Financial Reporting Quality and Optimal Capital Structure

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ABSTRACT

We investigate the role of financial reporting quality in reducing a firm's over- and underleverage problem. Prior research suggests that due to financing frictions arising from adverse selection concerns, firms' observed capital structure deviates from the optimal. Building off a large literature that provides evidence that financial reporting quality can mitigate adverse selection concerns and reduce financing frictions, we find evidence that a firm's deviation from models of optimal capital structure is decreasing in financial reporting quality and that these results are larger in magnitude for the overleverage side.

JEL classification: G32

Keywords: Capital structure; financing frictions; adverse selection; corporate finance; financial reporting

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ABSTRACT

We investigate the role of financial reporting quality in reducing a firm's over- and underleverage problem. Prior research suggests that due to financing frictions arising from adverse selection concerns, firms' observed capital structure deviates from the optimal. Building off a large literature that provides evidence that financial reporting quality can mitigate adverse selection concerns and reduce financing frictions, we find evidence that a firm's deviation from models of optimal capital structure is decreasing in financial reporting quality and that these results are larger in magnitude for the overleverage side.

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1. Introduction

Capital structure is one of the most important firm-level decisions, affecting the firm's risk profile to its expected return to its sensitivity to micro- and macroeconomic business conditions. Under asymmetric information, adverse selection concerns affect a firm's capital structure options (Cooney and Kalay, 1993; Myers, 1984; Myers and Majluf, 1984; Nachmann and Noe, 1994; Noe, 1988) and can result in suboptimal firm-level capital structure. An important role of financial reporting is to reduce the amount of information asymmetry between management and external parties (FASB SFAC No. 1). Consequently, a growing literature shows the quality of financial reporting reduces adverse selection issues, which reduces financing frictions in both the debt and equity markets (Bharath, Pasquariello, and Wu, 2009; Bushman and Williams, 2014; Francis et al., 2005; Lang and Maffett, 2011). Thus, we conjecture that financial reporting may play a role in a firm's capital structure. Specifically, as the quality of financial reporting increases, the financing frictions of the firm are reduced. This reduction in financing frictions may lead to a more efficient or optimal capital structure within the firm.

Prior research also suggests that while financing frictions can affect both debt and equity holders, depending on the parameter values of the models, equity may have a greater adverse selection discount (Cooney and Kalay, 1993; Nachmann and Noe, 1994; Noe, 1988). Thus, we examine how financial reporting quality relates to over- versus underlevered firms. We posit that in our setting the effect could be more pronounced for overlevered firms due to the fact that financial reporting is a public signal and debt holders use not only public but also private signals (Bharath, Sunder, and Sunder, 2008; Zhang, 2008). Thus, as financing frictions in the equity market relatively increase, management may be more likely to overlever the firm.

To test our hypothesized link between financial reporting quality and optimal capital structure we need proxies of both suboptimal capital structure and financial reporting quality. As both of our constructs are inherently difficult to empirically capture, we rely on a couple different measures for each construct. Our first proxy for suboptimal capital structure relies on the recent model and technique developed by van Binsbergen, Graham, and Yang (2010) that estimates the deadweight loss from their model's estimation of suboptimal capital structure. However, we note that due to certain debates within the finance literature over the assumptions and specification of this more sophisticated model, we also use a more established measure of over and underleverage for additional robustness. Specifically, we take a widely cited model of capital structure from the corporate finance literature and take the absolute value of the residual from this predicted capital structure model to estimate suboptimal capital structure within a firm.

To proxy for a firm's financial reporting quality, we use three measures widely used in the literature: two discretionary accrual based measures and an augmented Dechow and Dichev (2002) measure. We estimate the firm's absolute value of discretionary accruals following Jones (1991) as well as the performance-matched version by Kothari, Leone, and Wasley (2005). We estimate the Dechow and Dichev (2002) measure of reporting quality following the augmented model suggested by McNichols (2002).

Consistent with our hypotheses, we find that financial reporting quality is related to the reduction of suboptimal capital structure. Specifically, we find that the magnitude of discretionary accruals and the magnitude of accrual estimation errors are positively correlated with our suboptimal capital structure measures, with the results robust to our variety of measures for both constructs. We also find that our results are significantly larger in magnitude for the firms that are overlevered for all six of our specifications.

To better address the mechanism and causality concerns surrounding the relationship between financial reporting quality and deviations from predicted optimal capital structure, we perform our analyses using Regulation FD (Reg FD) as an exogenous shock to the firm's information environment. By shocking the firm's information environment, we hope to hold simultaneous changes in suboptimal capital structure, as well as any correlated omitted variables such as managerial ability, constant, thereby presenting a better understanding of how financial reporting quality is related to suboptimal capital structure. Our results from this identification strategy confirm our initial hypothesis that financial reporting quality affects suboptimal capital structure through its effect on information asymmetry. Specifically we find that after the implementation of Reg FD, financial reporting quality has a larger effect on suboptimal capital structure, which is consistent with our argument as Reg FD reduced the total amount of information in the market, making other forms of information such as financial reporting quality more valuable in ameliorating information asymmetry issues.

We also perform an additional robustness test using analyst forecast accuracy to examine whether richer information environments moderate the effect financial reporting quality has on optimal capital structure by mitigating adverse selection issues. Consistent with the Reg FD analysis, we find that firms with higher analyst forecast accuracy (i.e. richer information environments) exhibit smaller benefits of financial reporting quality reducing suboptimal capital structure.

Finally, we also examine one other aspect of financial reporting that prior theoretical and empirical evidence has examined in relation to capital structure: conservatism. Prior literature has shown that there is a higher contractual demand for conservatism for highly levered firms due to the benefits debtholders receive from conservative financial reporting (Khan and Watts, 2009). Thus, we replace our financial reporting quality measures with the Khan and Watts (2009) firm-year measure of conservatism, *CSCORE*, and consistent with the prior theoretical literature, we find that conservatism is positively associated with overleverage, but negatively associated with underleverage.

Overall, the results suggest that higher-quality financial reporting can mitigate deviations from predicted models of optimal capital structure and that when financial reporting quality is worse, firms are more likely to experience an overleverage problem as reporting quality is a public signal that affects the equity markets more relative to the debt markets.

Our paper contributes to a number of different research areas. First, our findings relate to a large literature in accounting that examines the effects of financial reporting quality on firm decisions. Specifically, a number of studies have examined the effects of financial reporting quality on investment efficiency (e.g., Badertscher, Shroff and White, 2013; Bushman and Smith, 2001; Healy and Palepu, 2001; Lambert, Leuz, and Verrecchia, 2007; McNichols and Stubben, 2008). Biddle and Hilary (2006) find evidence that firms with higher quality financial reporting are more efficient with respect to investment (i.e. lower investment cash flow sensitivity), and Biddle, Hilary, and Verdi (2009) show that this improvement is both from reducing over- and underinvestment. Although investment and capital structure are closely related areas as the financing decisions of the firm affect the investment decisions of the firm, and vice versa, there is little empirical evidence on how the effects of financial reporting quality affect the optimal funding of investments and the firm. Petacchi (2014) examines the effect of information asymmetry on financing behavior, finding that when there is higher information asymmetry between investors, firms increase their use of debt due to the increased cost of equity. Our paper contributes by being the first to our knowledge to provide a direct link between financial reporting quality and investment *efficiency* by examining the effect financial reporting quality has on the *optimal* funding of these investments through its impact on financing frictions and adverse selection.

Additionally, our paper adds to a significant literature in economics and finance that examines corporate financing decisions and the effect of financing frictions on capital structure. While a great deal of theoretical work has examined what affects the optimal capital structure, the majority of empirical work testing the theoretical predictions has been based on variation in a given capital structure (e.g., Rajan and Zingales, 1995; Frank and Goyal, 2009). Using a more sophisticated model as well as a more conventional model, we seek to provide novel evidence of how financial reporting quality is related to a firm's optimal capital structure decisions versus observed leverage. The robustness of our results to both suboptimal capital structure measures, three proxies for financial reporting quality, as well as different identification strategies provides us with more assurance that our results provide evidence that financial reporting quality can have an effect on optimal capital structure decisions through its effect on information asymmetry.

