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Toward an Understanding of Year-Over-Year Changes in Municipal Management Discussion and Analysis Disclosures

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Abstract

Synopsis

Using a unique setting in which the standard setter (the Governmental Accounting Standards Board) provides guidance on the content of Management Discussion and Analysis (MD&A) disclosures, we investigate the determinants of content changes in municipal government MD&A. We do so in terms of economic changes, turnover, and regulatory characteristics. We use a sample of 1142 municipal MD&A disclosures from fiscal year 2011 to 2015 to calculate a difference score based on the degree to which municipal MD&As change from the previous year. Our empirical analysis highlights that MD&A content changes vary directly with changes in the unemployment rate, fund balance from governmental funds, and auditor turnover. Furthermore, we find evidence that MD&A content changes might be more likely in states without formal GAAP mandates, possibly implying that municipal managers increase transparency by complementing reported financial information with additional qualitative commentary in narrative disclosures when states do not centralize fiscal control over municipalities. Overall, our analysis provides insight on the use of qualitative disclosure by municipal managers, and highlights a need for enhanced commentary on certain items (such as debt and capital expenditures) in order to create greater credibility with and accountability to citizens and other financial statement users. This research is especially timely as GASB re-examines the disclosure mandates of GASB 34.

Keywords

Municipal MD&A, Boilerplate language, Textual similarity, Narrative disclosure

1. Introduction

A unique aspect of financial reporting in the governmental setting is that the Governmental Accounting Standards Board (GASB) provides specific guidance on the format and content of Management Discussion & Analysis (MD&A) disclosures.[1] Specifically, GASB Statement No. 34 (GASB 34) guides the presentation of qualitative information in a government's MD&A within their annual financial report.[2] The rationale of such disclosures is to allow financial managers to present "…both a short- and a long-term analysis of the government's activities" (GASB, 1999, Cod. 2200.106) that helps users[3] assess whether financial position has improved or deteriorated during the year's operations (GASB, 1999, Cod. 2200.109c).[4] Key to these disclosures is commentary on the *reasons* for significant changes from the prior year, rather than simple presentation of amounts or percentage changes. This helps to meet stakeholder demands for information by attaching meaning and context to financial reports (Jordan, Yusuf, Mayer, & Mahar, 2016). The goal of this study is to provide an incremental step toward understanding the qualitative disclosure decisions of municipal governments by modeling the factors associated with year-over-year content modification of municipal MD&A disclosures.

Research suggests that high quality MD&A disclosures improve the value of financial reports for end users of cities (Guo, Fink, & Frank, 2009) and colleges/universities (Fischer, Gordon, & Kraut, 2010). Recently, GASB formally started a project to re-examine GASB 34, with one stated goal being to provide more decision-relevant information to stakeholders (GASB, 2021b). One piece of this project involves enhancing MD&A financial statement analysis, clarifying MD&A disclosure guidance, and conducting a review of MD&A requirements deemed to be boilerplate[5] and "no longer necessary for understanding the financial reporting model" (https://gasb.org/jsp/GASB/GASBContent_C/ProjectPage&cid=1176163289827).[6] Focusing on the relevant content within MD&A should allow for a more readable and meaningful analysis for the various primary governmental financial reporting users as described by GASB's *Concept Statement No. 1* (GASB, 1987), thereby promoting greater government accountability. Beyond the financial reporting model, GASB is interested in improving other financial statement disclosures.[7] While there are studies (e.g., Brown & Knechel, 2016; Brown & Tucker, 2011; Peterson, Schmardebeck, & Wilks, 2015) that examine the determinants of disclosure changes in

the corporate setting, whether results from the corporate sector generalize to the municipal setting is an empirical question.

Extending on the municipal MD&A textual analysis studies of Rich et al., 2016, Rich et al., 2019 by investigating year-over-year textual content changes, we begin by extracting MD&A disclosures directly from the Comprehensive Annual Financial Reports (CAFRs) of a sample of 362 municipalities between 2011 and 2015. We then use a technique grounded in linguistic theory (Brown & Tucker, 2011; Gibbon, Moore, & Winski, 1997; Nelson & Pritchard, 2016) to calculate a "difference score" capturing the extent to which a government's MD&A section (excluding numbers) deviates from that of the prior year. Examination of the data over time suggests that municipal managers do modify the content in MD&A disclosures, and that the rate of content change is relatively constant during our sample period. One interpretation of this evidence is that GASB 34's guidance for managers to share their informed insights encourages municipal financial managers to provide changing narratives within MD&A disclosures.

Next, informed by GASB 34, we create a model to test how economic changes, turnover (i.e., top financial manager or auditor changes), and regulatory factors relate to changes in MD&A content. Our findings suggest larger changes in the unemployment rate and fund balance of governmental funds are associated with greater difference scores, implying that municipal managers modify MD&A commentary in response to "big-picture" external and internal economic changes (Brown & Tucker, 2011; Lang & Stice-Lawrence, 2015).[8] However, we find no association between our difference score and the change in capital asset expenditures nor the change in net debt (proceeds minus retirements). We interpret these latter findings to suggest that "account-specific" changes, specifically relating to new and existing capital projects, could benefit from additional MD&A commentary and receive further attention during the GASB reporting re-examination project.

In addition, we find that auditor changes are associated with higher difference scores, indicating that new auditors may request changes in narrative disclosure (Brown & Knechel, 2016). Moreover, we find that municipalities in states with no official Generally Accepted Accounting Principles (GAAP) mandate (Baber & Gore, 2008; Kim, McDonald, & Lee, 2016) are associated with higher difference scores overall, and relate to larger content changes in the presence of changes in both net position of governmental activities and fund balance of governmental funds as compared to municipalities in GAAP-mandated states. We interpret these findings as evidence that municipal managers voluntarily supplement reported financial information with additional qualitative commentary in MD&A disclosures in an effort to increase transparency and close the information gap with stakeholders when states do not impose centralized fiscal control over municipalities (Baber & Gore, 2008).

