Accounting, Organizations and Society 52 (2016) 32–49

Contents lists available at ScienceDirect

Accounting, Organizations and Society

journal homepage: www.elsevier.com/locate/aos

The accuracy of disclosures for complex estimates: Evidence from reported stock option fair values☆

Brian Bratten [a], Ross Jennings [b,*], Casey M. Schwab [c]

[a] Gatton College of Business & Economics, University of Kentucky, 423F B&E, Lexington, KY, 40506, USA
[b] McCombs School of Business, University of Texas at Austin, B6400, Austin, TX, 78712, USA
[c] Kelley School of Business, Indiana University, Bloomington, IN, 47405, USA

ARTICLE INFO

Article history:
Received 30 May 2014
Received in revised form
2 July 2015
Accepted 2 September 2015
Available online 20 October 2015

Keywords:
Employee stock options
Fair values
Disclosure quality
Complex estimates

ABSTRACT

In this study, we exploit the unique reporting requirements for employee stock options to provide large sample evidence on the accuracy of footnote disclosures related to a specific complex estimate, the fair value of options granted. We first document the frequency and magnitude of differences between (1) the reported weighted-average fair value of options granted and (2) the calculated option fair value using the disclosed weighted-average valuation model inputs and the Black-Scholes option pricing model. In a sample of 23,358 firm-year observations between 2004 and 2011, we find that 23.9 percent have reported and calculated option fair values that differ by more than ten percent, and that these differences are sticky and are frequently significant as a percentage of net income. We also find that fair value differences are larger for firms that (1) exhibit anomalous stock option footnote disclosures that likely result from disclosure errors, (2) have more complex and hence error-prone stock option programs, and (3) have lower quality financial reporting. Taken together this evidence is consistent with large fair value differences that are primarily due to unintentional errors in the stock option footnote disclosures. To document the consequences of these fair value differences, we provide evidence that errors in the reported fair values prevent financial statement users from using the reported values to reliably estimate future stock option expense for many firms. Consistent with this result, we also find that analyst forecasts are less accurate and more disperse for firms with larger fair value differences.

1. Introduction

As the use of fair values and other complex estimates in financial reporting has increased, regulators, the media, and researchers have expressed concerns about the reporting and auditing of these estimates (SEC, 2003; PCAOB, 2011; Bratten, Gaynor, McDaniel, Montague, & Sierra, 2013; Rapoport, 2013; Griffith, Hammersley, & Kadous, 2015). These estimates are often accompanied by footnote disclosures providing the earliest information to financial statement users about the calculation of the estimates and how the estimates impact net income. Despite the importance of these supporting disclosures, there is virtually no research on their accuracy.

In this study, we conduct a comprehensive examination of footnote disclosures related to a specific complex estimate, the fair value of employee stock options granted. We focus on stock option disclosures to exploit the unique reporting requirements for stock options that, unlike disclosures for other estimates, require disclosure of not only the calculation output—the estimated fair value of employee stock options granted—but also the calculation inputs and the method of calculation. These requirements allow us to evaluate the internal consistency of these disclosures by comparing the disclosed fair value to a calculated fair value based on the firm's disclosed inputs and the Black-Scholes valuation

☆ We gratefully acknowledge helpful comments from Mark Peecher (editor), two anonymous reviewers, Steve Baginiski, John Campbell, Preeti Choudhary, Dain Donelson, Theodore Goodman, Jackie Hammersley, John McInnis, Laura Wang, Teri Yohn, Yong Yu, and workshop participants at Miami University, the University of Toronto, the 2014 FARS midyear meeting, and the 2014 AAA annual meeting. Brian Bratten acknowledges the financial support of the Von Allmen School of Accountancy and the Gatton College of Business and Economics. Ross Jennings acknowledges the financial support of the Deloitte & Touche Professorship of Accounting and the McCombs School of Business. Casey Schwab acknowledges the financial support of the Terry College of Business and the J.M. Tull School of Accounting. We also acknowledge the excellent research assistance of Philip Chung, Anne Ehinger, Ying Huang, Jonathan Ross, and Russell Williamson.

* Corresponding author.
E-mail address: ross.jennings@mccombs.utexas.edu (R. Jennings).

http://dx.doi.org/10.1016/j.aos.2015.09.001
0361-3682/

model. Specifically, we construct a measure that we refer to as the "fair value difference" that equals the absolute value of the difference between the reported and calculated fair values, scaled by the calculated fair value. We use this measure to investigate both the accuracy of these disclosures and the consequences of inaccurate disclosures. Our analyses proceed in three stages.

In the first stage, we document the frequency and materiality of "large" fair value differences (greater than ten percent). We focus on large differences because small differences can occur when multiple grants are issued in the same year and the inputs vary across grants. In our sample of 23,358 firm-year observations between 2004 and 2011, we find that 5573 observations (23.9 percent) have large differences between the reported and calculated fair values. For observations with large differences, 69.5 percent of the differences are greater than one percent of reported income. These results suggest the potential for a significant number of material errors in a high profile financial statement footnote.