Finally, we also contribute to the conservatism literature by providing evidence consistent with the prior theoretical and empirical literature. As prior literature suggests that higher levered firms should see a greater contracting demand for conservatism due to benefits such as timely debt covenant violation triggers and monitoring opportunistic diversion of resources (Watts and Zimmerman, 1986; Watts, 1993; Watts, 2003; Ball, 2001), we likewise show that conservatism is associated with suboptimal overleverage situations, but actually can reduce suboptimal underleverage situations, providing a different, but consistent piece of evidence as to how conservatism relates to firm capital structure.

The remainder of the paper is structured as follows. Section 2 provides motivation and hypothesis development. Section 3 reviews our data and research design. Section 4 presents our main empirical results. Section 5 presents our analysis using Regulation FD. Section 6 provides additional analyses. Section 7 concludes.

2. Motivation and hypothesis development

A fundamental question in corporate finance is, "what influences a firms' choice of capital structure?" Moreover, is the firm's observed capital structure optimal or efficient? In frictionless capital markets with no asymmetric information a firm's capital structure is irrelevant for firm value (Modigliani and Miller, 1958). However under asymmetric information, adverse selection concerns affect the capital structure options of a firm (Cooney and Kalay, 1993; Myers, 1984; Myers and Majluf, 1984; Nachmann and Noe, 1994; Noe, 1988). As the degree of information asymmetry increases between management and outsiders, the firm is faced with greater financing frictions. Consequently, prior literature provides evidence that an important determinant of capital structure is information asymmetry (e.g., Bharath et al., 2009; Agarwal and O'Hara, 2007).

Under these conditions management must weigh the cost and benefits of debt when determining the optimal debt level (Johnson, 1998). A result of making these trade-offs may lead a firm to be either over- or underlevered relative to the optimum. Recently, van Binsbergen et al. (2010) find empirical evidence consistent with this conjecture. Specifically they find that financing frictions may lead firms to employ a capital structure that deviates from their model's equilibrium level.

Financial reporting quality could have a mitigating effect on this deviation from suboptimal capital structure in capital markets with frictions due to its effect on information asymmetry. Specifically, prior literature provides evidence that higher-quality financial reporting reduces adverse selection issues (e.g., Leuz and Verrecchia, 2000; Verrecchia, 2001). Chang, Dasgupta, and Hilary (2009) use a model of adverse selection and find evidence that firms with higher-quality financial reporting have more flexibility with respect to capital issuance. Thus, by mitigating adverse selection frictions, financial reporting quality could lead to more optimal capital structures.

In addition, a number of prior studies suggest that higher-quality financial reporting should have a positive impact on investment efficiency (e.g., Bushman and Smith, 2001; Healy and Palepu, 2001; Lambert et al., 2007). Consequently, Biddle and Hilary (2006) and Biddle et al. (2009) find that financial reporting quality affects investment efficiency through the reduction of information asymmetry between managers and outside capital suppliers. However, despite the significant body of literature examining the relationship between financial reporting quality and investment efficiency, there is little analyzing the direct effect of financial reporting quality on capital structure optimality.

Petacchi (2014) examines the relationship between the information asymmetry between investors and financing behavior. Using different specifications, she finds that higher information asymmetry between *investors* increases firm-level leverage, consistent with the view that managers consider the trade-off between debt and equity when facing an increased cost of equity. However, this paper provides the direct link between financial reporting quality and investment efficiency by studying the association between financial reporting quality and *optimal* capital structure. Specifically, we consider the relationship between financial reporting quality and optimal capital structure through its impact the information asymmetry between *managers* and *investors*.

Based upon the prior literature, we also seek to examine how financial reporting quality has a differential impact on over versus underleverage. Specifically, prior research suggests that equity may have a greater adverse selection discount depending on the parameter values of the models (Cooney and Kalay, 1993; Nachmann and Noe, 1994; Noe, 1988). We conjecture that the effect could be more pronounced for overlevered firms in our setting due to the fact that debt holders use not only public signals such as financial reporting, but also private signals (Bharath et al., 2008; Zhang, 2008). Thus, as financing frictions in the equity market relatively increase, management may be more likely to overlever the firm. We predict that financial reporting quality has a larger impact on reducing overleverage inefficiencies due to adverse selection issues being a larger factor in equity markets.[1]

3. Data and research design

3.1. Sample and data

We have two primary samples based on the different measures of suboptimal capital structure. The first sample consists of 45,280 firm-year observations from 1988 to 2008, with the sample period determined by constraints on the van Binsbergen et al. (2010) total deadweight loss from suboptimal capital structure data, cash flow statement data for our financial reporting quality measures, and controls data. The second sample consists of 143,045 observations from 1988 to 2014, with the sample period determined by constraints on the data requirements to

[1] Biddle and Hilary (2006) examine how differential sources of financing affect the relationship between financial reporting quality and investment efficiency. They find evidence that in credit-dominated economies, financial reporting quality has a smaller effect on investment efficiency due to adverse selection issues being a smaller issue in debt markets due to the ability of banks to obtain information through private channels.

calculate the suboptimal capital structure measure from our predicted model, cash flow statement data for our financial reporting quality measures, as well as controls data. For both samples, we exclude firms in the financial services industry.

We obtain the total deadweight loss data from suboptimal capital structure according to the van Binsbergen et al. (2010) model from John Graham, financial reporting data from Compustat, price and share data from CRSP, and analyst data from IBES. For our analyses, we require observations to have the data necessary to compute our suboptimal capital structure measures, lagged financial reporting quality measures, and all control variables. In order to mitigate the influence of outliers, we winsorize continuous control and financial reporting quality variables at the 1% and 99% levels at the sample level.[2]

3.2. Optimal capital structure proxies

3.2.1. van Binsbergen et al. (2010) measure

Our first measure of suboptimal capital structure relies on the van Binsbergen et al. (2010) model. In summary, the authors use exogenous variation in tax benefit functions to empirically estimate firm-specific marginal cost of debt curves conditional on company characteristics such as collateral, size, and book-to-market. These marginal cost functions estimate all ex-ante costs, where the marginal benefit curves capture the tax benefits of debt, and all other benefits are included as negative costs in the estimated marginal cost curves. By integrating the area between the benefit and cost functions, they are able to estimate the net benefits of debt financing and the costs of deviating from the optimum or equilibrium point,

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[2] The Dechow and Dichev (2002) measure of financial reporting quality, *DD*, is winsorized at only the 99% level at the sample level.

which is our *TDWL* measure representing the total deadweight loss from suboptimal capital structure.

The remainder of this section outlines the methodology utilized in van Binsbergen et al. (2010) in more detail. However, it is important to note that the financial reporting quality friction is not included in the van Binsbergen et al. (2010) model, potentially resulting in a model misspecification if financial reporting quality does have an effect on optimal capital structure. This is similar in nature to other papers in the capital structure literature which find that including additional factors in previous models of capital structure can improve our understanding of capital structure decisions (e.g., Graham, Lang, and Shackelford, 2004). By including this factor as an explanatory measure of the total deadweight loss, we posit that financial reporting quality shifts the marginal cost curve, thus reducing the equilibrium deviation found in the van Binsbergen et al. (2010) model (see Figure 1).

The van Binsbergen et al. (2010) method begins by first obtaining a firm's actual debt choice in a given year and assuming for an estimation sample that this point represents the equilibrium intersection of the marginal cost and benefit functions. To rationalize the use of actual debt choice as the equilibrium intersection for this set of firms, the authors focus on firms that are likely to make unconstrained (i.e. optimal) choices, excluding financially distressed and constrained firms based on Z-score and no-debt, respectively, and retaining only firm-year observations where there was a material rebalancing of capital structure. Assuming this estimation sample of firms make (close to) optimal debt choices, the authors use these actual debt choices to back out the cost of debt that would justify the observed debt ratios, thereby obtaining a marginal cost function.