Our study contributes to the disclosure literature as we specifically examine changes in the content of broad qualitative disclosures for a sizable sample of U.S. municipalities. While many papers examine the similarity of narrative disclosures in the corporate sector, we know relatively little about narrative disclosures in an environment where guidance is provided directly by the standard setter without the enforcement authority of a body such as the SEC (e.g., Bloch, 2016; Jordan et al., 2016; Rich et al., 2019; Rich & Zhang, 2016). This should be of interest to both the FASB and IASB amidst pressure for increased involvement in non-financial disclosures (Barker & Eccles, 2018).

Additionally, our study informs CAFR users and governmental standards setters on municipal conditions that are more likely to result in disclosure alteration in the MD&A. As a result, our research supports GASB's current projects to re-examine the information required in the MD&A section under Statement No. 34 and develop a disclosure framework for financial statement notes (Governmental Accounting Standards Board (GASB), 2021a, Governmental Accounting Standards Board (GASB), 2021b). Our analyses also provide details on conditions where municipal financial managers complement reported financials with additional qualitative

content, as well as where enhanced commentary could be warranted. This is especially important because the yearly CAFR is a primary source of information about performance in the municipal sector, which lacks the frequent reporting timeline of publicly-traded companies (through mechanisms such as 10-Q disclosures).

The paper proceeds as follows. First, we present a background on disclosure requirements under GASB 34 and the governmental MD&A literature, followed by a discussion of textual similarity literature in the corporate setting. We then outline three hypotheses developed based on prior research. Our sample selection procedures, similarity score calculation, and methodology are presented next, followed by a discussion of the results. The last section provides concluding remarks.

2. Literature review and hypothesis development

2.1. GASB statement No. 34 and governmental MD&A research

Unlike corporate entities, government entities have citizen well-being as a primary purpose, acquire revenues through involuntary tax sources, and have strict budgetary requirements (GASB, 2006). These governmental characteristics suggest a stewardship role over public resources (GASB, 2006) and the need for reporting geared toward accountability, rather than strictly for profitability. In fact, GASB *Concept Statement No. 1* states that "Governmental financial reporting should provide information to assist users in (a) assessing accountability and (b) making economic, social, and political decisions" (GASB, 1987, Paragraph 76). Once implemented in 1999, GASB 34 established new financial reporting requirements for both state and local governments designed to improve the effectiveness of financial reporting (GASB, 1999, Cod. 2200.101). One requirement of the updated reporting model was mandating the inclusion of an MD&A section within the CAFR. This additional section is designed to give readers an objective and easily readable analysis of the government's financial performance for the year (GASB, 1999, Cod. 2200.109c).[9] Governmental finance managers indicate that they perceive the MD&A requirement under GASB 34 to assist stakeholder understanding of financial conditions by better disclosing information and explanations (Lu, 2007). In addition to GASB 34 guidance, some municipalities may follow a basic MD&A format that is provided by their auditor and/or their respective state's Comptroller's Office.[10]

Providing concise, readable, and timely content within the MD&A is critical for meeting users' informational needs (Yusuf & Jordan, 2017).[11] For example, municipal analysts find well-written MD&As are insightful in assessing management's quality and the government's financial condition (Bloch, 2016), while citizens want a variety of disclosures provided in a manner with "context and relevant to issues that citizens care about" (Jordan et al., 2016). To enhance the understanding of the MD&A for governments' varied stakeholders, GASB 34's MD&A requirements "encourage financial managers to effectively report only the most relevant information and avoid boilerplate language" (GASB, 1999, Cod. 2200.109). This "boilerplate" language represents generalized communication that lacks specific information content, and likely does not change significantly year-over-year. To avoid simply repeating financial amounts and changes, GASB 34 recommends including discussion of reasons for significant changes and important economic factors (GASB, 1999, Cod. 2200.109c). Providing descriptions of the financial condition and significant trends in major funds and activities offer relevance to users and help them to assess the government's ongoing financial health (Reck, Lowensohn, & Wilson, 2013, pg. 364).[12]

Guo et al. (2009) show a variation in MD&A disclosure quality and find that many cities follow a basic MD&A format without providing additional disclosure information beyond the minimum reporting requirements of GASB 34 (such as long-term trends). Conversely, municipalities with higher MD&A disclosure quality tend to provide better descriptive details pertaining to financial and socioeconomic conditions and make municipal comparisons at the regional, state, and federal levels.[13] Governmental research has also noted differences in readability among entities (Marsh, Montondon, & Kemp, 2005) and indicated that higher MD&A readability can

lead to greater user understanding (Stalebrink, 2019; Yusuf & Jordan, 2017). However, Bloch's (2016) survey finds that municipal bond analysts deem a significant number of MD&As as “too general”, which reduces the effectiveness and benefits of GASB 34's financial reporting model. These research findings on MD&As suggest a pertinence to GASB's reexamination project regarding GASB 34 and its MD&A section. Thus, MD&As can be further improved in meeting the informational needs of governmental stakeholders if new guidance helps encourage government finance officers to use their discretion to explain the relevant financial and structural changes occurring each fiscal year.

2.2. Similarity score and corporate sector research

Textual content that is repetitive year-over-year may lose information value to users. Non-changing (or “boilerplate”) content can be reduced by altering a financial report's textual information in a manner that reflects changing economic and transactional circumstances. One way to detect the use of non-changing language within disclosures is to determine a document's similarity compared to its prior year's version. Within the corporate literature, Brown and Tucker (2011) suggest that corporate MD&As may be uninformative if they fail to change significantly in response to the firm's meaningful economic changes. They find evidence suggesting that companies with large economic changes (e.g., absolute value of the change in diluted earnings per share, current debt due, free cash flows) have more MD&A modification in the subsequent year than those with smaller economic changes. Additional corporate research follows the findings of Brown and Tucker (2011) with greater accounting disclosure changes occurring with greater changes in the absolute value of assets or book-to-market ratio (Peterson et al., 2015), changes in research and development expenditures (Cazier & Pfeiffer, 2016), and net income and losses (Lang & Stice-Lawrence, 2015). Significant cash flows from changes in debt or equity are found to also be related to changes in textual disclosure (Peterson et al., 2015). Thus, corporate research suggests entities adjust their textual disclosures to reflect transactions and changes to accounting balances.

