gamma_s \cdot \beta_{i,s} \qquad (8)
$$

Finally, on expression (8) the accounting literature on implicit cost of capital and accounting beta study the contribution of accounting information. Sometimes, however, expectations or expected values are used instead; that is, the fiscal year's accounting figures are mistakenly assumed to be observed at the beginning of the period.

But, our aim focus in expression (6), that is, if we estimate SDF from listed firms returns then, we would obtain the expected cash-flow as $X_{i,t+1} = P_{i,t} \cdot M_{t+1}$ and we could later analyze whether the accounting figures are able to explain theses cash flows. Therefore, this approach is a novel contribution to the accounting literature and our question is as follows: Is accounting information useful in estimating the expected cash flows used for firm valuation? For empirical testing, we reformulate this as the following hypotheses.

H-1. The expected risk-neutral cash flows of companies are explained by accounting figures.

H-2. The clean surplus relation and the effect of accounting conservatism influence the explanatory power of the expected cash flows by the accounting items.

3. METHODOLGY AND RESEARCH DESIGN

Gosh et al. (2017) show how the pricing kernel can be estimated in a nonparametric fashion under no-arbitrage conditions (Euler equation). In particular, given the time series data of returns on a cross-section of assets, they use a model-free relative entropy minimization approach to estimate a SDF that prices the given cross-section. This approach does not require taking a stance on either the number or the identity of the underlying risk factors or on the functional form of the pricing kernel. Instead, the approach allows us to conveniently summarize all the relevant information contained in, possibly multiple, priced risk factors in the form of a single time series for the SDF. Therefore, a non-parametric approach to the recovery of the pricing kernel is a potentially valuable alternative to the ad-hoc construction of risk factors, and provides a model-free test of the efficient market hypothesis. Moreover, it provides a benchmark model relative to which both competing theories, as well as investment strategies, can be evaluated.

For Gosh et al. (2017), the function to be optimized is defined as:

$$\arg\min_{\vartheta} \frac{1}{T}\sum_{t=1}^{T}\exp\left(\vartheta' \cdot R_t^e\right) \quad (9)$$

where R_t^e is the history ($t = 1,\ldots,T$) of excess returns on risk-free rate (Rf) for N ($i = 1,\ldots,N$) listed companies, ϑ is the vector of Lagrange multipliers that solve the unconstrained convex problem and, SDF is estimated as:

$$M_t = \frac{\exp\left(\vartheta' \cdot R_t^e\right)}{\frac{1}{T}\sum_{t=1}^{T}\exp\left(\vartheta' \cdot R_t^e\right)} \quad (10)$$

Following Gosh et al. (2017), we use the above method to recover the time series of the SDF in a rolling out-of-sample fashion. In particular, for a given cross section of asset returns, we divide the time series of returns into rolling subsamples of length *T* and, in each subsample, estimate the vector of Lagrange multipliers by solving the minimization in equation (9). Using these estimated parameters, the out-of-sample information SDF is obtained for the subsequent each period using equation (10). And finally, we obtain the expected cash-flow as $\mathrm{E}_t\left(X_{i,t+1}\right)=\frac{P_{i,t}}{\mathrm{E}_t\left(M_{t+1}\right)}$ for each firm and fiscal year of the sample.

To verify the robustness of the results for listed and private firms, this methodology is applied *N*+1 times: first, once using *N* firms (whole sample) and, afterward, *N* times for *N*-1 firms, where a different company is excluded from the sample each time. Note that, by excluding firm *i*, we assume not that it is not quoted but, rather, that the effect on market risk is captured by the relations with the remainder of the listed companies included in the subsample. Then we obtain *N*+1 SDFs: one SDF estimate using the whole sample ($M_{N,t+1}$) and *N* SDFs that exclude firm *i* from each estimate ($M_{N-i,t+1}$). Similarly, we obtain *N*+1 expected cash flows for each company: for the entire sample, ($\mathrm{E}_t\left(X_{i,t+1}^{N}\right)=\frac{P_{i,t}}{\mathrm{E}_t\left(M_{N,t+1}\right)}$) and, for each subsample that excludes a company, ($\mathrm{E}_t\left(X_{i,t+1}^{N-i}\right)=\frac{P_{i,t}}{\mathrm{E}_t\left(M_{N-i,t+1}\right)}$).

Next, to test the hypothesis on accounting information useful to estimate the expected cash flows (*X*), we use the following panel data model:

$$\begin{gathered} j = N, N-1, N-2, \ldots, N-N \\ \mathrm{E}_t\left(X_{i,t+1}^{j}\right)=\alpha_{0,j}+\sum_{k=1}^{K}\alpha_{k,j}\cdot Z_{i,t}+u_{i,t+1}^{j} \end{gathered} \qquad (11)$$

where *Z* are regressors grouped into two types: the value per share[2] of accounting indicators and, control dummies variable for time and industry. So that, if $\alpha_{0,j} \neq 0$ then, we reject the hypothesis H-1, since the prediction error of the expected cash flows through the accounting information does not have a zero mean.

4. DATA

The firms selected are from the Standard & Poor's (S&P) 500 index. The auditing and yearly accounting data for fiscal years 1996 to 2016 are obtained from Compustat. The monthly market prices of the firms are from Bloomberg (from January 1986 to December 2016) and the risk-free rate (*Rf*) and the market premium are from Kenneth French's online data library,[3] where *Rf* is the one-month T-bill return from Ibbotson and Associates.

Regarding the accounting indicators, our aim is to contrast those commonly used in the valuation of companies and, as Barth et al. (2001), use the cash flow and accrual components of current earnings. We therefore consider the following (in US dollars per share): total assets, book value, capital expenditures (CAPEX), depreciation, operational earnings per share (EPS), non-operational EPS, interest, current liabilities, non-current liabilities, dividends, cash, changes in working capital, and revenues. Industry (Global Industry Classification Standard, or GICS) and year dummies are also included.

Table-1 shows the main statistical indicators of the annualized return excesses on the risk-free rate for the period 1996-2016, since these are the years on which we will analyze the usefulness of the accounting information.

[Insert around here Table-1]

Note that the number of companies for which both accounting and market information is available changes each year.

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[2] Since estimates of the expected cash-flows are expressed in terms of share price. In this way, we also avoid the scale effect.

[3] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Meanwhile, the descriptive statistic of accounting data is in Table-2 Panel-A and, the correlation matrix among them in Table-2 Panel-B.

[Insert around here Table-2]

The sample is therefore an unbalanced panel data, with heterogeneous individuals (high statistical moments) and an issue with multicollinearity; that is, it is a typical accounting sample.

5. EMPIRICAL RESULTS

Initially, the expected discount factor for each year from 1996 to 2016 is calculated. As described above, each estimation uses the monthly return excesses of the previous 10 years, that is, for example, for the first estimate (December-1996) the excess monthly returns are from January-1985 to December-1995, and so on for each year. In addition, this estimate is run N+1 times each year: one for all companies of the sample and, other N estimates excluding one company each time.

The objective of this procedure is twofold: on the one hand, to check the validity of the methodology to value private companies, and on the other, to test the robustness of the results.

Table-3 shows the implicit rates (1/SDF) of the expected SDF estimates versus risk-free rate for each year.

[Insert around here Table-3]

Note that the SDFs obtained by excluding a company from the sample are volatile and even the median (second quartile, or Q2) diverges from the estimate of the whole sample. This result justifies the proposed double estimation procedure to study the robustness of the results.