To empirically map out the location of the cost of debt function, the authors use variation in intersection points created by shifts in the marginal benefit function. In order to obtain a firm-year panel of benefit curves, they simulate the tax savings benefit for each dollar of incremental interest deduction using the Graham (2000) method. For each firm-year, the authors calculate the historic mean and variance of the change in taxable income. They use this historical data to create 50 forecasted future incomes years into the future to allow for the full effects of the dynamic features of the tax code (i.e. carryforwards, etc.). They then calculate the present value of the tax liability along each of the 50 income paths, accounting for carrybacks, carryforwards, etc. By adding $10,000 (the smallest increment in Compustat) to current-year income and recalculating the present value tax liability along each path, they are able to calculate the economic marginal tax rate as the difference between the two tax liabilities. They take the average marginal tax rate from the 50 different scenarios to calculate the expected economic marginal tax rate for a given firm-year. The authors repeat these steps for 17 different levels of interest deductions to calculate the entire benefit function for a given firm-year and repeat this process for each firm-year to produce a panel of firm-year tax benefit functions for each year from 1980 to 2008.

To estimate the marginal cost of debt curve, the authors use two identification strategies relying on the exogenous variation in marginal tax benefits. The first strategy simulates the marginal tax benefit function for each firm-year observation, allowing the use of a panel of time-series and cross-sectional benefit variation to identify the cost curve. Controls are included in the specification to hold the cost environment constant as the benefit function varies. The instrument utilized for this method is the area beneath the marginal benefit curve. The second strategy only uses time-series variation in the tax benefit curves due to the 1986 Tax Reform Act, with a phase-in implementation variable used as the instrument for the two-stage least squares method.

The authors regress the intersection points on interest expense and controls to observe how marginal cost curves move with the various controls and interest expense. Using the estimated coefficients from this model on the subsample of non-constrained, non-distressed firms, the authors can compute a cost of debt curve for any firm at any given level of debt (i.e. interest expense). With firm-specific simulated marginal tax benefit curves and estimated marginal cost of debt functions for all companies, the authors can infer the optimal capital structure for any firm at the intersection of the two functions. By integrating the area between the curves, the authors then estimate the net benefits of debt financing and costs of deviating from the optimum which is their measure of suboptimal capital structure, *TDWL*.

We propose that the addition of the financial reporting quality friction can result in shifts to the marginal cost curve, with the direction depending upon whether financial reporting quality is better or worse. Figure 1, Panel B depicts the scenario in which better financial reporting quality results in a rightward shift of the marginal cost curve, which reduces the area between the marginal benefit and cost curves, i.e. the total deadweight loss due to suboptimal capital structure.

3.2.2. Predicted model measure

Our second measure of suboptimal capital structure utilizes a direct model of the expected level of debt motivated by the prior capital structure literature.[3] There is a vast literature in corporate finance exploring the determinants of firm capital structure (e.g., Lemmon,

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[3] This is similar to the investment literature where papers identify excess investment using a model motivated by the finance and economics literatures (e.g., McNichols and Stubben, 2008; Biddle et al., 2009).

Roberts, and Zender, 2008; Frank and Goyal, 2009). We draw on this literature to create a predicted model of total leverage and run our model on a two-digit SIC code industry-year basis. Specifically, the model we utilize is:

$$TDA_{it} = \beta_0 + \beta_1 IOB_{i,t-1} + \beta_2 COL_{i,t-1} + \beta_3 LTA_{i,t-1} + \beta_4 MTB_{i,t-1} + \beta_5 TANG_{i,t-1} + \beta_6 PROFIT_{i,t-1} + \beta_7 INFLATION_{i,t-1} + \beta_8 INDUSTLEV_{i,t-1} \quad (1)$$

where TDA_{it} is the sum of current and long-term debt, divided by total assets; IOB_{it} is the sum of interest expense on short-term and long-term debt, divided by total assets; COL_{it} is the sum of inventory and net property, plant, and equipment, divided by total assets; LTA_{it} is the log of total assets; MTB_{it} is the product of total shares outstanding times stock price, divided by total liabilities less total assets; $TANG_{it}$ is net property, plant, and equipment, divided by total assets; $PROFIT_{it}$ is operating income before depreciation, divided by total assets; $INFLATION_{it}$ is the median forecast for 1-year ahead annual average inflation from the Federal Reserve Bank of Philadelphia; and $INDUSTLEV_{it}$ is the median TDA_{it} for a given two-digit SIC code industry-year.[4] Our predicted measures are drawn primarily from the highly cited Frank and Goyal (2009) model of capital structure.

Based on the assumption that our predicted model provides an adequate measure of what a firm's capital structure should be based on factors shown to have a significant effect on leverage in the prior literature, we use the absolute value of the residual from this predicted model, *ABSRES*, to represent the deviation from the firm's predicted, or optimal, capital structure.

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[4] We winsorize variables at the 99th percentile based upon observed outliers.

3.3. Financial reporting quality proxies

To enhance comparability with prior studies, we use three common measures of financial reporting quality. Our first measure is the absolute value of discretionary accruals using the Jones (1991) model, where accruals are defined as short-term working capital accruals taken from the statement of cash flows following Hribar and Collins (2002). We run the Jones (1991) model cross-sectionally for each two-digit SIC industry-year and take the absolute value of the residual as our measure of financial reporting quality, *DA*. This measure assumes that some accruals are unexplained by firm and industry business conditions and thus serves as a proxy for financial reporting quality.

However, Dechow, Sloan, and Sweeney (1995) and Kothari et al. (2005) note discretionary accruals measures from the Jones (1991) model and its variations are biased towards rejecting the null of no earnings management when sample firms have extreme financial performance. Thus, we utilize a performance-matched measure, *PRFDA*, suggested by Kothari et al. (2005), taking the absolute value of the difference between the Jones (1991) model discretionary accrual of the sample firm and the corresponding average discretionary accrual from a performance- and industry-matched portfolio.

Kothari et al. (2005) note that while the performance-matched discretionary accrual measure based on this model may increase the rate of Type II errors, it more importantly mitigates Type I errors when the partitioning variable of interest is correlated with performance.

To calculate *PRFDA*, within each year and each 2-digit SIC code, we sort the estimation sample into deciles based on current year return-on-assets (ROA), creating ten portfolios.[6] We then match each sample firm observation with the year and industry matched portfolio with the

[6] ROA is defined as net income divided by total assets.

same ROA decile rank in the current year. The performance-matched discretionary accrual is the sample discretionary accrual less the average of the performance-matched portfolio's discretionary accruals.[7]

Our third measure of financial reporting quality is a modified Dechow and Dichev (2002) measure. This measure assumes that earnings contain more information about future cash flows when estimation errors in the accruals process are lower. We follow Francis et al. (2005) and Biddle et al. (2009) and augment the Dechow and Dichev (2002) model by fundamental variables in the Jones (1991) discretionary accrual model as suggested by McNichols (2002):

$$WC_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 ChgSALE_{i,t} + \beta_5 PPEGT_{i,t} \quad (7)$$

where $WC_{i,t}$ is the change in working capital, or specifically, negative one times the sum of change in receivables, the change in inventory, the change in accounts payable and accrued liabilities, the change in taxes payable, and the change in other assets and liabilities; $CFO_{i,t-1}$, $CFO_{i,t}$, and $CFO_{i,t-1}$ are lagged, current, and future operating cash flows as given by the statement of cash flows; $ChgSALE_{i,t}$ is change in revenues; and $PPEGT_{i,t}$ is gross property, plant, and equipment. We scale all variables by average total assets and only keep observations with the necessary data. We also truncate the extreme 1% of observations based on change in working capital and cash flows from operations to eliminate the effect of outliers.

We perform a cross-sectional estimation of the augmented Dechow and Dichev (2002) model by Fama and French (1997) 48 industry code-year, only retaining industries with greater than 9 observations following Francis et al. (2005) and Biddle et al. (2009). These annual cross-

[7] We winsorize discretionary accruals at the 2% and 98% tails prior to calculation of the performance-matched discretionary accruals measure to reduce the influence of outliers.

sectional estimations yield firm- and year-specific residuals. We take the standard deviation of these firm-year residuals from years *t-4* to *t* to calculate our measure of financial reporting quality, *DD*.

3.4. Primary regression specification

Our main regression specifications examine the relation between suboptimal capital structure and financial reporting quality. When we use the *TDWL* measure of optimal capital structure, we control for a variety of factors that may affect the relationship between our primary independent and dependent variables, as well as controlling for variables from van Binsbergen et al. (2010) that may affect the suboptimal capital structure measure.