Outside of economic changes, turnover of financial reporting participants can influence textual disclosures. Corporate executives are deeply involved in financial reporting. Positive associations are found between CEO turnover and MD&A modifications (Li, 2017), as well as negative associations being noted between CFO changes and accounting policy disclosure consistency (Peterson et al., 2015). Since publicly-traded companies are required to provide audited annual financial statements, auditors (representing another party involved in the reporting process) can also affect textual content changes. Peterson et al. (2015) and Johnston and Zhang (2021) show that auditor changes are related to greater changes in accounting disclosures and financial reporting dissimilarity, respectively. While McMullin (2016) notes that auditor changes shape future footnote disclosures, Brown and Knechel (2016) find that business description and MD&A disclosure similarity scores are lowest with a new auditor. Moreover, the findings of Myers, Myers, and Omer (2003) show that auditors with longer tenure act to constrain aggressive management and reporting decisions, perhaps leading to similar narrative disclosures over time.

As well, corporate research has found relationships between textual disclosure changes and complexity. Peterson et al. (2015) notes greater financial reporting textual alteration with the presence of a merger and with a greater number of business segments. Beyond firm complexity, the regulatory or reporting environment may affect textual choices in disclosures. Nelson and Pritchard's (2016) findings indicate that high litigation risk is associated with more changes in voluntary cautionary language within annual filings, while Lang and Stice-Lawrence's (2015) findings note greater comparability and information content for non-U.S. companies reporting under IFRS compared to non-U.S. companies using their local country's accounting standards. In summary, corporate textual similarity research indicates that significant economic changes, auditor/executive turnover, and reporting complexity are associated with greater narrative disclosure modification.

2.3. Hypotheses

Extending results found in the corporate textual reporting literature, we analyze the determinants of textual reporting changes in a governmental context within municipal MD&As. Specifically, we build three hypotheses that examine how (1) economic changes, (2) auditor or top financial manager turnover, and (3) regulatory characteristics impact municipalities' year-over-year textual content changes.

First, prior literature (Sargent, 2009) examines how changes in the macroeconomic environment and governmental economic policies may influence governmental financial decisions and behaviors. Many such changes may be reflected in the language and textual choices within disclosures. Although research on municipal qualitative disclosure patterns is limited, GASB 34 explicitly states that municipal MD&A disclosures are to provide users with a "fact-based analysis" that includes specific reasons for changes in financial position compared to the prior year and specific sections devoted to significant capital asset and long-term debt activity (GASB, 1999, Cod. 2200.109f). The candid discussion of an entity's economic changes found within the MD&A should provide context and understanding for intended users (e.g., citizens, creditors, other levels of government).

Similar to Brown and Tucker (2011), we consider the effect of internal and external economic change variables on MD&A modification at the municipality-level. Corporate literature supports the notion that financial transactions and year-to-year accounting balance increases or decreases influence narrative disclosures (e.g., Brown & Tucker, 2011; Peterson et al., 2015) and reduce the proportion of boilerplate language (Lang & Stice-Lawrence, 2015). However, non-changing text may be associated with static information. Entities may "simply repeat content and sentence structures in the MD&A and footnotes from one year to the next if there is no new material information to be presented to investors beyond the change in numbers" (Amel-Zadeh & Faasse, 2016). Even though GASB 34 recommends discussion of significant changes and important economic factors (GASB, 1999, Cod. 2200.109c), there is the possibility that municipal managers perceive little value in providing incremental details on performance given that stakeholders often perceive governmental financial reports as unfamiliar and complex (Mead, 2002). In addition, if the financial reports are not released in a timely manner for decision usefulness, managers may not have the incentive to make content changes. However, municipalities may fulfill their stewardship and accountability roles by providing the details in the MD&A. "[A]ccountability requires governments to answer to the citizenry—to justify the raising of public resources and the purposes for which they are used. Governmental accountability is based on the belief that the citizenry has a right to know (GASB, 1987, Paragraph 56)." Therefore, we state our first hypothesis in null form:

H1 Municipal MD&A disclosure modification is not associated with economic changes.

Second, we examine the impact of turnover in the individual agents that are heavily involved in financial reporting. Following corporate research, we focus on changes in both the top municipal financial manager position, as well as financial statement auditors. Li (2010) suggests that corporate management turnover could influence disclosure changes. Following this proposition, subsequent research notes associations between executive changes and written disclosure modifications (Li, 2017; Peterson et al., 2015).

In the governmental setting, financial managers generally bear responsibility for the production of the material disclosed in the MD&A (Smith, Kupierz, & Schiffel, 2014). While there is limited evidence on the links between a municipal financial manager change and disclosure practices, Rich and Zhang (2016) do find evidence of links between accounting restatements and turnover in the top financial manager position. Such turnover may also affect the level of transparency (Alt, Lassen, & Rose, 2006). These findings suggest that new management could have a distinct narrative disclosure style.

Prior literature within the corporate context also indicates that auditor changes have an impact on disclosure. This research has demonstrated greater reporting disclosure changes following an auditor change (e.g., Brown & Knechel, 2016; Peterson et al., 2015) that often reflects the "style" of the new audit firm (Johnston & Zhang, 2021). These findings suggest that new auditors could impact the MD&A. Furthermore, auditor tenure is suggested to promote reporting consistency (Myers et al., 2003), and perhaps also results in disclosure similarity.

Auditors review governmental MD&A (as part of the required supplementary information (RSI)), but do not render an opinion on it (Wilson & Kattelus, 2001). Thus, a government's auditors conduct limited procedures associated with the content within the MD&A (GASB, 2009). As new auditors may request more client voluntary disclosure changes than tenured auditors, we expect greater MD&A modifications to occur after auditor turnover. Due to style preferences (Johnston & Zhang, 2021), new auditors may request MD&A information be rewritten for clarity, accuracy, or consistency with the rest of the financial report. Since both types of turnover (top financial manager and auditor) are deemed to influence a municipality's linguistic reporting, we hypothesize that:

H2 Municipalities with top financial manager or auditor turnover will modify their MD&A disclosures more than those municipalities without such turnover.

Third, regulatory characteristics are another aspect found to be related to textual disclosure changes. In the corporate literature, the presence of higher risk and non-IFRS accounting (i.e., local-country accounting standards) are shown to be associated with disclosure content differences (Lang & Stice-Lawrence, 2015; Nelson & Pritchard, 2016). These findings point to management's need to explain abnormal risk or non-standardized accounting practices.