Table-4 shows a descriptive statistic of the expected cash flows estimated from the stock price of each company at the beginning of the fiscal year and the risk-free rate of year versus expected stochastic discount factors, calculated previously. So, the estimate is: $E_t(X_{i,t+1}) = \frac{P_{i,t}}{E_t(M_{t+1})}$.

[Insert around here Table-4]

Next, we address the problem of multicollinearity among the accounting variables (regressors). To avoid this and also select the most significant variables, we make two previous estimates: first and for the set of companies (pooled), we run ordinary least squares (OLS) regressions for each accounting item on cash flow expectations (Table 5) and, second, we perform the same regressions, but individually for each company in the sample (Table 6) to check the number of companies for which each regressor is statistically significant (*firms signif.*).

[Insert around here Table-5]

[Insert around here Table-6]

From results on Table-5, we remark that some accounting variable have a low individual explanatory power. We therefore exclude these from the final model to avoid multicollinearity: *book value*, *dividends*, *Earnings Per Share non-operating*, *current liabilities* and *working capital changes*. This result is relevant since these variables are usually used, in the accounting literature, for the valuation of companies or the estimation of the cost of capital (book, dividends or working capital changes, as a component of Free Cash-Flow). So, our results show that these accounting variables are not explanatory of expected cash-flow.

Table-6 show that median explanatory power (R^2) by individual firms is low (4%-18%) and, that there is a high distance between third quartile (Q3) and maximum value of R^2. These results suggest that these accounting items generally have low individual explanatory power but high value explanatory for some firms. We therefore have panel data with individual effects.

The individual effects in panel data can be modeled as either random or fixed effects. If the individual effects are correlated with the other regressors in the model, the fixed effect model is consistent and suitable estimation method is OLS . On the other hand, if the individual effects are not correlated with the other regressors in the model, both random and fixed effects are consistent but random effects is efficient and consistent estimation method is GLS. The Hausman test is a measure of distance between both estimations with asymptotic behaviour to Chi-square (with freedom degree as number of regressors) and, the null hypothesis is GLS is a consistent estimation, so if p-value is less than 0.05 then, the null is rejected and fixed effects (OLS) is the consistent estimation. The results of Hausman test for both sample (whole and N-1 firms) are 149.73 (p-value=0.000) and 120.06 (p-value=0.000) respectively, so that OLS estimation or fixed effects is consistent.

Once we have made the first selection of possible accounting regressors and identified a new problem (individual effects), we study the temporal and industry effects. For this, we include significant accounting items and year and industry dummies (as well as multiplicative effects) in the model. The results are shown in Table 7.

[Insert around here Table 7]

From the results of Table-7 panels A and B, we observe a temporary effect in the series with a clear statistical effect on the balance sheet variables (*asset, cash* and *no current liabilities*). In Table-7 panel-B, when balance sheet items are excluded, the *dummy 2008-2011* is no statistically significant. This shows that the temporary effect on temporal series has a stronger effect on the stock variables (balance sheet) than on the variables flow (profit and loss), which is a direct consequence of the accounting process itself, since the balance sheet items accumulate from one year to the next (which means that they are not, by definition, stationary), while profit and loss items start each financial year with a zero balance.

If we now analyze the results in Panels B and C of Table 7, we can verify two points: first, the variable *depreciation* is not significant; that is, another component of the most common indicators of cash flow is ruled out from being an explanatory variable of the expected cash flow. Also, we observe that when decomposing *Earning Per Share operating* in *Revenue* and *Expenses*, the *Revenue* are not statistically significant.

In short, the expected cash-flows show temporary and individual effects, but no, industry effect. And, the balance sheet items interact with temporary effects, which incorporates new problems of multicollinearity and lack of consistency of results. Finally, only some elements of the most common cash flow measures are significant: *CAPEX, Earnings Per Share operating* and *Interest*.

Therefore, we estimate the model again but only including the significant variables. In addition, how these variables intervene in the calculation of Equity Cash-Flow, we check the relation between this cash-flow measure and the expected cash-flow. The results are in Table-8.

[Insert around here Table-8]

The results of Panel A of Table 8 show that *constant* is not statistically significant and the explanatory power of the expected cash flow is around 75%. In addition, the lack of autocorrelation between residuals indicates that model misspecification and even endogeneity problems are not an issue here. Since significant regressors are part of equity cash flow, we define the expected equity cash flow (*ECFE*) as the *EPS operating* minus the *CAPEX* plus interest, but the results in Panel B show that reducing the interest weight also decreases the explanatory power (which is higher than one in Panel A and equal to one in Panel B). Finally, Panel-C show that Expected Equity Cash-Flow explains about 80% of next year´s Equity Capital Cash-Flow. In short, the most consistent estimate of the cost of capital with these results is $\mathrm{E}_t\left(K_{i,t+1}\right)=\frac{ECFE_{i,t}}{P_{i,t}}$, where *P* is stock market price and *K* is cost of capital.

So, the implicit accounting beta in this rate can also be used to compare the usefulness of the accounting information: $\beta_{i,A} = \frac{E_t(K_{i,t+1}) - Rf_t}{E_t(RP_{t+1})}$, where *RP* is market risk premium and *Rf* risk-free rate. Table-9 show relation between this accounting beta and Capital Asset Pricing Model (CAPM) beta.

[Insert around here Table-9]

From results on Table-9, we observe that accounting beta only explains about 20% of CAPM market beta and its weight is 0.35, while *constant* (not explained) is higher (0.65). Thus, these results give validity to the empirical approach of this study, since directly analyzing the relationship between accounting variables and market betas presents problems of inconsistencies in terms of expectations and the implicit valuation model (is CAPM always the most appropriate model?).

Throughout the results of the empirical study, we have thus observed that a high percentage (75%) of the expected cash flow is explained by three accounting items (CAPEX, EPS operating, and interest) and the null constant. At this point and to analyze the validity of the results, we re-estimate the model, but for three different subsamples, and we group the firms in each subsample according to the individual estimation of the model, as follows: the first subsample is made up of companies that, in this individual regression of the model, show a null constant; the second subsample is formed by companies with a non-null constant, that is, those in which we have not identified all the significant regressors; and, finally, a third subsample is comprised of those companies whose constant is not null and that are in the original sample of *N*-1 companies but not in the entire sample of *N* firms.

[Insert around here Table-10]

Table-10 Panel-A shows that the model is valid for most companies (350 out of 492) with a high goodness of fit (R^2 is 85%), which does not increase considerably by including individual effects per company (R^2 is 87%). On the contrary, Panel-B shows that there is a group of companies (142 on the total of 492) whose expected cash-flows require incorporating other regressors into the general model: *Earning Per Share non-operating* and *temporary dummies*. Note that an atypical result, such as the non-operational income, is recurrent in the model and that interest ceases to be significant. Finally, Panel-C results indicate that there are exceptional cases (7 companies on 492) in which the CAPEX also ceases to be significant and the weight of the EPS operating is the same as the EPS non-operating.

In summary, expected cash flows extracted from the SDF are explained by operational results, interest, and investments in CAPEX. However, certain companies show sensitivity to the economic cycle and experience recurrent atypical results. In any case, the usefulness of accounting information in valuing companies cannot be denied and H1 is accepted.