We perform the following pooled OLS regression:

$$TDWL_{i,t} = \beta_0 + \beta_1 Financial\ Reporting\ Quality\ Proxy_{i,t-1} + \Sigma Controls_{i,t-1} + \Sigma Year\ Fixed\ Effects \quad (8)$$

where $TDWL_{i,t}$ is the total deadweight loss for firm *i* in year *t*; $Financial\ Reporting\ Quality\ Proxy_{i,t-1}$ is either *DA*, *PRFDA*, or *DD* for firm *i* in year *t-1*; $\Sigma Controls_{i,t-1}$ include *LEVERAGE*, *IOB*, *COL*, *LTA*, *MTB*, *TANG*, *PROFIT*, *INFLATION*, and *INDUSTLEV* for firm *i* in year *t-1*. We also include year fixed effects to control for time-specific shocks to optimal capital structure and use two-way standard error clustering by firm and year as suggested by Petersen (2009) to adjust for heteroskedasticity, as well as cross-sectional and serial correlation.

When we use the *ABSRES* measure of optimal capital structure, we do not include any controls as we already account for them in our predicted model. Thus, we perform the following pooled OLS regression:

$$ABSRES_{i,t} = \beta_0 + \beta_1 Financial\ Reporting\ Quality\ Proxy_{i,t-1} + \Sigma Year\ Fixed\ Effects \quad (9)$$

where we also cluster standard errors by firm and year.

To examine the differential impact of financial reporting quality on over- versus underleverage, we split our sample of firms based on the respective model's classification of over- and underlevered firms and regress the suboptimal capital measures for both subsamples using the regression specifications (8) and (9) for the *TDWL* and *ABSRES* subsamples, respectively.

Variables are defined in further detail in Appendix 1.

4. Main empirical results

4.1. Descriptive statistics

Table 1, Panel A presents sample descriptive statistics for the *TDWL* sample. The average (median) total deadweight loss from suboptimal capital structure is approximately 0.02 (0.01). As noted in van Binsbergen et al. (2010), this value can be interpreted economically as the average total deadweight loss being 2% of book value in perpetuity. We also see that consistent with van Binsbergen et al. (2010), the average total deadweight loss from being overlevered is higher than that from being underlevered. The average (median) value for our financial reporting quality proxies range from 0.05 to 0.11 (0.04 to 0.05).

Table 1, Panel B presents sample descriptive statistics for the *ABSRES* sample. The average (median) deviation from our model's predicted capital structure is 0.21 (0.14), which means that the average firm in our sample has a deviation in leverage from the predicted value of 0.21% of total assets. As with the *TDWL* measure, the average deviation in leverage is larger for overlevered than underlevered firms. The average (median) value for our financial reporting quality proxies range from 0.05 to 0.18 (0.04 to 0.06). The samples are fairly similar in terms of control variables, with the exception of *PROFIT*, with the average firm being profitable in the *TDWL* sample and operating at a loss in the *ABSRES* sample.

Table 2 reports the Pearson correlations for the *TDWL* sample, with our other measure of suboptimal capital structure added to this sample. There is a significantly positive correlation between our *TDWL* and *ABSRES* measure at the 1% level, although the magnitude of the coefficient may seem smaller. This is consistent with the debate within the finance literature as to which measure is a better proxy for suboptimal capital structure and why we use both in our analyses to assess the robustness of our results. There is also a significantly positive correlation between all three of our financial reporting quality proxies, providing us with some comfort that our proxies are capturing the same construct.

Of primary interest in this paper, there is a significantly positive correlation between both of our suboptimal capital structure measures and all three financial reporting quality measures at the 1% level. However, to control for a variety of factors that may affect this relationship demonstrated in the univariate analysis, we next turn to our multivariate analysis of the effect of reporting quality on optimal capital structure.

4.2. Overall suboptimal capital structure

Our primary question in this paper is to examine how financial reporting quality relates to optimal capital structure, and more specifically its effect on suboptimal capital structure. Table 3, Panel A presents the results of our analysis of this relationship using the multivariate regression specification outlined in the previous section and the *TDWL* sample. Consistent with our expectations, the coefficients on all three of our financial reporting quality measures are significantly positive. To assess the economic magnitude of the results, we note that a one standard deviation change in *DA*, *PRFDA*, and *DD* increases the total deadweight loss by 0.00001, 0.0002, and 0.0008, which represents 0.1%, 1%, and 4% of the mean of *TDWL*. As *TDWL* represents the total deadweight loss as a percentage of book value in perpetuity, we believe this represents an economically significant result.

Table 3, Panel B presents the results for the *ABSRES* sample. Consistent with the *TDWL* results, we find that the coefficients on all three financial reporting quality measures remain significantly positive. A one standard deviation change in *DA*, *PRFDA*, and *DD* increases the deviation from predicted capital structure by 0.003, 0.008, and 0.153, which represents 1.4%, 3.8%, and 72.9% of the mean of *ABSRES*. As *ABSRES* represents the deviation from predicted leverage as a percentage of total book assets, we once again believe our results are economically significant. The results in Table 3 provide initial evidence that better financial reporting quality reduces the total deadweight loss from suboptimal capital structure overall. We next seek to better understand whether financial reporting quality has a larger effect on ameliorating over- or underleverage.

4.3. Over- versus underleverage

Prior literature examines how financial reporting quality improves capital investment efficiency. While Biddle and Hilary (2006) find that firms with higher quality financial reporting also make more efficient investment decisions, Biddle et al. (2009) show that this improvement in capital investment efficiency is from reducing both over- and underinvestment. In our setting however, the effect of financial reporting quality could differ depending upon how the firm is suboptimally structured.

As adverse selection and financing frictions increase relatively more in the equity market due to poor public signals, management may be more likely to overlever the firm.[8] As financial reporting quality is a public signal, we conjecture that it has a larger effect on mitigating the adverse selection issues of the equity market and thus firms that are overlevered.

The results of our analysis are presented in Tables 4 and 5, Panels A and B. The coefficients across all six panels reveal that our financial reporting quality measures have a significantly positive effect on both losses from overleverage as well as underleverage. However, consistent with our prediction, we find that financial reporting quality has a stronger effect on firms that have deadweight losses from overleverage for both suboptimal capital structure measures and all three financial reporting quality measures. Across the six different specifications, the magnitude of the coefficient for the overleverage sample is approximately four times larger on average than that of the coefficient for the underleverage sample. These results are consistent with evidence that equity markets have a greater adverse selection issue and that financial reporting mitigates the financing frictions in equity markets more due to its use as a public signal.

[8] Bhattacharya et al. (2003) find evidence that accounting opacity is associated with a higher cost of equity across 43 countries.

Overall, the main empirical results provide evidence that as financial reporting quality decreases, the losses created from deviations from the optimal capital structure increases. Specifically, we argue that financial reporting quality's effect on optimal capital structure is through its effect on the information asymmetry between managers and outsiders. As financial reporting quality declines, there is increased information asymmetry between managers and outsiders, which results in greater financing frictions leading to suboptimal capital structure.

However, to acknowledge endogeneity concerns and provide further support for the argument that financial reporting affects optimal capital structure as least in part through its effect on information asymmetry, we attempt to find and use an exogenous shock to a firm's information environment in the next section as an additional specification.

5. Regulation FD

Throughout the analyses thus far, we have assumed that our results stem from the fact that financial reporting quality can have an effect on optimal capital structure through its impact on information asymmetry between managers and investors. However, there could be several different kinds of endogeneity issues. First, it could be that a firm's optimal or suboptimal capital structure affects the type of financial reporting quality the firm intentionally or unintentionally exhibits, resulting in a potential simultaneity or reverse causality issue. It could also be the case that there is a correlated omitted variable problem driving both the increase in financial reporting quality and decrease in suboptimal capital structure. For example, a high-ability manager could manage a firm that exhibits both of these qualities and thus it would not necessarily be the case that financial reporting quality itself is driving changes in suboptimal capital structure.

To address these concerns, we seek to utilize an exogenous shock to the firm's information environment in order to provide evidence that financial reporting quality affects suboptimal capital structure through its effect on information asymmetry. By shocking the firm's information environment, we attempt to hold constant simultaneous changes in suboptimal capital structure, as well as a correlated omitted variable such as managerial ability, helping us to better understand the relationship between financial reporting quality and suboptimal capital structure.

