

**DOCTOR OF PHILOSOPHY IN MANAGEMENT**

**ESSAYS ON REVENUE RECOGNITION**

**BY**

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*I dedicate this thesis to my parents, Lalitha and PV Ananthanarayanan, and my advisor Professor Srinivasan Rangan for their endless love, support, and encouragement.*

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*mātr̥dēvō bhava pitr̥dēvō bhava ācāryadēvō bhava*

*Treat thy mother as God, thy father as God, and thy preceptor as God.*

Several individuals play critical roles in our lives. The *Upanishads* talk about three categories of individuals who are equivalent to God because of their impact on us. First, our mother and those who play such a role. Second, our father and fatherly figures, and third, our teachers. The debt we owe these individuals is such that no repayment is sufficient. They, however, do not expect anything in return and act out of their affection and large-heartedness. I have experienced the truth of this statement in this journey and would not be here without them.

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# Abstract

Prior research in accounting and finance has focused largely on *earnings forecasts* and developed models to more accurately forecast earnings. A subset of this research has examined the ability of textual variables computed from corporate annual reports to better forecast earnings. Surprisingly, very little research is available on the important issue of generating improved revenue forecasts. In this thesis, I seek to contribute to the accounting literature on forecasting financial statement items. Specifically, I examine the ability of textual attributes from the MD&A section of 10-Ks to predict future revenues. To do so, I create a novel dataset that consists of only revenue-related sentences from the MD&A section. The textual attributes I examine are the amount of revenue information, revenue tone, forward-looking revenue information, readability of revenue information, over-time consistency in revenue information, and uncertainty in revenue information.

I document that (i) firms that provide more revenue disclosures in the MD&A section have higher future revenues; (ii) consistent with prior research that predicts profits, firms with a higher net tone have higher future revenues; (iii) low revenue growth firms that have optimistic tone have lower future revenues consistent with firms using tone to obfuscate performance; (iv) negative-tone forward-looking sentences are associated with lower future revenues while positive-tone forward-looking sentences do not predict future revenues. I also find that a higher fog index (lower readability) and more consistent revenue disclosures are associated with higher future revenues, and uncertain revenue information is associated with lower future revenues.

In supplemental analyses of the determinants of revenue-related text, I document the following. I find that future repurchases significantly and positively affect revenue tone, suggesting that managers use revenue tone as a complementary signal to support future repurchase activity. In terms of future capital-raising activities, while debt issuance encourages firms to be more optimistic in their revenue tone, equity issuance does not



significantly affect tone. Consistent with acquiring firms trying to influence stock prices via tone, firms that expect to engage in M&A tend to have a more optimistic tone. The results for two common indicators of capital market incentives - loss avoidance and aggressive revenue recognition suggest that tone is not used to obfuscate earnings management. Both variables are negative and significantly related to tone, suggesting that litigation concerns may cause firms to be pessimistic in their revenue disclosures when they have managed earnings upward.

Regarding forward-looking information, I find that firms that forward-looking sentences are negatively related to subsequent equity issuance, suggesting that firms are concerned about future litigation. Consistent with firms attempting to hype their stocks, I find that negative forward-looking sentences are lower before debt issuances and M&A activity. I also find that firms use fewer uncertain revenue sentences when they plan to raise debt in the future to reduce perceived risk and the cost of debt. I find no evidence of tone, forward-looking information, or disclosures about uncertainty being altered in response to product-market considerations.

Several studies based on data on SEC fraud cases and published research show that revenue-based earnings management is the most common mechanism for manipulating earnings (Dechow, Sloan, and Sweeney (1996); Graham, Harvey, and Rajgopal (2005)). While some progress has been made in measuring revenue-based earnings management (Stubben (2010); Giedt (2016)), little is known about the factors that drive it. In particular, the effects of opportunities to manipulate revenues and the business models that generate revenues on revenue manipulation have not received much attention.

In this thesis, I also study textual disclosures in revenue recognition policy footnotes to identify aspects of firms' business models that provide opportunities to manage revenues. Using a bag-of-words approach, I compute five indicators of ex ante discretion over revenue recognition based on the presence of certain keywords in the revenue recognition footnote (RRF) of firm 10-Ks. The indicators relate to price concessions, long-term contracts, the percentage-of-completion method, multi-period contracts, and revenue estimation. I predict that these five indicators will be associated with higher levels of revenue-based earnings management measured using Stubben (2010).

My findings suggest that when firms record revenues and the associated receivables, they understate anticipated price concessions to boost revenues and earnings. I also find that long-term contract firms spread their revenue and receivables growth over multiple periods, causing the per year accrual of revenue to be lower for these firms compared to a firm with a similar level of revenues. Additionally, I find that firms that estimate revenues have lower levels of revenue-based earnings management plausibly because firms anticipate that investors will perceive them negatively and engage in downward revenue management to mitigate the effects of the disclosure.

To provide more insights into how ex ante discretion influences aggressive revenue recognition, I study the impact of the new revenue recognition standard, ASC 606. My results suggest that, on average, the standard did not affect the magnitude of revenue discretion. This finding contrasts with Lee and Lee (2020), who show that the manipulation of working capital accruals increases after ASC 606 was issued. When I examine individual indicators of discretion, I find that discretion over price concessions led to higher levels of revenue management after ASC 606 adoption. In contrast, firms that generate revenues via long-term contracts had lower revenue-based earnings management both in anticipation of and after the issuance of ASC 606. Firms that book revenues over multiple periods and estimate their revenues exhibit no change in revenue-based earnings management in the post-ASC 606 period. Overall, my results suggest that the impact of ASC 606 on revenue manipulation is nuanced and led to heterogeneous changes in manipulation that depend on the nature of revenue contracts and business models.

**Keywords:** Information content, Revenue Recognition, Revenue forecasting, Discretionary Revenues, Earnings Management, Accounting Policy, ASC 606, Textual Analysis

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