As for companies whose accounting information does not seem to be useful, the following question arises: If we use another valuation method, would we obtain different results? From the literature reviewed above, it is clear that the accounting information must meet certain principles to be defined as useful and, while in the case of market information, the literature has responded with so-called stylized market return facts (Cont, 2001), in the case of accounting information, there is still no consensus on stylized accounting facts. This undoubtedly entails two fundamental drawbacks: on the one hand, the absence of generalized econometric modeling for these elements and, on the other hand, the definition of a set of tests prior to any empirical accounting study that allows one to reliably limit whether the sample complies with the stylized accounting facts.

In this context and without the intention of being exhaustive, two basic principles are clearly required if accounting information is to be useful in the valuation of companies: clean surplus accounting and the absence of accounting conservatism. Therefore, we test whether these accounting principles are met in the two subsamples (H2): companies whose accounting information is useful and those whose results indicate otherwise.

Table-11 shows the results on the clean surplus. We check as in the first sub-sample of the company, for which an explanatory model of the expected cash-flows was found, the clean surplus relation is fulfilled and constant is not statistically significant, both the explanatory variables of the expected cash-flow and the expected cash-flow obtained from the SDF are significant. Unlike, for the sub-sample of companies without an accounting explanatory model, compliance of the clean surplus is rejected.

[Insert around here Table-11]

The results of Table 12 show that the accounting conservatism parameter (β_2) is not significant in the subsample of companies with explanatory models of the expected cash flow but is significant in the subsample without an explanatory model.

[Insert around here Table-12]

In short, clean surplus accounting is accepted and accounting conservatism is rejected for those companies with useful (significant) accounting information in the explanation of their expected cash flows and, therefore, in their valuation. Clean surplus accounting is rejected and accounting conservatism is accepted for those whose accounting information is not useful. Therefore, H2 is also accepted.

6. CONCLUSIONS

A firm's valuation via discount cash flows involves expected payoffs (numerator), the discount rate (denominator), and company risk. Thus, when the discount rate is the cost of capital, the risk is already included. However, if an SDF is used, risk-adjusted expected cash flows must be estimated.

To estimate the cost of capital, we need market data and an implicit asset pricing model. A problem arises, however, for illiquid markets and private firms. In these cases, the accounting literature tries to provide a solution by estimating the risk factor from accounting information, which is where the so-called accounting beta arises. However, empirical results on the usefulness of accounting information in the estimation of the cost of capital are inconclusive.

We propose, instead, to include the risk factor in the expected cash flow. Following Gosh et al. (2017), we therefore use a model-free relative entropy minimization approach to estimate a nonparametric SDF with arbitrage restrictions. The advantage of this approach is that it does not require taking a stance on either the number or the identity of the underlying risk factors or on the functional form of the pricing kernel.

We thus estimate the risk-adjusted expected cash flow from the expected SDF and market price at the beginning of the year. We then seek those accounting items with higher explanatory power for these cash flows. For S&P 500 companies from 1996 to 2016, we find that CAPEX, EPS operating, and Interest explain these cash flows with an R^2 value of 85%. We therefore use a pseudo capital cash flow equity estimate from these accounting items to extract its implicit cost of capital and accounting beta. Next, we study the relation between these accounting betas and the market beta (CAPM). The results show lower dependence (0.35, far from unity), because the accounting information underestimates the market beta, since it does not include all the risk included in the expected cash flows.

Our results show that, for any companies, the EPS non-operating and temporal dummies (for period 1996–2000, 2001–2007, and 2008–2012) are also the explanatory variables of expected cash flows. Given the accounting data of these firms, we reject the clean surplus relation and confirm the existence of the accounting conservatism. The results are therefore opposite the usual assumptions in firm valuation models and the need thus arises for the accounting research to examine more deeply the basic principles that the accounting information has satisfied (stylized accounting facts) before any hypothesis can be tested.

Secondarily, we have verified that including the accounting variables of the balance sheet sometimes assumes model misspecifications as a consequence of the nature of the stock variables, by definition, which capture temporary effects in non-stationary behavior.

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TABLES

Table 1. Descriptive statistics of annual excess stock returns for the sample companies

year	mean	std. dev.	skewness	kurtosis	min	max	observations (firms)
1996	2.2395%	3.2454%	0.3230	2.8797	-12.64%	14.52%	369
1997	3.1955%	3.3869%	-0.2044	2.2628	-13.29%	17.05%	381
1998	2.0992%	4.5645%	0.2876	0.9988	-16.91%	16.60%	391
1999	1.1173%	5.3280%	0.5882	0.6336	-12.50%	17.53%	401
2000	2.3062%	5.4253%	0.0170	0.8132	-15.87%	17.55%	414
2001	0.9574%	4.3205%	0.0902	1.9926	-17.23%	17.63%	427
2002	-0.8718%	3.5078%	-0.4719	2.9904	-16.32%	12.58%	434
2003	4.3170%	3.2944%	1.0771	1.6326	-3.41%	17.46%	436
2004	2.2844%	2.8225%	0.7039	1.8739	-6.07%	14.62%	442
2005	1.3166%	3.2317%	1.1215	3.2189	-7.83%	16.92%	448
2006	1.8093%	2.6237%	1.3304	5.1863	-7.65%	15.09%	456
2007	0.5946%	3.9274%	-0.1176	2.1665	-17.77%	16.42%	461
2008	-4.2736%	3.7986%	-0.2229	1.1237	-17.30%	10.31%	464
2009	4.8674%	3.9063%	0.4794	1.0141	-12.33%	16.63%	467
2010	2.9430%	2.8320%	0.6140	1.5680	-6.48%	15.91%	468
2011	0.6060%	2.8518%	-0.5992	1.6728	-13.38%	9.66%	477
2012	2.4564%	2.5609%	1.1111	5.1029	-7.00%	16.79%	480
2013	3.9351%	2.6961%	0.5394	2.8566	-7.21%	16.81%	485
2014	2.0335%	2.4507%	0.3222	3.5832	-9.77%	15.34%	486
2015	0.0411%	3.0456%	-0.7615	3.0957	-15.62%	11.95%	490
2016	1.8085%	2.5522%	0.4685	3.7361	-7.56%	15.93%	492

Table 2. Descriptive statistics of the accounting data

Panel A: Descriptive statistics of the regressors

Statistics	asset	book	capex	cash	depreciation	dividends	EPS operational	EPS no operational	interest	current liabilities	non-current liabilities	revenue	WC changes
observations	9369	9369	8880	9131	8947	9307	9354	9369	8796	9369	9369	9369	9369
mean	256.85	2977.33	4.18	26.19	3.24	0.86	82.48	-2.38	1.95	9.14	149.43	96.77	3.36
std. dev.	4854.24	2014.04	74.57	718.48	39.49	1.21	1694.38	37.12	28.76	17.68	2705.64	1763.41	8.20
skewness	30.15	72.50	44.88	35.50	39.21	10.95	36.09	5.85	35.53	13.39	30.14	34.83	6.83
kurtosis	966.10	5417.66	2088.47	1314.01	1699.00	309.53	1438.70	1558.84	1375.57	311.41	960.99	1291.42	107.52
Q1	21.62	8.41	0.43	0.72	0.66	0.05	12.70	-2.60	0.19	1.63	5.41	13.26	0.00
Q3	80.86	23.94	2.70	4.25	2.44	1.29	35.90	0.00	1.18	10.81	40.09	46.29	5.32