We use Regulation FD (Reg FD) as an exogenous shock to the firm's information environment. The regulation, which was passed by the SEC on October 23, 2000, prohibits firms from disclosing material information to select market participants in the equity market. Consistent with this, prior studies find evidence suggestive that private information conveyed from managers to the equity market was reduced after the implementation of Reg FD (Petacchi, 2014).

We include a *POSTFD* indicator equal to 1 for years after the implementation of Reg FD, and 0 otherwise, as well as an interaction term between *POSTFD* and our financial reporting quality variables. If financial reporting quality has an effect on suboptimal capital structure through its effect on information asymmetry, we expect that financial reporting quality has a larger effect on suboptimal capital structure after Reg FD as the total amount of information in the market decreased after its implementation. Thus, we predict that the coefficient on the interaction term *POSTFD*AQ* will be significantly positive.

Our results are presented in Table 6, Panels A and B for our *TDWL* and *ABSRES* samples, respectively. Out of the six different regression specifications, the interaction term loads significantly positive in four, insignificantly negative in one, and significantly negative in one.

Thus, the results provide further evidence that better financial reporting quality reduces suboptimal capital structure through its reduction of information asymmetry between managers and investors.

6. Additional analyses

6.1. Analyst accuracy

In the previous section we utilized a potential exogenous shock of Regulation FD to address endogeneity concerns and better tease out the mechanism through which adverse selection affects suboptimal capital structure. To provide an additional robustness check, we examine whether richer information environments moderate the effect financial reporting quality has on suboptimal capital structure by mitigating adverse selection issues.

Once again, we propose that if financial reporting quality has an effect on suboptimal capital structure through its effect on information asymmetry and thus financing frictions, the external information environment could serve as a substitute for the firm-generated information set. Specifically, if the external information environment is better, external stakeholders can ameliorate the information asymmetry by utilizing higher quality external information environment sources to maintain a transparent view of the firm and its operations.

To proxy for the information environment of the firm, we use analyst forecast accuracy as our proxy for information intermediation following Lang, Lins, and Miller (2004). Analysts play an important information intermediary role, gathering a diverse set of information in order to assess the firm (Lang et al., 2004) and a variety of existing papers have shown analysts tend to cover firms with a better information environment (e.g., Lang and Lundholm, 1996; Francis, Hanna, and Philbrick, 1997; Bhushnan, 1989; Bushman, Piotroski, and Smith, 2005). In line with this literature, we expect that firms with more accurate earnings forecast accuracy will operate in more informative environments and thus financial reporting quality will matter less for the suboptimal capital structure as there is better external information and hence less information asymmetry between outsiders and insiders.

In Table 7, Panels A and B, we find results consistent with adverse selection issues contributing to financial reporting quality's effect on a firm's suboptimal capital structure. Specifically, when we bifurcate our *TDWL* and *ABSRES* samples into two subsamples based on the median value for analyst forecast accuracy and perform our main regression specification in each subsample, we find that when firms have better forecast accuracy, financial reporting quality affects our measures of suboptimal capital structure less for all six regression specifications. The coefficients on our financial reporting quality measures decrease on average approximately 51% in magnitude for these specifications when moving from the high analyst accuracy subsample to the low analyst accuracy subsample. We perform fully stacked regressions to assess the statistical significance of the difference between our subsamples and find that the difference between the coefficients in the two subsamples based on analyst forecast accuracy are statistically different for four out of our six specifications.

Overall, the results are consistent with our previous results and provide additional evidence that when financial reporting quality is low, there is greater information asymmetry between outsiders and insiders, leading to financing frictions resulting in suboptimal capital structures. When outsiders have access to a richer external information environment however, the effect of financial reporting is mitigated as outsiders can partially relieve the information asymmetry issue by taking advantage of the higher quality external information environment to obtain better transparency into the firm and its operations.

6.2. Conservatism

Thus far we have focused on the relationship between financial reporting quality and suboptimal capital structure. However, there is also theoretical and empirical evidence that capital structure varies with another aspect of financial reporting, namely conservatism (e.g., LaFond and Watts, 2008). Specifically, there is a higher demand for conservative financial reporting for highly levered firms due to the benefits conservative reporting yields for debtholders specifically by providing a verifiable lower bound for debt contracts (Khan and Watts, 2009). These benefits can include constraining shirking opportunities as well as providing triggers for timely debt covenant violations (Watts and Zimmerman, 1986; Watts, 1993; Watts, 2003; Ball, 2001).

Thus, we additionally examine the relationship between conservatism and suboptimal capital structure to assess how another theoretically motivated aspect of financial reporting affects suboptimal capital structure. While it is unclear to us as to how conservatism would affect suboptimal capital structure overall, we predict that conservatism will be positively associated with overleverage and negatively associated with underleverage based on the prior literature.

Our proxy for conservatism is the Khan and Watts (2009) C-score, which provides a firm-year measure of conservatism. Specifically, we estimate annual cross-sectional regressions following the model in Khan and Watts (2009):

$$EARN_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 ANNRET_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 MTB_{i,t} + \beta_5 LEVERAGE_{i,t} \quad (10)$$

$$+ \beta_6 D * ANNRET_{i,t} + \beta_7 D * SIZE_{i,t} + \beta_8 D * MTB_{i,t}$$

$$+ \beta_9 D * LEVERAGE_{i,t} + \beta_{10} ANNRET * SIZE_{i,t}$$

$$+ \beta_{11} ANNRET * MTB_{i,t} + \beta_{12} ANNRET * LEVERAGE_{i,t}$$

$$+ \beta_{13} D * ANNRET * SIZE_{i,t} + \beta_{14} D * ANNRET * MTB_{i,t}$$

$$+ \beta_{15} D * ANNRET * LEVERAGE_{i,t}$$

where $EARN_{i,t}$ is earnings before extraordinary items scaled by the lagged market value of equity; $D_{i,t}$ is an indicator equal to 1 if $ANNRET_{i,t}$ is less than zero and zero otherwise; $ANNRET_{i,t}$ is the cumulative annual return; $SIZE_{i,t}$ is the log of the market value of equity; $MTB_{i,t}$ is the market value of equity divided by the difference between total assets and total liabilities; $LEVERAGE_{i,t}$ is the sum of current and long-term debt scaled by the market value of equity. We only keep observations with the necessary data and firms that have positive total assets, positive book value, and a stock price greater than \$1. We also truncate the variables at the 1% and 99% levels.

Using the estimated coefficients from the Khan and Watts (2009) model, we create our *CSCORE* measure of conservatism:

$$CSCORE_{i,t} = \hat{\beta}_6 + \hat{\beta}_{13} SIZE_{i,t} + \hat{\beta}_{14} MTB_{i,t} + \hat{\beta}_{15} LEVERAGE_{i,t} \quad (11)$$

We perform our main regression specification, replacing our financial reporting quality variable with our conservatism measure and the results are presented for the *TDWL* sample in Table 8. When examining how *CSCORE* relates to *TDWL*, we see that higher conservatism is associated with higher suboptimal capital structure losses overall. However, when breaking up the subsample into firms that are over- and underlevered, we see that higher levels of conservatism are associated with suboptimal capital structure losses from overleverage, but lower suboptimal capital structure losses from underleverage. These results are consistent with the theoretical literature of conservatism outlined below, which also suggests that conservatism is demanded more for highly levered firms due the benefits it yields for these firms specifically.

7. Conclusion

In this paper we investigate whether financial reporting quality relates to one of the most important firm-level issues of optimal capital structure. Our paper contributes to several different research areas.

First, our paper adds to a significant literature in accounting examining the effects of financial reporting quality on investment efficiency and find that financial reporting quality reduces inefficient investment. Although investment and capital structure are closely related areas as the financing decisions of the firm affect the investment decisions of the firm, and vice versa, there is little empirical evidence on how financial reporting quality affects the optimal funding of investments and the firm. We also contribute to recent findings that suggest financial reporting affects financing decisions of the firm. While these prior studies look at the choice between financing between debt and equity, they do not address the question of whether observed choices were optimal capital structure decisions.

In addition, we contribute to a well-established literature in economics and finance examining corporate financing decisions and how financing frictions affect the optimal capital structure of the firm.