Within the governmental setting, Kim et al. (2016) highlight that while GASB has formulated a government-centered GAAP, the regulatory authority to formally mandate its use by local governments is in the hands of the state government. Gore (2004) suggests that disclosure levels are higher in GAAP states compared to non-GAAP states, and also that incentives to voluntarily disclose are often driven by nonregulatory forces (such as debt markets). Furthermore, Baber and Gore (2008) posit that GAAP requirements could reflect state-level governance via centralized fiscal control over municipalities where the "... differences between GAAP and non-GAAP states can indicate the consequences of comprehensive state policies that include mandated GAAP, rather than the direct effects of the GAAP requirement itself" (pg. 572). One possibility is that municipal financial managers use additional qualitative MD&A commentary to complement financial information in the absence of comprehensive state policies, to increase transparency and to close the information gap with stakeholders. If true, then we predict that municipalities in states without formal GAAP requirements will have higher levels of MD&A content modification than those in GAAP-required states:

H3 Municipalities in states without formal GAAP requirements will be associated with greater MD&A content modification.

3. Research design

3.1. Sample and descriptive statistics

We extend Rich et al. (2016) by analyzing the determinants of year-over-year MD&A changes, and conduct our analysis based on the 362 municipalities examined in that study.[14] Following the process from Rich et al. (2016), we obtained CAFRs from municipality websites from 2011 to 2015, and extracted the MD&A section for textual analysis. Our sample starts with the municipalities that responded to the 2011 International City/County Management Association (ICMA) Municipal Form of Government Survey and are subject to the Single Audit Act

(OMB, 2003).[15] Given that we are interested in *changes* in municipal MD&A content, our focus is on the 4-year window from 2012 to 2015.[16] After deleting municipalities with missing or incomplete MD&A or other control variable data, the final sample consists of 1142 municipality-year observations from 321 unique municipalities. Table 1 outlines our sample selection procedures.

Table 1. Sample selection.

	# cities	# obs
Cities and towns from Rich et al. (2016)	362	1448
Less those with missing Federal Audit Clearinghouse details	(1)	(74)
Less those with missing / incomplete MD&A details from CAFRs	(1)	(56)
Less those with missing finance director details	(39)	(163)
Less those with missing other control variable details		(13)
Final sample	321	1142

Data on the form of government is from the 2011 ICMA survey, while details on city-level, calendar-year unemployment rates are from the Local Area Unemployment Statistics provided by the Bureau of Labor Statistics (BLS). County-level personal income figures are from the Bureau of Economic Analysis (BEA). Auditor details and municipality zip codes are from the Federal Audit Clearinghouse's Single Audit Database, while population is obtained from the U.S. Census Bureau. Recipients of the Government Finance Officers Association's (GFOA's) Certificate of Excellence in Financial Reporting come directly from the GFOA. Lastly, we manually collect financial and demographic details as well as the names of finance directors directly from CAFRs.

Research suggests word usage is highly skewed (Nelson & Pritchard, 2016). For instance, "zebra" occurs far less frequently than "the" in most documents. The distribution becomes more skewed when we examine two-word pairings, and even more so with three-word pairings (known as "trigrams"). For example, Gibbon et al. (1997) examines 38 million-word combinations and finds that 77% of trigrams occurred only once. In order to gauge the extent that the verbiage used in municipal MD&A wording is consistent across all municipalities, within-state, and between years, we convert each document into text (excluding numbers), break the text into its component trigrams, and calculate the percentage of trigram matches.[17] For example, suppose S(A) contains the set of trigrams in a reference document, and S(B) contains the set of trigrams in a comparison document. The resemblance, R, is calculated as:

$$R = \frac{|S(A) \cap S(B)|}{|S(A) \cup S(B)|}$$

Thus, comparing a document to itself would generate a score of 1, and two documents lacking any trigram overlap would have a score of 0 (hence, R is bounded by 0 and 1).[18]

Given that we are interested in measuring the extent to which MD&A disclosures differ over time, we use Python to calculate a year-over year difference score (*Rawscore*) as 1 – R from above. By construction, high values for *Rawscore* indicate larger differences between MD&A disclosures, while the reverse is true for low values. Fig. 1 plots yearly values for *Rawscore* for the municipal MD&As in our sample over the 2012–2015 time period. "All Pairs" represents the mean difference score between all combinations of all MD&A disclosures, and addresses the structural similarities that exist among all MD&A disclosures. "State" captures the mean difference score between MD&As in a given state, which reflects the impact of state regulations on differential word choice.[19] "Prior Year" represents the mean difference between a given MD&A and that from the same municipality in the prior year (*Rawscore*). For example, a *Rawscore* of 0.27 suggests that 27% of the three-word combinations in an MD&A changed compared to the prior year. We include a small subset of information contained within the MD&A of the City of Bowie, MD in, 2011 and 2012 to illustrate our calculation

of *Rawscore* in Appendix A.[20] Overall, Fig. 1 shows that municipal managers do make MD&A disclosure modifications, and that the rate of content change is relatively constant during our sample period.

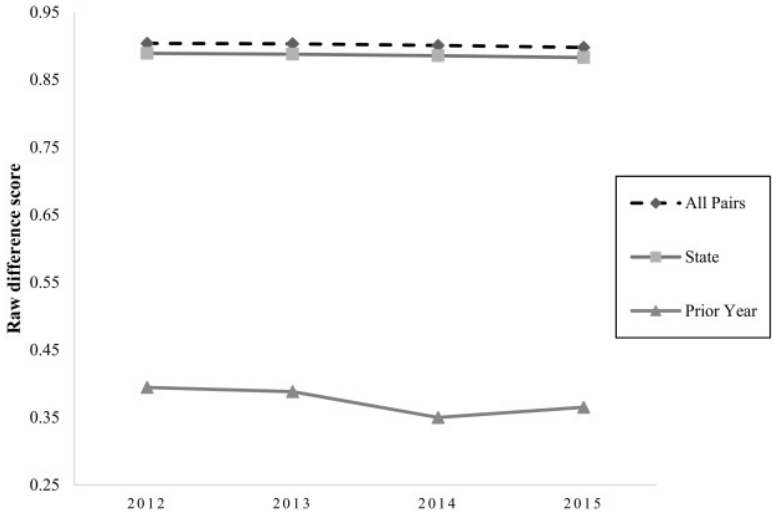

Fig. 1. This figure depicts how the MD&A disclosures in our sample differ over time with respect to a set of comparison groups over time. "All Pairs" captures the average raw difference between a given MD&A and all other MD&As in the sample. "State" captures the average raw difference between a given MD&A and the other MD&As in the same state, and "Prior Year" captures the average raw difference between a given MD&A and the MD&A of the same municipality in the prior year.