Panel B: Correlation matrix of regressors

	asset	book	capex	cash	depreciation	dividends	EPS operational	EPS no operational	interest	liabilities current	liabilities non-current	revenue	WC changes
asset	1	0.010	0.805	0.909	0.937	-0.019	0.927	-0.047	0.950	-0.016	0.998	0.972	-0.016
book		1	0.015	0.009	0.018	0.004	0.942	0.000	0.017	-0.003	0.010	0.009	0.002
capex			1	0.776	0.927	-0.012	0.495	0.001	0.896	-0.001	0.800	0.890	-0.015
cash				1	0.814	-0.021	0.966	-0.012	0.825	-0.015	0.900	0.941	-0.011
depreciation					1	-0.012	0.849	-0.057	0.986	-0.002	0.937	0.956	-0.017
dividends						1	-0.019	0.008	-0.012	0.095	-0.016	-0.021	-0.051
EPS_operational							1	-0.030	0.372	-0.012	0.916	0.950	-0.007
EPS_no_op								1	-0.059	0.007	-0.046	-0.032	0.008
interest									1	-0.014	0.953	0.959	-0.020
liabilities_c										1	-0.022	-0.004	0.121
liabilities_nc											1	0.969	-0.020
revenue												1	-0.009
WC_changes													1

Table 3. Implicit rates (1/SDF) of the expected discount factor

year	Rf	all firms	ALL SAMPLES EXCLUDING 1 COMPANY									
			min	company	Q1	company	Q2	company	Q3	company	max	company
1996	5.21%	6.35%	2.49%	INTL PAPER CO	5.76%	GENERAL MILLS INC	6.41%	GILEAD SCIENCES INC	6.92%	ACCENTURE PLC	10.07%	SCHWAB (CHARLES) CORP
1997	5.26%	6.65%	2.08%	NEWELL BRANDS INC	5.74%	BLACKROCK INC	6.50%	CHIPOTLE MEXICAN GRILL INC	7.24%	AMERICAN WATER WORKS CO INC	10.54%	TE CONNECTIVITY LTD
1998	4.86%	6.08%	2.69%	TE CONNECTIVITY LTD	5.38%	MONDELEZ INTERNATIONAL INC	5.85%	O'REILLY AUTOMOTIVE INC	6.26%	SCHEIN (HENRY) INC	8.56%	PENTAIR PLC
1999	4.68%	6.59%	3.31%	GRAINGER (W W) INC	5.88%	BIOGEN INC	6.38%	MERCK & CO	6.92%	XL GROUP LTD	9.42%	BAXTER INTERNATIONAL INC
2000	5.89%	5.91%	2.16%	AMETEK INC	6.24%	AMERICAN WATER WORKS CO INC	6.85%	ROCKWELL COLLINS INC	7.47%	ANTHEM INC	10.78%	CVS HEALTH CORP
2001	3.83%	2.83%	0.97%	WESTROCK CO	2.51%	CHARTER COMMUNICATIONS INC	2.69%	FIRST SOLAR INC	2.90%	ACUITY BRANDS INC	3.42%	EXXON MOBIL CORP
2002	1.65%	2.02%	0.70%	VERIZON COMMUNICATIONS INC	1.74%	ALLIANCE DATA SYSTEMS CORP	1.93%	FORTUNE BRANDS HOME & SECUR	2.07%	VORNADO REALTY TRUST	2.53%	WILLIAMS COS INC
2003	1.02%	1.29%	0.77%	VENTAS INC	1.31%	D R HORTON INC	1.41%	CROWN CASTLE INTL CORP	1.51%	EQT CORP	1.77%	LEGGETT & PLATT INC
2004	1.20%	3.06%	1.17%	L BRANDS INC	2.62%	CONCHO RESOURCES INC	2.88%	LYONDELLBASELL INDUSTRIES NV	3.07%	O'REILLY AUTOMOTIVE INC	3.58%	DOMINION ENERGY INC
2005	2.98%	5.29%	2.48%	PAYPAL HOLDINGS INC	5.02%	HANESBRANDS INC	5.38%	WESTERN UNION CO	5.73%	ASSURANT INC	7.17%	S&P GLOBAL INC
2006	4.80%	5.89%	2.53%	PVH CORP	5.57%	WYNDHAM WORLDWIDE CORP	6.08%	DR PEPPER SNAPPLE GROUP INC	6.55%	RAYTHEON CO	8.72%	CIGNA CORP
2007	4.66%	4.73%	1.97%	DEVON ENERGY CORP	4.48%	GENERAL ELECTRIC CO	4.82%	KROGER CO	5.13%	CITIZENS FINANCIAL GROUP INC	6.10%	NORTHERN TRUST CORP
2008	1.60%	0.09%	0.00%	INTL BUSINESS MACHINES CORP	0.15%	CHEVRON CORP	0.42%	QUEST DIAGNOSTICS INC	0.74%	L3 TECHNOLOGIES INC	1.00%	PROGRESSIVE CORP-OHIO
2009	0.10%	0.15%	0.06%	AMEREN CORP	0.16%	APPLE INC	0.18%	FRONTIER COMMUNICATIONS CORP	0.19%	REGENERON PHARMACEUTICALS	0.61%	EXPRESS SCRIPTS HOLDING CO
2010	0.12%	0.18%	0.07%	UNIVERSAL HEALTH SVCS INC	0.17%	CHARTER COMMUNICATIONS INC	0.18%	CHESAPEAKE ENERGY CORP	0.20%	HALLIBURTON CO	0.46%	3M CO
2011	0.04%	0.63%	0.01%	GOODYEAR TIRE & RUBBER CO	0.11%	HARRIS CORP	0.41%	CELGENE CORP	0.68%	CIMAREX ENERGY CO	1.00%	AT&T INC
2012	0.06%	0.16%	0.08%	HESS CORP	0.17%	QUALCOMM INC	0.18%	MICHAEL KORS HOLDINGS LTD	0.20%	CME GROUP INC	0.63%	PAYPAL HOLDINGS INC
2013	0.02%	0.59%	0.01%	FIRSTENERGY CORP	0.02%	LYONDELLBASELL INDUSTRIES NV	0.07%	GARMIN LTD	0.46%	LOCKHEED MARTIN CORP	0.98%	PRUDENTIAL FINANCIAL INC
2014	0.02%	0.44%	0.01%	TRACTOR SUPPLY CO	0.14%	NAVIENT CORP	0.35%	BB&T CORP	0.67%	ASSURANT INC	1.00%	ECOLAB INC
2015	0.02%	0.16%	0.11%	CVS HEALTH CORP	0.17%	AES CORP	0.18%	WILLIS TOWERS WATSON PLC	0.19%	WAL-MART STORES INC	0.41%	ONEOK INC
2016	0.20%	0.57%	0.19%	BOSTON SCIENTIFIC CORP	0.48%	INTUIT INC	0.53%	MICHAEL KORS HOLDINGS LTD	0.57%	WASTE MANAGEMENT INC	1.00%	TOTAL SYSTEM SERVICES INC