The results from our paper provide novel evidence that as financial reporting quality increases a firm's capital structure moves closer to the optimal, with the magnitudes larger on the overleverage side than the underleverage side. Our findings are not only statistically significant but also economically important and are robust to several different measures of suboptimal capital structure and financial reporting quality, as well as an exogenous shock identification strategy designed to better address endogeneity concerns.

Appendix 1 – Variable descriptions

Panel A – Optimal capital structure variables

TDWL	= the deadweight loss from additional costs or lower benefits due to the observed *IOB* being above or below the equilibrium, as calculated in van Binsbergen et al. (2010). See section 2 for further details.
TDWL_OL	= the deadweight loss from additional costs or lower benefits due to the observed *IOB* being above the equilibrium, as calculated in van Binsbergen et al. (2010). See section 2 for further details.
TDWL_UL	= the deadweight loss from additional costs or lower benefits due to the observed *IOB* being below the equilibrium, as calculated in van Binsbergen et al. (2010). See section 2 for further details.
ABSRES	= the absolute value of the residual from the predicted leverage model.
RES_O	= the absolute value of the residual from the predicted leverage model, when the signed residual is positive.
RES_U	= the absolute value of the residual from the predicted leverage model, when the signed residual is negative.

Panel B – Financial reporting quality variables

DA	= the absolute value of lagged discretionary accruals as calculated by the Jones (1991) model.
PRFDA	= the absolute value of lagged performance-matched discretionary accruals as calculated by the Kothari et al. (2005) model.
DD	= the standard deviation of firm residuals from the augmented model of Dechow and Dichev (2002) as suggested by McNichols (2002).
CSCORE	= Khan and Watts (2009) C-score measure of conservatism.

Panel C – Control variables

LEVERAGE	= the sum of current and long-term debt scaled by total assets.
IOB	= interest expense scaled by total assets.
COL	= sum of inventory and net property, plant, and equipment scaled by total assets.
LTA	= log of total assets.
MTB	= the product of total shares outstanding times stock price divided by total liabilities less total assets.
TANG	= net property, plant, and equipment scaled by total assets.
PROFIT	= operating income before depreciation scaled by total assets.
INFLATION	= the median forecast for 1-year ahead annual average inflation from the Federal Reserve Bank of Philadelphia.
INDUSTLEV	= the median book leverage for a given two-digit SIC code industry-year.

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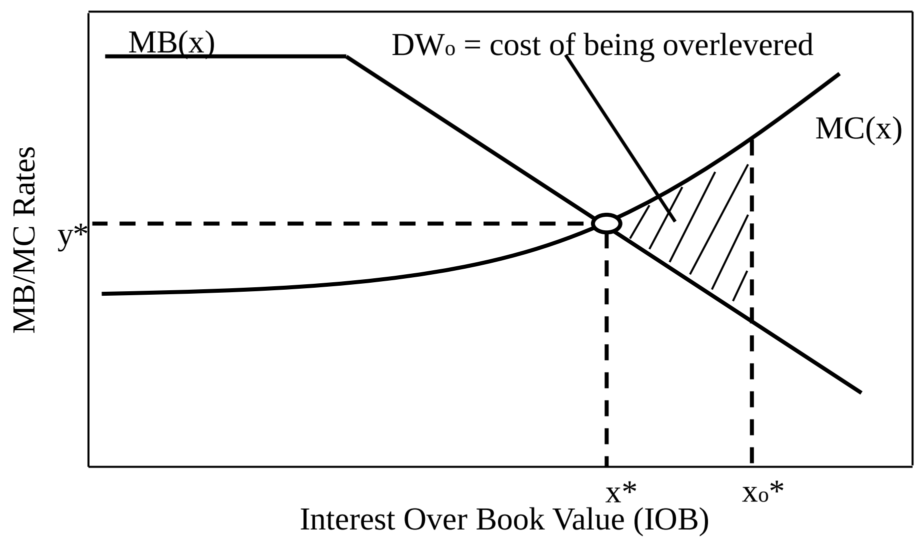
Figure 1 – Shifts in the marginal cost of debt curve due to better financial reporting quality
These figures provide a graphical representation of how better financial reporting quality may affect the van Binsbergen et al. (2010) model specification. The figures show the marginal benefits of debt curve, *MB(x)*, the marginal cost of debt curve, *MC(x)*, and the equilibrium level of debt, *x**, that occurs when the marginal cost equals the marginal benefit. The marginal benefit level at *x** (which equals the marginal cost level at *x**) is denoted by *y**. Panel A depicts the cost of being overlevered, with the shaded area between the *MC* and *MB* curves from the equilibrium, *x**, to the observed debt, x_o, in the case in which the actual level of debt, x_o, exceeds the equilibrium level of debt, *x**. Panel B depicts the cost of being overlevered after adjusting for the shift in the marginal cost curve after accounting for better financial reporting quality.

Panel A – The cost of being overlevered excluding financial reporting quality friction



Panel B – The cost of being overlevered including better financial reporting quality

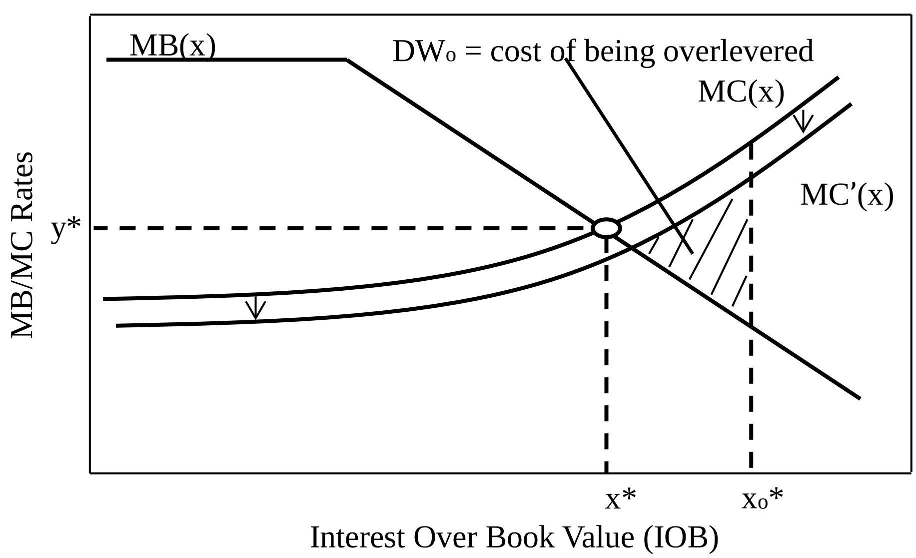


Table 1 – Descriptive statistics

Panel A – TDWL sample

This table reports sample descriptive statistics for the *TDWL* sample. Variables are as defined in Appendix 1.

Variables	Mean	Std Dev	Q1	Median	Q3	N
TDWL	0.02	0.05	0.00	0.01	0.03	45,280
TDWL_OL	0.04	0.06	0.00	0.01	0.04	23,114
TDWL_UL	0.01	0.02	0.00	0.01	0.02	22,166
DA	0.11	0.18	0.02	0.05	0.12	45,280
PRFDA	0.09	0.12	0.02	0.05	0.11	45,280
DD	0.05	0.04	0.02	0.04	0.06	26,318
CSCORE	0.07	0.06	0.03	0.07	0.11	35,027
LEVERAGE	0.22	0.18	0.06	0.20	0.34	45,280
IOB	0.03	0.02	0.01	0.02	0.04	45,280
COL	0.48	0.23	0.31	0.49	0.66	45,280
LTA	5.14	2.20	3.53	4.96	6.61	45,280
MTB	2.63	2.75	1.09	1.81	3.05	45,280
TANG	0.31	0.23	0.13	0.26	0.45	45,280
PROFIT	0.10	0.14	0.06	0.12	0.18	45,280
INFLATION	3.02	0.77	2.39	2.95	3.42	45,280
INDUSTLEV	0.22	0.10	0.13	0.21	0.29	45,280

Table 1 – Descriptive statistics

Panel B – ABSRES sample

This table reports sample descriptive statistics for the *ABSRES* sample. Variables are as defined in Appendix 1.