We note that the year-over-year mean for *Rawscore* is approximately 0.38 during our sample period (0.36 median). This average value implies that 38% of the three-word combinations (trigrams) changed for our MD&A sample compared to the prior year. Noteworthy is the fact that this value is higher than the 0.16 mean (or 0.11 median) reported in Brown and Tucker (2011), where the sample period is from 1997 to 2006 for corporate MD&A disclosures. We interpret this finding to suggest that municipal MD&A disclosures contain at least as much year-over-year content changes as the MD&A disclosures of corporate entities. We also note that *Rawscore* values between a given municipality and others within the same state do not differ significantly from those in the general population, implying that state disclosure rules have limited impact on textual content changes. Our results are comparable with Fig. 1 from Brown and Tucker (2011), where the figure shows that there is limited effect on textual content changes on a firm's MD&A between random pair and industry sector. Note that we use "state" instead of "industry sector," since our observations are municipalities.

One factor that could impact the likelihood of a particular trigram appearing in consecutive MD&A disclosures is document length. Following Brown and Tucker (2011), we regress *Rawscore* on the first five polynomials of MD&A word count (*Length*), and calculate a set of fitted values from the model (untabulated). We then subtract these fitted values from *Rawscore* to arrive at the adjusted *Score* measure used in our primary analyses.[21] Fig. 2 depicts the relationship between *Rawscore*, *Score*, and *Length* for our sample. In general, the data suggests that, consistent with Brown and Tucker's (2011) Fig. 2, when word counts are high, the changes in words (i.e., *Rawscore*) increases substantially (although not monotonically). The mean (median) for *Score* during our sample period is −0.01 (−0.03), which is very similar to 0.00 (−0.04) from Brown and Tucker (2011). Brown and Tucker (2011) shows the majority of MD&A documents are between 2000 and 8000 words in their sample, while we find that the majority of our sample MD&As are between 2000 and 7000 words.

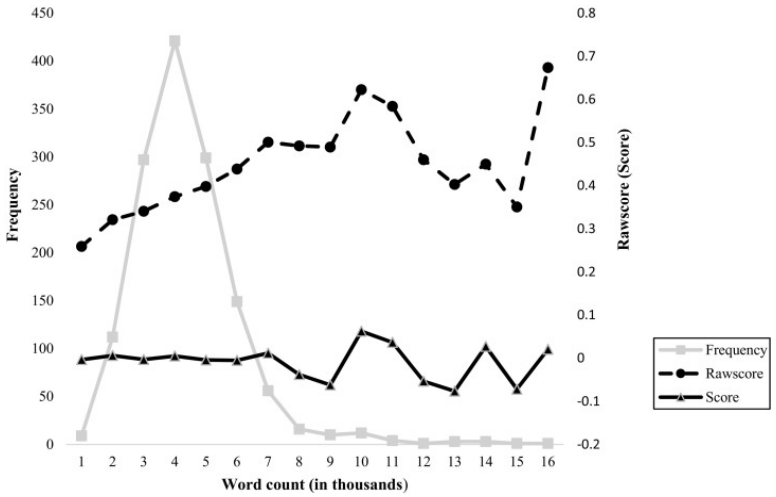

Fig. 2. This figure depicts the relationship between the raw difference score (*Rawscore*), adjusted difference score (*Score*), and word count frequency. *Score* is obtained via the Taylor expansion procedure described in Brown and Tucker (2011). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

3.2. Municipal MD&A modifications

Given the guidelines in GASB 34 regarding MD&A content, we perform an exploratory analysis of the determinants of municipal MD&A modifications. More specifically, we model MD&A changes as a function of economic changes, turnover, and regulatory factors as follows.

(1)

$$Score = f(Economic, Turnover, Regulatory, Controls)$$

Appendix B displays the definition and source of each variable used in our analyses. The dependent variable is the Brown and Tucker (2011) similarity score measuring content changes after adjusting for MD&A length (*Score*). We consider five measures of economic (external and internal) changes in our model, with each included using absolute values to focus on links between information content in MD&A disclosures and economic changes. We use GASB 34 (GASB, 1999) to develop our five measures. All measures are specifically mentioned as mandatory in the MD&A guidance found in GASB 34 (GASB, 1999, Cod.2200.109).

First, we consider the external economic environment by examining the health of the municipal area as a whole via the change in the unemployment rate ($|\Delta Unemployment|$). We predict that stakeholders will demand additional information from municipalities when economic conditions are changing, which would lead to a positive association with *Score*.

In terms of the internal economic environment, we include the year-over-year changes in net position of governmental activities ($|\Delta Net\ position|$) in alignment with GASB 34 (GASB, 1999, Cod. 2200.109b) to consider the overall change in the financial health of a given municipality (Pridgen & Wilder, 2013; Reck & Wilson, 2014). To analyze specific components that change the governmental activities' net position, we also consider in our models the fund balance for governmental funds ($|\Delta Fund\ balance|$) based on GASB 34 (GASB, 1999, Cod. 2200.109d) and two other measures specifically mentioned in GASB 34 (GASB, 1999, Cod. 2200.109f), namely the change in expenditures for capital assets ($|\Delta Capital\ asset\ expenditures|$) and the change in net debt (i.e., issuances minus retirements) ($|\Delta Net\ debt|$). All four of these internal statistics come from the *Reconciliation of the Statement of Revenues, Expenditures, and Changes in Fund Balances of Governmental Funds to the Statement of Activities* section in a given CAFR. These variables are included at values scaled by revenue from

government-wide governmental activities to limit the influence of size effects. If large changes in any of these four variables are associated with more discussion in current MD&A disclosures relative to the prior year, it would lead to a positive coefficient in our model.