Table 4. Descriptive statistics of expected cash flows

		expected cash flow estimated by Rf						expected cash flow estimated by the whole sample (N firms)						expected cash flow estimated by N - 1 firms					
year	observations	mean	std. dev.	Q1	Q3	min	max	mean	std. dev.	Q1	Q3	min	max	mean	std. dev.	Q1	Q3	min	max
1996	369	7.54	97.74	1.48	3.05	0.06	182.32	8.67	112.46	1.71	3.51	0.07	265.86	9.15	122.51	1.63	3.34	0.07	359.07
1997	381	9.74	135.44	1.72	3.40	0.10	209.60	11.24	156.31	1.99	3.93	0.12	307.96	8.89	113.68	1.80	3.74	0.11	224.56
1998	391	10.33	161.12	1.27	2.64	0.04	192.00	13.77	214.78	1.69	3.53	0.06	255.06	12.69	195.39	1.53	3.48	0.06	370.99
1999	401	9.81	147.63	1.22	3.05	0.09	296.08	12.24	184.27	1.53	3.80	0.11	397.37	11.80	177.33	1.52	3.81	0.10	357.96
2000	414	12.85	208.99	1.55	3.25	0.08	426.00	12.65	205.75	1.53	3.20	0.08	493.93	16.14	269.19	1.68	3.69	0.06	548.70
2001	427	3.88	65.74	0.44	0.89	0.05	136.80	6.09	103.23	0.69	1.40	0.08	236.61	6.09	104.50	0.64	1.33	0.07	216.89
2002	434	2.64	46.02	0.25	0.57	0.02	96.30	4.04	70.48	0.38	0.87	0.02	147.70	4.14	73.64	0.32	0.79	0.02	153.46
2003	436	2.24	38.67	0.24	0.49	0.02	80.80	3.01	51.98	0.33	0.66	0.02	108.15	3.30	57.12	0.36	0.73	0.02	114.60
2004	442	4.67	80.14	0.55	1.08	0.02	168.68	7.45	127.75	0.87	1.72	0.04	269.08	6.34	107.06	0.75	1.66	0.03	225.64
2005	448	9.40	160.52	1.10	2.26	0.01	340.01	12.96	221.29	1.52	3.12	0.02	469.34	12.66	214.31	1.53	3.16	0.01	454.62
2006	456	14.04	246.86	1.51	3.00	0.06	527.52	17.23	302.88	1.85	3.68	0.08	647.64	15.35	260.89	1.89	3.85	0.05	558.14
2007	461	11.74	213.37	0.94	2.13	0.00	458.84	17.12	311.19	1.38	3.10	0.01	669.15	18.05	330.74	1.39	3.10	0.01	711.32
2008	464	0.00	0.00	0.00	0.00	0.00	0.00	0.21	3.92	0.02	0.04	0.01	84.56	1.74	34.24	0.03	0.21	0.01	73.48
2009	467	0.31	5.50	0.03	0.06	0.00	119.04	0.38	6.76	0.03	0.08	0.01	146.29	0.43	7.60	0.04	0.10	0.01	164.45
2010	468	0.06	0.06	0.03	0.08	0.00	0.71	0.09	0.09	0.05	0.11	0.01	1.06	0.10	0.09	0.05	0.12	0.01	0.94
2011	477	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.35	0.17	0.42	0.01	4.06	0.22	0.27	0.03	0.30	0.01	3.02
2012	480	0.07	0.08	0.04	0.08	0.00	0.85	0.10	0.11	0.05	0.11	0.01	1.16	0.12	0.13	0.06	0.13	0.01	1.27
2013	485	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.57	0.24	0.50	0.03	6.81	0.21	0.48	0.01	0.24	0.01	6.37
2014	486	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.38	0.20	0.43	0.03	5.06	0.36	0.48	0.07	0.48	0.01	4.92
2015	490	0.10	0.12	0.05	0.11	0.01	1.53	0.13	0.15	0.06	0.15	0.01	2.02	0.15	0.18	0.07	0.17	0.01	2.56
2016	492	0.32	0.37	0.16	0.37	0.01	5.28	0.51	0.59	0.25	0.58	0.02	8.31	0.46	0.54	0.21	0.52	0.01	7.56

Table 5. Pooled OLS regression results for each accounting variable

regressor	whole sample (N firms)					N - 1 firms				
	parameter (α_k)	std. error	t-value	t-prob	R^2	parameter (α_k)	std. error	t-value	t-prob	R^2
asset	0.02281	0.01675	1361.0	0.000	61.40%	0.02295	0.00002	1334	0.000	63.02%
book	0.54736	0.00703	0.779	0.436	0.00%	0.00001	0.00001	0.780	0.435	0.01%
capex	1.04995	0.00217	483.0	0.000	29.11%	1.06814	0.00224	477.0	0.000	30.55%
cash	0.15228	0.04380	3476.0	0.000	58.44%	0.14883	0.00005	3161.0	0.000	56.61%
depreciation	2.34947	0.00908	259.0	0.000	41.18%	2.42004	0.00948	255.0	0.000	44.31%
dividends	-2.64609	2.75213	-0.961	0.336	0.05%	-2.65419	2.75000	-0.965	0.334	0.05%
EPS operational	0.06927	0.01295	5348.0	0.000	68.89%	0.06864	0.00001	5503.0	0.000	68.59%
EPS no operational	-0.29622	0.31442	-0.942	0.346	0.61%	-0.39037	0.41410	-0.943	0.346	1.07%
interest	3.54445	0.02384	149.0	0.000	48.87%	3.66270	0.02482	148.0	0.000	52.92%
liabilities current	-0.12948	0.14346	-0.903	0.367	0.03%	-0.12987	0.14320	-0.907	0.364	0.03%
liabilities no current	0.04007	0.00009	414.0	0.000	58.89%	0.04043	0.00010	410.0	0.000	60.77%
revenue	0.05831	0.00002	2860.0	0.000	52.96%	0.05887	0.00002	2725.0	0.000	54.74%
WC_changes	-0.22134	0.23421	-0.945	0.345	0.02%	-0.22390	0.23340	-0.959	0.337	0.02%

Note: The model is $\mathrm{E}_t\left(X_{i,t+1}\right)=\alpha_{0,k}+\alpha_k\cdot Z_{k,i,t}+u_{i,t+1}$, where *Z* is the accounting variable *k* for firm *i*.