Variables	Mean	Std Dev	Q1	Median	Q3	N
ABSRES	0.21	0.30	0.07	0.14	0.25	143,045
RES_O	0.27	0.44	0.06	0.14	0.28	57,353
RES_U	0.18	0.16	0.08	0.15	0.24	85,650
DA	0.18	0.34	0.02	0.06	0.16	143,045
PRFDA	0.14	0.21	0.02	0.06	0.15	143,045
DD	0.05	0.05	0.02	0.04	0.07	75,732
CSCORE	0.07	0.06	0.03	0.07	0.11	74,605
LEVERAGE	0.27	0.39	0.02	0.19	0.37	143,045
IOB	0.00	0.01	0.00	0.00	0.00	143,045
COL	0.42	0.27	0.19	0.42	0.63	143,045
LTA	4.85	2.55	3.12	4.78	6.57	143,045
MTB	2.72	6.06	0.94	1.75	3.26	143,045
TANG	0.30	0.26	0.09	0.22	0.46	143,045
PROFIT	-0.07	0.66	-0.03	0.09	0.16	143,045
INFLATION	2.65	0.77	2.19	2.44	3.02	143,045
INDUSTLEV	0.19	0.11	0.10	0.17	0.28	143,045

Table 2 - Correlation matrix

This table reports Pearson correlations for the *TDWL* sample. Variables are as defined in Appendix 1.

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
[1]	*TDWL*	1.00																		
[2]	*TDWL_OL*	1.00	1.00																	
[3]	*TDWL_UL*	1.00	.	1.00																
[4]	*ABSRES*	0.13	0.15	0.14	1.00															
[5]	*RES_O*	0.24	0.23	0.01	1.00	1.00														
[6]	*RES_U*	0.05	0.02	0.14	1.00	.	1.00													
[7]	*DA*	0.04	0.03	0.08	0.11	0.08	0.12	1.00												
[8]	*PRFDA*	0.04	0.03	0.10	0.12	0.10	0.13	0.78	1.00											
[9]	*DD*	0.13	0.11	0.17	0.11	0.02	0.15	0.17	0.22	1.00										
[10]	*CSCORE*	0.22	0.24	0.15	0.13	0.14	0.14	0.06	0.06	0.20	1.00									
[11]	*LEVERAGE*	0.25	0.28	-0.18	-0.03	0.41	-0.32	-0.07	-0.10	-0.15	0.22	1.00								
[12]	*IOB*	0.45	0.50	-0.16	-0.01	0.22	-0.15	-0.07	-0.07	0.04	0.26	0.64	1.00							
[13]	*COL*	0.01	0.04	-0.10	-0.10	-0.15	-0.06	-0.12	-0.18	-0.26	0.05	0.33	0.24	1.00						
[14]	*LTA*	-0.15	-0.15	-0.20	-0.16	0.01	-0.26	-0.10	-0.15	-0.42	-0.56	0.19	-0.06	0.12	1.00					
[15]	*MTB*	0.03	0.02	0.03	0.07	0.14	0.01	0.11	0.13	0.12	-0.32	-0.04	-0.03	-0.21	-0.01	1.00				
[16]	*TANG*	0.02	0.05	-0.10	-0.06	-0.09	-0.04	-0.09	-0.16	-0.32	-0.06	0.30	0.15	0.77	0.20	-0.11	1.00			
[17]	*PROFIT*	-0.14	-0.10	-0.32	-0.17	-0.08	-0.20	-0.08	-0.11	-0.27	-0.24	0.04	-0.02	0.21	0.34	-0.07	0.18	1.00		
[18]	*INFLATION*	-0.01	-0.03	-0.12	-0.08	-0.04	-0.11	-0.15	-0.12	-0.05	-0.06	0.07	0.15	0.11	-0.18	-0.09	0.05	0.05	1.00	
[19]	*INDUSTLEV*	0.03	0.06	-0.13	-0.05	-0.12	-0.01	-0.23	-0.23	-0.23	0.05	0.36	0.25	0.38	0.14	-0.18	0.35	0.14	0.19	1.00

Table 3 – Financial reporting quality and optimal capital structure

Panel A – TDWL sample

The table below reports the results of pooled OLS regressions. The dependent variable *TDWL* is the total deadweight loss from the van Binsbergen et al. (2010) model for that firm-year. The variable of interests *DA, PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. All controls are as defined in Appendix 1. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.0052***	0.0085***	0.0636***
		[0.002]	[0.002]	[0.012]
LEVERAGE		-0.0028	-0.0027	-0.0087**
		[0.004]	[0.004]	[0.004]
IOB		1.1101***	1.1102***	1.1348***
		[0.041]	[0.041]	[0.049]
COL		-0.0275***	-0.0273***	-0.0264***
		[0.002]	[0.003]	[0.004]
LTA		-0.0027***	-0.0026***	-0.0023***
		[0.000]	[0.000]	[0.000]
MTB		0.0003**	0.0003**	0.0003**
		[0.000]	[0.000]	[0.000]
TANG		0.0233***	0.0234***	0.0260***
		[0.003]	[0.003]	[0.004]
PROFIT		-0.0258***	-0.0256***	-0.0239***
		[0.003]	[0.003]	[0.004]
INFLATION		0.0126***	0.0126***	0.0052
		[0.004]	[0.004]	[0.009]
INDUSTLEV		-0.0059	-0.0061	-0.0033
		[0.004]	[0.004]	[0.005]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		45,280	45,280	26,318
R-squared		0.248	0.248	0.248

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 3 – Financial reporting quality and optimal capital structure

Panel B – ABSRES sample

The table below reports the results of pooled OLS regressions. The dependent variable *ABSRES* is the absolute value of the residual from the predicted leverage model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. Controls are not included in this specification as they were used to model the dependent variable. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.1897***	0.3410***	1.4061***
		[0.016]	[0.024]	[0.109]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		143,045	143,045	75,732
R-squared		0.062	0.071	0.072

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 4 – Financial reporting quality and overleverage

Panel A – TDWL sample

The table below reports the results of pooled OLS regressions. The dependent variable *TDWL_OL* is the total deadweight loss from being overlevered from the van Binsbergen et al. (2010) model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. All controls are as defined in Appendix 1. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.0086***	0.0148***	0.1112***
		[0.003]	[0.004]	[0.019]
LEVERAGE		0.0170***	0.0171***	0.0123**
		[0.005]	[0.005]	[0.006]
IOB		1.4270***	1.4277***	1.4903***
		[0.053]	[0.053]	[0.059]
COL		-0.0408***	-0.0405***	-0.0396***
		[0.004]	[0.004]	[0.006]
LTA		-0.0028***	-0.0028***	-0.0022***
		[0.000]	[0.000]	[0.000]
MTB		0.0004**	0.0004**	0.0004*
		[0.000]	[0.000]	[0.000]
TANG		0.0325***	0.0327***	0.0395***
		[0.004]	[0.004]	[0.006]
PROFIT		-0.0275***	-0.0274***	-0.0282***
		[0.005]	[0.005]	[0.006]
INFLATION		0.0133**	0.0133**	0.0037
		[0.006]	[0.006]	[0.016]
INDUSTLEV		-0.0078	-0.0079	-0.0058
		[0.007]	[0.007]	[0.009]
		[0.015]	[0.015]	[0.020]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		23,114	23,114	12,355
R-squared		0.300	0.300	0.311

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 4 – Financial reporting quality and overleverage

Panel B – ABSRES sample

The table below reports the results of pooled OLS regressions. The dependent variable *RES_O* is the absolute value of the residual from the predicted leverage model when the firm is overlevered for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. Controls are not included in this specification as they were used to model the dependent variable. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.3414***	0.6286***	2.6972***
		[0.0304]	[0.0460]	[0.2451]
Estimation		OLS	OLS	OLS
Fixed Effect		Yes	Yes	Yes
Observations		57,353	57,353	30,465
R-squared		0.088	0.106	0.114

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 5 – Financial reporting quality and underleverage