We include two turnover proxies that consider the agents involved in creating and reviewing MD&A disclosures. First, Peterson et al. (2015) and Li (2017) identify managerial turnover as a possible factor that can explain variation in corporate narrative disclosures. Given that GASB 34 specifically designates the responsibility for constructing MD&A disclosures to financial managers (GASB, 1999, Cod. 2200.106), we include an indicator variable equal to one for a change in the top financial manager position (*Financial manager turnover*) based on details within yearly CAFR transmittal letters and predict a positive coefficient in our model (otherwise equal to zero). Moreover, following results from Peterson et al. (2015) and Brown and Knechel (2016) of lower content similarity of MD&A disclosures for new auditors, we include an indicator variable (*Auditor turnover*) equal to one when the financial statement auditor changes (otherwise zero) and predict a positive coefficient in our model.

Next, we consider the state-level governance environment (Baber & Gore, 2008) by creating an indicator variable (*Non-GAAP state*) equal to one for states with no formal GAAP mandate using the categories from the GASB (2008) report used by Kim et al. (2016), otherwise equal to zero.[22] We predict that municipal managers will supplement financial information with additional qualitative commentary to provide relevant information to stakeholders in the absence of state-level fiscal controls, which would result in a positive coefficient in our model.

We include three governance mechanisms as controls as follows. Given that professional managers should be in a better position to communicate with stakeholders, we utilize an indicator variable (*Council manager form*) equal to one for municipalities that use a council manager form of government (otherwise zero) and predict a positive coefficient in our model. We also designate an indicator variable equal to one if the municipality engages an auditor that conducted at least twenty A-133 audits at the office-level in, 2011 (*Specialist auditor*), or else equal to zero. If auditors with greater expertise encourage municipal managers to provide informative MD&A disclosures, this would lead to a positive coefficient in our model. Moreover, we create an indicator variable equal to one for municipalities obtaining the GFOA's Certificate of Excellence in Financial Reporting (*GFOA certificate*), otherwise equal to zero. Following the GFOA's guidelines may create additional structure to follow year-over-year, which could translate into similar textual characteristics and a negative coefficient in our model for *GFOA certificate.* Alternatively, excellence in financial reporting is a result of preparing reliable and useful financial information, which implies a positive coefficient for *GFOA certificate*. Therefore, we make no directional prediction for *GFOA certificate*.

We consider several demographic measures to control for municipality-specific conditions in our analysis. First, we include the log of *Population* to control for size, and the log of *County income* to consider the wealth level of a jurisdiction. Following past research (Arena & Dewally, 2012; López & Rich, 2017; Loughran & Schultz, 2005), we create an indicator variable equal to one (*Rural municipality*) to denote cities located more than 100 miles from any of the 50 most populated metropolitan areas in the U.S. (otherwise zero). Given that there could be fewer alternative informational sources (such as television and large newspapers) regarding municipal performance for rural jurisdictions, we predict that municipal managers will be more likely to share updates with stakeholders via changes in MD&A disclosures, leading to a positive coefficient in our model. We also use an indicator variable to control for MD&A disclosures that specifically include additional commentary related to pensions following the adoption of GASB 68 (*GASB68 impact*) for periods after June 15, 2014 (equal to one, otherwise zero), which is a source of variation in MD&A content that is unrelated to our hypotheses.

Next, we include *Report delay* to consider the impact of reporting delay on MD&A modification in line with a GASB (2011) brief suggesting that the usefulness of financial reporting diminishes with time to issuance. Based

on prior literature (Edmonds, Edmonds, Vermeer, & Vermeer, 2017; Henke & Maher, 2016), we use the logged number of days between fiscal year-end and the CPA signing date as our proxy for the timeliness of CAFR release. Finally, we include *ΔReport delay* as the logged change in days to report to consider pressures on the financial reporting system that could warrant additional qualitative commentary. Values for all continuous variables are winsorized at the 1% and 99% levels to reduce the impact of outliers, and standard errors are clustered on municipality based on Rogers (1993).

4. Results of main tests and additional analyses

Table 2, Panel A provides descriptive statistics for our entire sample, including the mean, median, standard deviation, and the 25% and 75% values.[23] As discussed previously, we note an average raw difference score of 0.38. The average change in the unemployment rate hovers around 1%, while the change in our economic measures are between 6% (|*ΔCapital asset expenditures*|) and 11% (|*ΔNet position*|) as a fraction of government-wide revenue from governmental activities. The findings also highlight that top finance manager and auditor turnover occur in 15% and 10% of observations, respectively, suggesting these are not common events. Additionally, 52% of municipality observations come from non-GAAP states, and the average municipality has a CPA firm signing date that is 230 days after fiscal year-end (*Report delay*).[24] Lastly, the change in report delay (*ΔReport delay*) is only −0.24 days, suggesting that report delay is relatively consistent within a given municipality.

Table 2. . Descriptive statistics (number of obs. =1142).

Panel A: All Observations					
	Mean	**P25**	**Median**	**P75**	**St. Dev**
Rawscore	0.38	0.26	0.36	0.47	0.16
Score	−0.01	−0.11	−0.03	0.07	0.15
|Δ Unemployment|	0.98	0.60	1.00	1.30	0.55
|Δ Net position|	0.11	0.04	0.08	0.15	0.12
|Δ Fund balance|	0.09	0.03	0.05	0.11	0.12
|Δ Capital asset expenditures|	0.06	0.02	0.04	0.07	0.06
|Δ Net debt|	0.07	0.00	0.02	0.09	0.12
Financial manager turnover	0.15	0.00	0.00	0.00	0.36
Auditor turnover	0.10	0.00	0.00	0.00	0.30
Non-GAAP state	0.52	0.00	1.00	1.00	0.46
Council manager form	0.81	1.00	1.00	1.00	0.39
Specialist auditor	0.51	0.00	1.00	1.00	0.50
GFOA certificate	0.92	1.00	1.00	1.00	0.27
Population	109.84	49.71	76.29	117.43	132.94
County income	46.82	37.39	43.84	53.30	13.18
Rural municipality	0.12	0.00	0.00	0.00	0.32
GASB68 impact	0.12	0.00	0.00	0.00	0.33
Report delay	229.56	185.00	212.00	261.00	81.33
Δ Report delay	−0.24	−22.00	−1.00	23.00	95.76
Govt-wide govt activities revenue	161.77	53.30	91.56	157.47	278.24