In the second stage, we conduct analyses to determine whether unintentional disclosure errors are the primary source of these fair value differences. We first evaluate Compustat footnote data and uncover two anomalies in the stock option disclosure that suggest possible errors. Specifically, we find that 1109 firm-year observations (4.7 percent of the sample) disclose a reported fair value for their options granted equal to the exercise price of the options, a virtual impossibility without a disclosure error. We also find that 1932 firm-year observations (10.8 percent of the 17,959 firm-year observations for which we have disclosure data from the prior year) disclose the same volatility, risk-free-rate, exercise price, or option grant date fair value for option grants in consecutive years, an unlikely occurrence. For both of these anomalies, the fair value difference is larger for observations exhibiting the anomaly, suggesting that disclosure errors are a likely source of at least some of the fair value differences.

To provide further evidence that fair value differences represent disclosure errors, we then conduct a multivariate analysis to determine whether fair value differences are associated with the complexity of the firm's stock option program and with firm reporting and operating environment characteristics that suggest low quality financial reporting. We find that firms have larger fair value differences when they have more complex, and likely more error-prone, stock option programs. Specifically, firms exhibit larger fair value differences when they grant relatively more options to rank-and-file employees, have higher rates of cancellations, have larger changes in their employee base, split their stock during the current year, or make more extensive use of options. We also find that fair value differences are larger when financial reporting quality is lower. Specifically, fair value differences are larger in years in which stock option expense is disclosed rather than expensed and for firms that have an internal control weakness, have an accounting restatement, do not use a Big 4 auditor, or do not have a chief accounting officer as one of its most highly compensated executives. Finally, we find that fair value differences are larger for firms that have less developed accounting systems or operate in a more complex reporting environment. Specifically, firms making a corporate acquisition in the current year, as well as smaller and younger firms, exhibit larger fair value differences.

Although these results suggest that, on average, large fair value differences result from unintentional disclosure errors, we also consider several alternative explanations for the fair value differences that do not involve unintentional disclosure errors. Based on an analysis of hand-collected data for 200 firm-year observations with large fair value differences, we find that 20 large fair value differences are due to data entry errors in the Compustat database. For the remaining 180 observations, we find that at most 30 of the fair value differences are potentially attributable to a combination of (1) use of a valuation model other than the Black-Scholes model, (2) options issued in—or out-of-the-money, (3) discounts for post-vesting restrictions, and (4) disclosure of ranges for valuation model inputs when midpoints are poor proxies for the weighted averages of these inputs. Collectively, these analyses suggest that a substantial majority of large fair value differences are likely attributable to unintentional disclosure errors.

In our third stage, we investigate potential consequences of inaccurate footnote disclosures by examining how these errors map into future share-based compensation expense and impact analysts' earnings forecasts. We find that the relation between expected option expense based on reported fair values and future reported share-based compensation expense is declining in the absolute fair value difference. This result indicates that, on average, reported fair values are measured with increasing error as the absolute fair value difference increases. We also find that the calculated fair value is positively and significantly related to the future expense after controlling for the reported fair value. This result indicates that the calculated fair value is used to compute option expense for many firms and the reported fair value is incorrect. These results suggest that footnote disclosure errors likely impair investors' abilities to predict future option expense. Focusing on analysts' forecasts, we find a positive and significant relation between absolute fair value differences and both absolute forecast errors and forecast dispersion. These results indicate that analysts' forecasts are negatively affected by the stock option footnote errors represented by the absolute fair value differences.

Taken together, the results reported in this paper provide evidence that a substantial number of firms have errors in their stock option footnote. As such, this study makes several contributions for regulators, financial statement users and researchers. First, for regulators, our evidence suggests that material errors occur in stock option footnote disclosures that result in disclosed information that is either not relevant or not faithfully representative. This is especially important given that PCAOB guidance recommends that audit firms conduct the same comparison of reported and calculated fair values that we conduct in this study (PCAOB, 2006, p. 26). Further, these findings validate concerns that "fair value determinations based on unobservable inputs are particularly challenging for auditors" (PCAOB, 2009, p. 5) and that auditors are not adequately evaluating all of the inputs into an estimate for the collective impact on the estimate (PCAOB, 2011; Peecher, Schwartz, & Solomon, 2007; Griffith et al. 2015). The fact that the errors we identify can be detected with little effort leaves open the question of the extent of errors in more difficult-to-verify disclosures of complex estimates.

Second, for financial statements users, our evidence on the accuracy of the stock option footnote disclosure is important because these disclosures provide the earliest information about the magnitude of stock option expense in future years. Indeed, one of the FASB's objectives for employee stock option footnote disclosures is to "enable users of the financial statements to understand… the effect of compensation cost arising from share-based payment arrangements on the income statement" (ASC 718-10-50-1). Substantial differences between the disclosed and calculated fair values that cannot be reconciled based on information provided in the footnote leave financial statement users with no guidance on which value is a more accurate measure of the grant date fair value and, thus, which value to use to estimate future option expense.

Third, this study contributes to prior research. Prior studies examine either material but infrequent errors (i.e., restatements) or general measures of financial reporting quality (e.g., internal control weaknesses, accruals quality). Unlike these studies, we exploit the unique reporting requirements for stock options to provide large sample evidence on the incidence and materiality of errors in