Panel A – TDWL Sample

The table below reports the results of pooled OLS regressions. The dependent variable *TDWL_UL* is the total deadweight loss from being underlevered from the van Binsbergen et al. (2010) model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. All controls are as defined in Appendix 1. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.0029**	0.0036**	0.0259***
		[0.001]	[0.002]	[0.009]
LEVERAGE		-0.0079***	-0.0078***	-0.0061***
		[0.002]	[0.002]	[0.002]
IOB		-0.2070***	-0.2070***	-0.2365***
		[0.025]	[0.025]	[0.031]
COL		0.0085***	0.0086***	0.0076***
		[0.001]	[0.001]	[0.002]
LTA		-0.0012***	-0.0012***	-0.0012***
		[0.000]	[0.000]	[0.000]
MTB		-0.0002***	-0.0002***	-0.0002***
		[0.000]	[0.000]	[0.000]
TANG		-0.0045***	-0.0045***	-0.0037**
		[0.001]	[0.001]	[0.002]
PROFIT		-0.0404***	-0.0403***	-0.0389***
		[0.003]	[0.003]	[0.003]
INFLATION		0.0143**	0.0143**	0.0097
		[0.006]	[0.006]	[0.011]
INDUSTLEV		-0.0025	-0.0029	-0.0034
		[0.002]	[0.002]	[0.002]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		22,166	22,166	13,963
R-squared		0.167	0.167	0.165

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 5 – Financial reporting quality and underleverage

Panel B – ABSRES Sample

The table below reports the results of pooled OLS regressions. The dependent variable *RES_U* is the absolute value of the residual from the predicted leverage model when the firm is underlevered for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. Controls are not included in this specification as they were used to model the dependent variable. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
AQ	+	0.0875***	0.1550***	0.6760***
		[0.007]	[0.012]	[0.061]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		85,650	85,650	45,248
R-squared		0.076	0.083	0.083

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 6 – Regulation FD

Panel A – TDWL Sample

The table below reports the results of pooled OLS regressions. The dependent variable *TDWL* is the total deadweight loss from the van Binsbergen et al. (2010) model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. *POSTFD* is an indicator variable equal to 1 for observations after 2000, and 0 for observations before 2000. All controls are as defined in Appendix 1. Financial reporting quality and controls are lagged by one year. Standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
POSTFD*AQ	+	-0.0079**	-0.0042	0.0394**
		[0.004]	[0.006]	[0.018]
AQ		0.0110***	0.0113***	0.0446***
		[0.003]	[0.004]	[0.013]
POSTFD		0.0058**	0.0054**	0.0026
		[0.002]	[0.002]	[0.003]
LEVERAGE		-0.0024	-0.0023	-0.0107***
		[0.004]	[0.004]	[0.004]
IOB		1.0929***	1.0928***	1.1393***
		[0.042]	[0.043]	[0.049]
COL		-0.0273***	-0.0271***	-0.0265***
		[0.003]	[0.003]	[0.004]
LTA		-0.0025***	-0.0025***	-0.0021***
		[0.000]	[0.000]	[0.000]
MTB		0.0003**	0.0003**	0.0003**
		[0.000]	[0.000]	[0.000]
TANG		0.0233***	0.0234***	0.0265***
		[0.003]	[0.003]	[0.004]
PROFIT		-0.0270***	-0.0269***	-0.0254***
		[0.003]	[0.003]	[0.004]
INFLATION		-0.0036***	-0.0036***	-0.0044*
		[0.001]	[0.001]	[0.002]
INDUSTLEV		-0.0112**	-0.0111**	-0.0084*
		[0.005]	[0.005]	[0.005]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		42,768	42,768	24,337
R-squared		0.244	0.244	0.246

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 6 – Regulation FD

Panel B – ABSRES Sample

The table below reports the results of pooled OLS regressions. The dependent variable *ABSRES* is the absolute value of the residual from the predicted leverage model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. *POSTFD* is an indicator variable equal to 1 for observations after the implementation of Regulation FD in 2000, and 0 for observations before 2000. Controls are not included in this specification as they were used to model the dependent variable. Financial reporting quality and controls are lagged by one year. Standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

		Financial reporting quality proxy		
Variable	Prediction	*DA*	*PRFDA*	*DD*
*POSTFD*AQ*	+	0.0580*	0.1972***	0.8771***
		[0.031]	[0.0403]	[0.1365]
AQ		0.1345***	0.1780***	0.7894***
		[0.025]	[0.0304]	[0.1040]
POSTFD		0.0504***	0.0343***	0.0124**
		[0.006]	[0.0052]	[0.006]
Estimation		OLS	OLS	OLS
Fixed Effect		Year	Year	Year
Observations		136,376	136,376	71,751
R-squared		0.061	0.073	0.076

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.

Table 7 – Analyst accuracy cross-sectional tests

Panel A – TDWL Sample

The table below reports the results of pooled OLS regressions. The dependent variable *TDWL* is the total deadweight loss from the van Binsbergen et al. (2010) model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. Analyst accuracy is as defined in Appendix 1, with the subsamples divided at the median value. Table 3 controls are included in analyses but coefficients are not presented to conserve space. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

	Cross-sectional subsample	
Financial Reporting Quality Proxy	High Analyst_Acc	Low Analyst_Acc
DA	0.0016	0.0085***
	[0.002] †††	[0.002]
PRFDA	0.0007	0.0092***
	[0.003] ††	[0.003]
DD	0.0369**	0.0740***
	[0.016] †	[0.020]

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.
†††, ††, † indicates the significance of the difference in coefficients between the two subsamples at the 0.01, 0.05 and 0.10 level, respectively.

Table 7 – Analyst accuracy cross-sectional tests

Panel B – ABSRES Sample

The table below reports the results of pooled OLS regressions. The dependent variable *ABSRES* is the absolute value of the residual from the predicted leverage model for that firm-year. The variable of interests *DA*, *PRFDA*, and *DD* are the financial reporting quality measures, as defined in Appendix 1. Cross-sectional cut variable is as defined in Appendix 1, with the subsamples divided at the median value. Controls are not included in this specification as they were used to model the dependent variable. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

	Cross-sectional subsample	
Financial Reporting Quality Proxy	High Analyst_Acc	Low Analyst_Acc
DA	0.0336***	0.0386***
	[0.006]	[0.007]
PRFDA	0.0699***	0.0880***
	[0.009]	[0.011]
DD	0.250***	0.4736***
	[0.058] †††	[0.062]

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.
†††, ††, † indicates the significance of the difference in coefficients between the two subsamples at the 0.01, 0.05 and 0.10 level, respectively.

Table 8 – Conservatism and optimal capital structure

The table below reports the results of pooled OLS regressions. The dependent variables *TDWL*, *TDWL_OL*, and *TDWL_UL* are the total deadweight loss, the total deadweight loss from being overlevered, and the total deadweight loss from being under levered, respectively, from the van Binsbergen et al. (2010) model for that firm-year. The variable of interest *CSCORE* is a measure of conservatism, as defined in Appendix 1. All controls are as defined in Appendix 1. Financial reporting quality and controls are lagged by one year. Year fixed effects are included and standard errors are clustered by firm and year. Standard errors are reported below coefficient estimates.

	Deadweight loss proxy		
Dependent Variable	*TDWL*	*TDWL_OL*	*TDWL_UL*
CSCORE	0.0725***	0.0653***	-0.0147*
	[0.017]	[0.021]	[0.008]
LEVERAGE	-0.0152***	0.0064	-0.0047**
	[0.004]	[0.005]	[0.002]
IOB	1.0101***	1.3403***	-0.2498***
	[0.044]	[0.058]	[0.025]
COL	-0.0247***	-0.0397***	0.0104***
	[0.002]	[0.004]	[0.002]
LTA	-0.0012***	-0.0016***	-0.0017***
	[0.000]	[0.001]	[0.000]
MTB	0.0007***	0.0009***	-0.0004***
	[0.000]	[0.000]	[0.000]
TANG	0.0232***	0.0349***	-0.0050***
	[0.002]	[0.004]	[0.001]
PROFIT	-0.0266***	-0.0304***	-0.0403***
	[0.003]	[0.005]	[0.003]
INFLATION	0.0116***	0.0138**	0.0108
	[0.004]	[0.007]	[0.007]
INDUSTLEV	-0.0084**	-0.0129**	-0.0040*
	[0.004]	[0.006]	[0.002]
Estimation	OLS	OLS	OLS
Fixed Effect	Year	Year	Year
Observations	35,027	17,007	18,020
R-squared	0.231	0.295	0.182

***, **, * indicates significance at the 0.01, 0.05 and 0.10 level, respectively.