Table 6. Pooled OLS regression results for each accounting variable on each firm

	Panel A: Pooled OLS estimation results with a single regressor and a constant for each company (sample of N firms)									
	parameter value by company ($\alpha_{i,k}$)					R^2 by company				
regressor	firms signif.	min	Q1	Q2	Q3	max	min	Q1	Q2	Q3	max
asset	246	-0.20762	-0.03310	-0.00828	0.00972	0.64092	0.01%	4.87%	16.35%	32.67%	93.85%
book	241	-0.54841	-0.08564	-0.02112	0.04666	1.15927	0.00%	5.34%	15.74%	33.03%	93.11%
capex	171	-23.57982	-0.23914	0.08014	0.92025	22.02108	0.00%	2.05%	10.80%	30.46%	93.02%
cash	167	-4.69618	-0.30084	-0.11005	0.04885	3.05608	0.00%	3.23%	11.68%	26.50%	93.15%
depreciation	204	-22.25941	-0.80956	-0.18415	0.57893	10.82910	0.00%	5.08%	16.76%	33.51%	93.52%
dividends	216	-38.71694	-1.21243	-0.34235	0.21240	437.88579	0.00%	2.39%	13.64%	30.66%	93.91%
EPS operational	193	-0.39085	-0.02931	-0.00281	0.01966	0.26687	0.00%	2.47%	10.80%	26.11%	93.26%
EPS no operational	69	-2.41048	-0.00539	0.01302	0.05657	15.72389	0.00%	1.17%	4.39%	9.63%	93.38%
interest	156	-41.82815	-1.75401	-0.07219	0.83554	329.33261	0.00%	3.16%	11.07%	29.80%	93.46%
liabilities current	167	-1.93652	-0.09275	0.00000	0.05831	1.76265	0.00%	0.61%	7.37%	23.54%	93.62%
liabilities no current	249	-4.52715	-0.09702	-0.02275	0.00370	11.44937	0.00%	5.08%	17.72%	33.69%	93.74%
revenue	220	-0.76107	-0.03944	-0.00202	0.04243	0.69471	0.00%	3.53%	14.72%	32.84%	93.11%
WC_changes	140	-1.39338	-0.13094	-0.01091	0.01729	1.90501	0.00%	0.36%	4.86%	19.43%	93.01%
	Panel B: Pooled OLS estimation results with a single regressor and a constant for each company (sample of N - 1 firms)									
	parameter value by company ($\alpha_{i,k}$)					R^2 by company				
regressor	firms signif.	min	Q1	Q2	Q3	max	min	Q1	Q2	Q3	max
asset	240	-0.20708	-0.03536	-0.00830	0.00966	0.59179	0.00%	5.10%	16.62%	32.16%	92.57%
book	235	-0.52441	-0.09029	-0.02527	0.04370	1.07040	0.00%	5.29%	15.81%	33.01%	92.89%
capex	168	-28.20663	-0.27395	0.06061	0.83650	20.42064	0.00%	1.79%	10.25%	26.35%	92.68%
cash	168	-4.33619	-0.30554	-0.12482	0.04796	3.05563	0.00%	3.61%	11.39%	26.57%	92.59%
depreciation	204	-24.12114	-0.83756	-0.19441	0.55330	9.52917	0.00%	5.06%	16.01%	33.59%	92.59%
dividends	207	-45.40839	-1.21479	-0.34953	0.19681	274.45146	0.00%	2.65%	13.17%	30.13%	92.79%
EPS operational	183	-0.42377	-0.03113	-0.00391	0.02078	0.26559	0.00%	2.98%	10.93%	25.99%	92.06%

EPS no operational	68	-3.85739	-0.00619	0.01578	0.06287	15.48043	0.00%	0.93%	3.96%	9.51%	92.09%
interest	152	-41.30602	-1.75210	-0.05247	0.88886	309.91552	0.00%	3.64%	10.66%	29.60%	92.76%
liabilities current	161	-1.83425	-0.09453	0.00000	0.05481	2.15862	0.00%	0.50%	7.20%	22.74%	92.62%
liabilities no current	257	-4.76971	-0.09796	-0.02339	0.00465	8.32492	0.00%	5.28%	17.57%	33.08%	92.21%
revenue	222	-0.73288	-0.03861	-0.00231	0.03917	0.67026	0.00%	3.83%	14.80%	30.57%	92.09%
WC_changes	137	-1.64890	-0.12829	-0.01629	0.01441	2.06135	0.00%	0.38%	5.66%	19.89%	92.18%

Note: The model is $E_t\left(X_{i,t+1}\right) = \alpha_{0,i,k} + \alpha_{i,k} \cdot Z_{k,i,t} + u_{i,t+1}$ for each firm, where *Z* is the accounting variable *k* for firm *i*.

Table 7. Pooled OLS regression results for each accounting variable on each firm

Panel A: Including balance sheet items

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	6.7212	2.900	2.32	0.020	6.5507	3.259	2.01	0.044
dummy 2008-2011	-2.9467	0.946	-3.12	0.002	-2.9183	0.959	-3.04	0.002
asset	0.1465	0.029	4.99	0.000	0.1481	0.035	4.19	0.000
capex	0.7199	0.259	2.79	0.005	0.4862	0.279	1.74	0.081
cash	0.0606	0.027	2.21	0.027	0.0177	0.028	0.63	0.531
depreciation	-6.0330	3.047	-1.98	0.048	-6.7661	3.552	-1.90	0.057
EPS operational	0.0622	0.023	2.71	0.007	0.0562	0.027	2.07	0.039
interest	9.2843	3.932	2.36	0.018	10.6909	4.486	2.38	0.017
liabilities no current	-0.1862	0.047	-3.93	0.000	-0.2012	0.058	-3.46	0.001
revenue	-0.1774	0.011	-15.60	0.000	-0.1345	0.014	-9.43	0.000
R^2	86.99%				86.62%			
test residuals AR(1) [N(0,1)]	1.638 [0.101]				1.633 [0.103]			
test residuals AR(2) [N(0,1)]	0.8368 [0.403]				0.9182 [0.358]			

Panel B: Excluding balance sheet items

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.9647	1.756	0.55	0.583	1.0835	1.995	0.54	0.587
dummy 2008-2011	-4.2684	2.498	-1.71	0.088	-4.0976	2.347	-1.75	0.081
asset								
capex	-0.5900	0.081	-7.27	0.000	-0.6185	0.108	-5.73	0.000
cash								
depreciation	-0.4416	1.108	-0.40	0.690	-1.0959	1.486	-0.74	0.461
EPS operational	0.1360	0.002	55.70	0.000	0.1246	0.004	33.60	0.000
interest	5.5224	1.574	3.51	0.000	7.0763	2.057	3.44	0.001
liabilities no current								
revenue	-0.1185	0.002	-49.10	0.000	-0.1164	0.002	-66.80	0.000
R^2	79.64%				80.77%			
test residuals AR(1) [N(0,1)]	1.169 [0.243]				1.256 [0.209]			
test residuals AR(2) [N(0,1)]	0.6956 [0.487]				0.6895 [0.491]			

Panel C: Decomposition revenue and operational expenses

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-0.1909	0.542	-0.35	0.724	-0.5972	0.513	-1.16	0.244
capex	-0.6296	0.021	-29.90	0.000	-0.7187	0.026	-28.10	0.000
expenses operational	-0.1382	0.004	-34.20	0.000	-0.1304	0.005	-28.70	0.000
interest	5.0798	0.559	9.08	0.000	6.0284	0.654	9.21	0.000
revenue	0.0166	0.007	2.23	0.026	0.0053	0.009	0.62	0.538
R^2	79.56%				80.57%			
test residuals AR(1) [N(0,1)]	1.200 [0.230]				1.298 [0.194]			
test residuals AR(2) [N(0,1)]	0.7202 [0.471]				0.7227 [0.470]			

Note: Each estimate is run with jointly significant regressors and the constant in the pooled OLS regression $\mathrm{E}_t\left(X_{i,t+1}\right)=\alpha_0+\sum_{k=1}^{K}\alpha_k\cdot Z_{k,i,t}+\sum_{j=1}^{J}\beta_j\cdot DT_{i,j}+\sum_{s=1}^{S}\gamma_s\cdot DI_{i,s}+u_{i,t+1}$, where the *Z* values are significant accounting items, *DT* is the year dummy, and *DI* is the industry dummy. The estimates show no industry effects and only some years (dummies) are statistically significant, with a similar parameter value (β). So, for the final model, we exclude industry dummies and include a period dummy with a value of one for the years 2008 to 2011 and zero otherwise.