Panel B: Sorted by State-Level GAAP Mandates.							
	Non-GAAP state = 1 (n = 596)			**Non-GAAP state = 0 (n = 546)**			**Test of**
Variable	**Mean**	**Median**	**St. Dev**	**Mean**	**Median**	**St. Dev**	**Mean Diff**
Rawscore	0.41	0.40	0.17	0.35	0.33	0.15	***
Score	0.02	−0.01	0.17	−0.04	−0.06	0.13	***
|Δ Unemployment|	1.04	1.10	0.58	0.91	0.80	0.51	***
|Δ Net position|	0.14	0.10	0.14	0.08	0.06	0.08	***
|Δ Fund balance|	0.11	0.06	0.14	0.08	0.05	0.09	***
|Δ Capital asset expenditures|	0.06	0.04	0.06	0.05	0.04	0.06	
|Δ Net debt|	0.07	0.02	0.12	0.07	0.02	0.11	

Financial manager turnover	0.15	0.00	0.36	0.16	0.00	0.36	
Auditor turnover	0.11	0.00	0.31	0.09	0.00	0.36	
Council manager form	0.82	1.00	0.39	0.80	1.00	0.40	
Population	105.19	75.81	130.17	114.92	77.46	135.83	
County income	48.51	47.00	13.16	44.98	41.68	12.96	***
GASB68 impact	0.12	0.00	0.33	0.12	0.00	0.33	
Govt-wide govt activities revenue	140.41	86.33	266.25	185.17	101.53	289.12	***

This table provides summary statistics for the key variables in our analysis. Panel A is for the entire sample, while Panel B is segregated by whether a given municipality resides in a state without versus with formal GAAP mandates. For Panel B, we only include variables that are expected to vary from year-to-year for a given municipality. *, **, *** indicate significance at $p < 0.10$, 0.05, and 0.01 in tests of mean differences between the two subsamples. Variable descriptions are available in Appendix B, although the following items are included at raw values: *Govt-wide govt activities revenue* (in millions), *Population* and *County income* (in thousands).

To further explore the impact of state-level GAAP mandates, we present summary statistics segregated by whether municipalities reside in a GAAP or Non-GAAP state along with tests of mean differences between the two subsamples in Panel B. The findings imply that both *Rawscore* and *Score* are higher for municipalities located in a non-GAAP state, providing univariate evidence supporting H3. We also note that there are greater changes in two of the performance measures (|Δ *Net position*| and |Δ *Fund balance*|) in Non-GAAP states.

Table 3 contains pairwise correlations for all of the variables' in our analysis. The results note a positive 0.95 correlation between the *Rawscore* for textual similarity and the adjusted *Score*. Table 3 also indicates relatively higher correlations for the combinations of |*ΔNet position*|, |*ΔFund balance*|, and |*ΔCapital asset expenditures*|, suggesting changes in the internal economic conditions can directly affect each financial variable (similarly with |*ΔFund balance*| and |*ΔNet debt*|). Additionally, *Score* is correlated with |*ΔUnemployment*|, |*ΔNet position*|, |*ΔFund balance*|, *Auditor turnover*, and *Non-GAAP state*, which offer some additional univariate support for our hypotheses.

Table 3. Pairwise correlations (number of obs. =1142).

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
[1] Rawscore	1.00											
[2] Score	0.95*	1.00										
[3] |Δ Unemployment|	0.08*	0.06*	1.00									
[4] |Δ Net position|	0.07*	0.07*	0.05	1.00								
[5] |Δ Fund balance|	0.09*	0.08*	0.01	0.42*	1.00							
[6] |Δ Capital asset expenditures|	−0.04	−0.02	−0.06*	0.16*	0.16*	1.00						
[7] |Δ Net debt|	−0.01	−0.02	−0.10*	0.05	0.34*	0.18*	1.00					
[8] Financial manager turnover	0.04	0.05	0.02	−0.07*	−0.01	−0.09*	−0.02	1.00				
[9] Auditor turnover	0.11*	0.12*	0.09*	0.07*	0.02	−0.02	0.03	0.03	1.00			
[10] Non-GAAP state	0.19*	0.18*	0.12*	0.23*	0.14*	−0.03	−0.00	−0.01	0.04	1.00		
[11] Council manager form	0.06*	0.04	0.09*	0.05	0.06*	0.06*	−0.01	−0.07*	0.02	0.02	1.00	
[12] Specialist auditor	0.05	0.04	0.02	0.03	0.04	−0.01	0.08*	0.01	0.01	0.18*	−0.01	1.00
[13] GFOA certificate	0.00	−0.02	−0.04	−0.04	0.00	−0.03	0.03	−0.04	−0.02	−0.11	0.15*	0.02
[14] Population	0.05	0.00	−0.01	−0.03	−0.01	−0.11*	−0.03	0.07*	−0.01	0.04	−0.19*	0.02
[15] County income	0.00	0.02	−0.10*	0.09*	−0.03	−0.07*	−0.06	0.06*	0.04	0.14*	−0.11*	0.20*
[16] Rural municipality	−0.00	0.02	−0.24*	0.07*	0.06*	0.12*	0.08*	0.03	−0.05	0.09*	−0.12	0.05
[17] GASB68 impact	0.00	−0.02	0.01	0.00	−0.00	−0.02	0.02	0.06*	−0.03	−0.01	0.01	0.01
[18] Report delay	0.07*	0.04	0.12*	0.08*	0.11*	−0.01	−0.01	0.07*	0.08*	0.18*	−0.07	0.06
[19] ΔReport delay	−0.00	0.00	−0.04	0.02	0.07*	0.02	0.01	0.02	−0.02	0.00	−0.01	−0.02

	[13]	[14]	[15]	[16]	[17]	[18]	[19]
[13] GFOA certificate	1.00						
[14] Population	−0.05	1.00					
[15] County income	−0.04	0.05	1.00				
[16] Rural municipality	−0.07*	−0.04	−0.06*	1.00			
[17] GASB68 impact	−0.02	0.01	0.08*	−0.03	1.00		
[18] Report delay	−0.24*	0.07*	0.05	−0.01	0.00	1.00	
[19] ΔReport delay	−0.03	−0.00	−0.02	0.00	−0.01	0.56*	1.00

This table provides pairwise correlations for the variables in our study. * denotes significance at the 5% level. Variable descriptions are included in Appendix B.