Table 8. Model of explanatory accounting variables of cash flow expectations

Panel A: Model with significant regressors

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.3953	0.400	0.99	0.323	0.0056	0.340	0.02	0.987
capex	-0.9926	0.025	-39.30	0.000	-1.0921	0.034	-32.00	0.000
EPS operational	0.0790	0.000	184.00	0.000	0.0696	0.001	96.30	0.000
interest	1.6774	0.090	18.70	0.000	2.5293	0.132	19.20	0.000
R^2	74.22%				74.85%			
test residuals AR(1) [N(0,1)]	1.015 [0.310]				1.029 [0.304]			
test residuals AR(2) [N(0,1)]	0.8729 [0.383]				0.8415 [0.400]			

Panel B: Model with expected equity cash flow

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.1961	0.742	0.26	0.792	0.6339	0.803	0.79	0.430
expected CFE	0.0710	0.001	70.24	0.000	0.0719	0.001	87.11	0.000
R^2	69.66%				69.48%			
test residuals AR(1) [N(0,1)]	1.001 [0.317]				1.001 [0.317]			
test residuals AR(2) [N(0,1)]	1.006 [0.314]				1.005 [0.315]			

Panel C: Model for equity cash flow

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-14.9127	9.819	-1.52	0.135	-13.8972	8.855	-1.57	0.123
expected CFE	1.1208	0.002	502.13	0.000	1.1207	0.002	521.73	0.000
R^2	79.55%				79.45%			
test residuals AR(1) [N(0,1)]	1.017 [0.309]				N(0,1) = 1.017 [0.309]			
test residuals AR(2) [N(0,1)]	1.001 [0.317]				N(0,1) = 1.001 [0.317]			

Note: The model for Panel A is $\mathrm{E}_t\left(X_{i,t+1}\right)=\alpha_0+\sum_{k=1}^{3}\alpha_k \cdot Z_{k,i,t}+u_{i,t+1}$, where the three accounting regressors are CAPEX, operational EPS, and interest. In Panel B, the regression is $\mathrm{E}_t\left(X_{i,t+1}\right)=\alpha_0+\lambda \cdot ECFE_{i,t}+e_{i,t+1}$, where $ECFE_{i,t}=EPS_{i,t}^{oper}-CAPEX_{i,t}+Interest_{i,t}$. Finally, the model for Panel C is $CFE_{i,t+1}=\alpha_0+\delta \cdot ECFE_{i,t}+\varepsilon_{i,t+1}$, where $CFE_{i,t+1}$ is the equity cash flow.

Table 9. Relation between the accounting and market betas

regressors	whole sample (N firms) parameter	std. error	t-value	t-prob	N - 1 firms parameter	std. error	t-value	t-prob
constant	0.6174	0.022	27.67	0.000	0.6312	0.024	26.30	0.000
Accounting Beta	0.3406	0.051	6.63	0.000	0.3517	0.062	5.65	0.000
R^2	19.73%				19.59%			
test residuals AR(1) [N(0,1)]	0.907 [0.364]				0.911 [0.362]			
test residuals AR(2) [N(0,1)]	1.166 [0.244]				1.253 [0.210]			

Note: First, the market beta is a rolling OLS estimation on the previous 120 monthly excess returns (R^e) and the market risk premium is from Kenneth French's online data library: $R_{i,t}^{e} = \alpha_0 + \beta_{i,t}^{M} \cdot RP_t^{e} + e_{i,t}$. Second, the accounting beta is estimated as $\beta_{i,t}^{A} = \frac{\mathrm{E}_t\left(K_{i,t+1}\right) - Rf_t}{\mathrm{E}_t\left(RP_{t+1}\right)}$. Finally, we run the panel data regression $\beta_{i,t}^{M} = \alpha_0 + \alpha_1 \cdot \beta_{i,t}^{M} + \xi_{i,t}$.

Table 10. Full model for explaining expected cash flows

Panel A: Significant regressors for firms with a null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.3061	0.574	0.53	0.594	-0.2579	0.463	-0.56	0.578
capex	-0.9963	0.022	-45.50	0.000	-1.0964	0.030	-36.20	0.000
EPS operational	0.0791	0.000	173.00	0.000	0.0696	0.001	94.20	0.000
interest	1.6843	0.083	20.20	0.000	2.5390	0.124	20.50	0.000
R^2 without individuals [R^2 with individuals]	84.24% [86.49%]				84.87% [87.06%]			
firms [observations]	346 [6560]				355 [6742]			
test residuals AR(1) [N(0,1)]	1.013 [0.311]				1.026 [0.305]			
test residuals AR(2) [N(0,1)]	0.8868 [0.375]				0.8567 [0.392]			

Panel B: Significant regressors for firms with a non-null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.0155	0.073	0.21	0.832	-0.0151	0.066	-0.23	0.820
dummy period (1996-2000)	2.2310	0.114	19.50	0.000	2.3003	0.118	19.50	0.000
dummy period (2001-2007)	1.4005	0.063	22.40	0.000	1.4309	0.064	22.30	0.000
dummy period (2008-2012)	-0.1986	0.032	-6.20	0.000	-0.1885	0.028	-6.71	0.000
capex	0.0216	0.005	4.30	0.000	0.0154	0.006	2.58	0.010
EPS operational	0.0091	0.001	6.37	0.000	0.0097	0.001	7.96	0.000
EPS no operational	0.0020	0.001	1.97	0.049	0.0025	0.001	2.15	0.032
interest	-0.0407	0.057	-0.71	0.476	-0.0050	0.063	-0.08	0.938
R^2 without individuals [R^2 with individuals]	50.86% [58.04%]				49.05% [56.48%]			
firms [observations]	146 [2810]				137 [2628]			
test residuals AR(1) [N(0,1)]	1.770 [0.077]				1.732 [0.083]			
test residuals AR(2) [N(0,1)]	1.646 [0.100]				1.574 [0.115]			

Panel C: Significant regressors for firms with a null constant in the individual regression and belonging to a sample of N - 1 companies but no to the sample of N firms

regressors	parameter	std. error	t-value	t-prob
constant	0.1301	0.127	1.03	0.305
dummy period (1996-2000)	2.9236	0.651	4.49	0.000
dummy period (2001-2007)	1.5905	0.287	5.54	0.000
dummy period (2008-2012)	-0.2913	0.065	-4.49	0.000
capex	-0.0010	0.006	-0.17	0.868
EPS operational	0.0067	0.002	3.21	0.002
EPS no operational	0.0068	0.003	3.01	0.047
interest	0.2048	0.169	1.21	0.228
R^2 without individuals [R^2 with individuals]	41.26% [48.12%]			
firms [observations]	7 [144]			
test residuals AR(1) [N(0,1)]	1.569 [0.117]			
test residuals AR(2) [N(0,1)]	0.2431 [0.808]			

Note: For all estimations, *constant* shows both the temporary effect of other years of the sample (different from dummies), and the effect of other factors not considered in the model.

Table 11. Test results for the clean surplus relation

Panel A: Clean surplus accounting for firms with a null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-14.6211	15.140	-0.97	0.334	-28.2802	28.090	-1.01	0.314
capex	-1.3485	0.011	-127.00	0.000	-1.5594	0.021	-73.56	0.000
EPS operational	0.1984	0.001	190.00	0.000	0.2377	0.004	57.45	0.000
interest	-1.8796	0.065	-28.90	0.000	-2.0915	0.050	-41.75	0.000
R^2 without individuals [R^2 with individuals]	6.10% [16.52%]				5.24% [15.35%]			
firms [observations]	346 [6560]				355 [6742]			
test residuals AR(1) [N(0,1)]	0.9983 [0.318]				0.9734 [0.331]			
test residuals AR(2) [N(0,1)]	1.002 [0.316]				09982 [0.318]			

Panel B: Clean surplus accounting for firms with a null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
Constant	-12.9490	11.740	-1.10	0.270	-12.8300	11.400	-1.13	0.261
expected cash flow from the SDF	1.3252	0.003	478.00	0.000	1.3522	0.036	37.30	0.000
R^2 without individuals [R^2 with individuals]	4.16% [4.34%]				0.24% [0.25%]			
firms [observations]	346 [6560]				355 [6742]			
test residuals AR(1) [N(0,1)]	0.9993 [0.318]				1.000 [0.317]			
test residuals AR(2) [N(0,1)]	1.002 [0.316]				0.9485 [0.343]			

Panel C: Clean surplus for firms with a null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-8.0091	8.031	-1.00	0.319	-8.4520	8.480	-1.00	0.319
capex	4.5498	4.562	1.00	0.319	4.4351	4.461	0.99	0.320
EPS operational	0.7050	0.733	0.96	0.336	0.7705	0.799	0.96	0.335
interest	1.7695	1.838	0.96	0.336	1.7841	1.844	0.97	0.333
R^2 without individuals [R^2 with individuals]	0.35% [5.39%]				0.36% [5.72%]			
firms [observations]	146 [2810]				137 [2628]			
test residuals AR(1) [N(0,1)]	0.4289 [0.668]				0.4221 [0.673]			
test residuals AR(2) [N(0,1)]	0.4487 [0.654]				0.4400 [0.660]			

Panel D: Clean surplus for firms with a non-null constant in the individual regression

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-5.2328	5.241	-1.00	0.318	-5.2490	5.260	-1.00	0.318
expected cash flow from the SDF	0.4369	0.438	1.00	0.319	0.4323	0.434	1.00	0.319
R^2 without individuals [R^2 with individuals]	0.45% [5.34%]				0.40% [4.92%]			
firms [observations]	146 [2810]				137 [2628]			
test residuals AR(1) [N(0,1)]	1.000 [0.317]				1.000 [0.317]			
test residuals AR(2) [N(0,1)]	0.6800 [0.496]				0.6761 [0.499]			

Note: The clean surplus relation is defined as $B_t = B_{t-1} + d_{,t}$, where *B* is the book value and *d* is dividends. However, since the variable *dividends* is not significant in the model, we substitute it by the significant variables, CAPEX, operational EPS, and interest, or the expected cash flow from the SDF. Additionally, in that expression, the book value is nonstationary; so, we use the following expressions to test the clean surplus relation:

$$B_{i,t} - B_{i,t-1} = \Delta B_{i,t} = \alpha_0 + \alpha_1 \cdot Capex_{i,t} + \alpha_1 \cdot EPS_{i,t}^{operat.} + \alpha_3 \cdot Interest_{i,t} + u_{i,t}$$

$$B_{i,t} - B_{i,t-1} = \Delta B_{i,t} = \beta_0 + \beta_1 \cdot ECF_{i,t}^{SDF.} + e_{i,t}$$

Table 12. Test results for accounting conservatism

Panel A: Accounting conservatism for firms with a null constant in the individual regression on the market return

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	-2.8436	2.429	-1.17	0.242	-2.5802	1.619	-1.59	0.111
return	-0.5992	3.009	-0.20	0.842	0.7879	3.024	0.26	0.794
dummy	3.6194	7.924	0.46	0.648	-2.8484	2.426	-1.17	0.240
return · dummy	2.5734	1.617	1.59	0.112	3.3140	7.989	0.42	0.678
R^2 without individuals [R^2 with individuals]	1.16% [5.22%]				1.15% [5.31%]			
firms [observations]	346 [6560]				355 [6742]			
test residuals AR(1) [N(0,1)]	1.089 [0.276]				1.089 [0.276]			
test residuals AR(2) [N(0,1)]	1.068 [0.286]				1.071 [0.284]			

Panel B: Accounting conservatism for firms with a null constant in the individual regression on the SDF return

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	4.5725	3.534	1.29	0.196	2.0614	7.928	0.26	0.793
return	-1.0316	0.713	-1.45	0.148	-0.7248	0.560	-1.29	0.196
dummy	-4.1905	3.530	-1.19	0.235	-7.3320	8.908	-0.82	0.411
return · dummy	1.0115	0.714	1.42	0.157	1.4891	1.088	1.37	0.171
R^2 without individuals [R^2 with individuals]	0.48% [4.23%]				0.89% [4.76%]			
firms [observations]	346 [6560]				355 [6742]			
test residuals AR(1) [N(0,1)]	0.9569 [0.339]				0.9581 [0.338]			
test residuals AR(2) [N(0,1)]	0.8780 [0.380]				0.8713 [0.384]			

Panel C: Accounting conservatism for firms with a null constant in the individual regression on the market return

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.4950	0.549	0.90	0.367	0.4319	0.321	1.35	0.179
return	-0.0798	0.025	-3.19	0.001	-0.0138	0.007	-2.03	0.043
dummy	0.5300	0.432	1.23	0.220	0.2479	0.192	1.29	0.196
return · dummy	1.6455	0.812	2.03	0.043	0.9899	0.506	1.96	0.050
R^2 without individuals [R^2 with individuals]	1.83% [6.12%]				1.52% [6.02%]			
firms [observations]	146 [2810]				137 [2628]			
test residuals AR(1) [N(0,1)]	1.202 [0.229]				1.019 [0.308]			
test residuals AR(2) [N(0,1)]	0.9483 [0.343]				0.9924 [0.321]			

Panel D: Accounting conservatism for firms with a non-null constant in the individual regression on the SDF return

	whole sample (N firms)				N - 1 firms			
regressors	parameter	std. error	t-value	t-prob	parameter	std. error	t-value	t-prob
constant	0.2139	0.193	1.11	0.267	0.1858	0.328	0.57	0.571
return	-0.0814	0.374	-0.22	0.451	-0.1392	0.152	-0.92	0.359
dummy	0.3796	0.194	1.96	0.050	0.2967	0.149	1.99	0.046
return · dummy	1.8925	0.423	4.48	0.000	1.9232	0.629	3.06	0.002
R^2 without individuals [R^2 with individuals]	0.39% [4.13%]				0.28% [3.96%]			
firms [observations]	146 [2810]				137 [2628]			
test residuals AR(1) [N(0,1)]	1.410 [0.159]				1.169 [0.242]			
test residuals AR(2) [N(0,1)]	0.5611 [0.575]				0.8391 [0.401]			

Note: Following Basu (1997), we use unexpected annual stock returns to proxy for bad news and good news, respectively, and we then estimate the following model, where β_2 indicates conservative accounting (Panels A and C):

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1 \cdot R_{i,t} + \beta_1 \cdot D_{i,t} + \beta_2 \cdot (D_{i,t} \cdot R_{i,t}) + u_{i,t}$$

$$R_{i,t} = \frac{P_{t+3} - P_{t-9}}{P_{t-9}}$$

$$D_{i,t} = \begin{cases} 1 & if\ R_{i,t} < 0 \\ 0 & otherwise \end{cases}$$

However, we use our expected cash flow from the SDF to estimate the expected return and the effect of good and bad news. Therefore, the second model is the following (Panels B and D):

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \alpha_0 + \alpha_1 \cdot R^*_{i,t} + \beta_1 \cdot D^*_{i,t} + \beta_2 \cdot (D^*_{i,t} \cdot R^*_{i,t}) + e_{i,t}$$

$$R^*_{i,t} = E_t(R_{i,t+1}) = \frac{\mathrm{E}_t(Cf_{t+1} | M_{t+1})}{P_{t-1}}$$

$$D^*_{i,t} = \begin{cases} 1 & if\ R^*_{i,t} < \mathrm{E}_t(M_{t+1}) \\ 0 & otherwise \end{cases}$$