Table 4 provides the results of our multivariate analysis based on Eq. (1). We find partial support for rejecting the null hypothesis that MD&A modification is not associated with economic changes in H1. First, we find that the absolute value of changes in unemployment rate is associated with MD&A content modification (|*ΔUnemployment*| = 0.02; *t*-statistic = 1.75) in Column 1, which suggests a 0.02 increase in our MD&A content change score for a 1% absolute change in the employment rate. However, this regression suggests no statistical evidence of an association between MD&A content changes and the change in net position. The results in Column 2 suggest that both absolute value of changes in the unemployment rate (|*ΔUnemployment*| = 0.02; *t*-statistic = 1.70) and fund balance from governmental funds (|*ΔFund balance*| = 0.09; *t*-statistic = 2.05) are positively associated with greater difference scores. Furthermore, we find no statistical evidence for the changes in capital asset expenditures or net debt, which could reflect incentives for municipalities to withhold explanations at the "account-level", and supports the GASB effort to re-examine GASB 34 with the goal of providing decision-relevant information to the users of government financial reports (i.e., Governmental Accounting Standards Board (GASB), 2021a, Governmental Accounting Standards Board (GASB), 2021b).

Table 4. Multivariate regression results.

	Predicted	**Raw coefficients**		**Standardized coefficients**	
	sign	**[1]**	**[2]**	**[3]**	**[4]**
|Δ Unemployment|	+/−	0.02*	0.02*	0.01*	0.01*
		(1.75)	(1.70)	(1.75)	(1.70)
|Δ Net position|	+/−	0.04		0.00	
		(0.78)		(0.78)	
|Δ Fund balance|	+/−		0.09**		0.01**
			(2.05)		(2.05)
|Δ Capital asset expenditures|	+/−		−0.06		−0.00
			(−0.75)		(−0.75)
|Δ Net debt|	+/−		−0.04		−0.00
			(−0.84)		(−0.84)
Financial manager turnover	+	0.024	0.02	0.02	0.02
		(1.54)	(1.44)	(1.54)	(1.44)
Auditor turnover	+	0.06***	0.06***	0.06***	0.05***
		(3.52)	(3.61)	(3.52)	(3.61)
Non-GAAP state	+	0.05***	0.05***	0.05***	0.05***
		(3.61)	(3.50)	(3.61)	(3.50)
Council manager form	+	0.01	0.01	0.01	0.01
		(0.83)	(0.79)	(0.83)	(0.79)
Specialist auditor	+	0.00	0.00	0.00	0.00
		(0.20)	(0.23)	(0.20)	(0.23)
GFOA certificate	+/−	−0.00	−0.01	−0.00	−0.01
		(−0.15)	(−0.18)	(−0.15)	(−0.18)
Population	+/−	0.01	0.01	0.01	0.01
		(1.08)	(0.93)	(1.08)	(0.93)
County income	+/−	0.00	0.01	0.01	0.01
		(0.11)	(0.14)	(0.11)	(0.14)
Rural municipality	+	0.01	0.02	0.014	0.02
		(0.62)	(0.65)	(0.62)	(0.65)
GASB68 impact	+	0.02	0.02	0.022	0.02
		(1.38)	(1.36)	(1.38)	(1.36)

Report delay	+/−	−0.03	−0.03	−0.025	−0.03
		(−0.82)	(−0.92)	(−0.82)	(−0.92)
ΔReport delay	+/−	0.01	0.01	0.01	0.01
		(0.57)	(0.56)	(0.57)	(0.56)
Constant	+/−	−0.08	−0.06	−0.05	−0.04
		(−0.21)	(−0.15)	(−0.14)	(−0.10)
Number of observations		1142	1142	1142	1142
Adjusted R-squared		0.08	0.08	0.08	0.08

*, **, *** indicate significance at $p < 0.10$, 0.05, and 0.01; based on two-tailed tests. Robust t-statistics are reported in parentheses, with standard errors clustered on municipality following procedures outlined by Rogers (1993). Year fixed effects are included but not reported.
This table presents ordinary least squares estimates based on Eq. (1), where the dependent variable is *Score*, which is a trigram-based difference score between a municipality's current and prior-year MD&A adjusted by document length using the Taylor expansion approach described in Brown and Tucker (2011). Columns [1] and [2] utilize raw coefficients, while columns [3] and [4] utilize standardized coefficients that are transformed to have a mean of 0 and standard deviation of 1. Variable descriptions are as described in Appendix B.

Given the potential difficulties in interpreting the raw coefficients in Columns 1 and 2 of Table 4, we also present results using standardized coefficients for our five economic performance measures in Columns 3 and 4, where each is transformed to have a mean of 0 and a standard deviation of 1. This allows the coefficient values to reflect a one standard deviation change in the performance variable. We find that a one standard deviation change in $|\Delta Fund\ balance|$ is associated with a 1% change in the total content of the MD&A, which is still significant given that this is only one of many items that is included in MD&A disclosures. Similarly, we note a one standard deviation in $|\Delta Unemployment|$ is related to a 1% change in textual MD&A content. We take these results as evidence that some municipal managers may respond to changing internal and external economic conditions via additional commentary within the MD&A.

Our H2 predicting that municipalities with top financial manager or auditor changes are associated with greater MD&A modification is also partially supported. There is no evidence of financial manager turnover being associated with the difference score. However, we find that auditor turnover is strongly associated with the difference score (*Auditor turnover* = 0.06; *t*-statistic = 3.52 in Column 1 and *Auditor turnover* = 0.06; *t*-statistic = 3.61 in Column 2). This suggests that there is a 6% MD&A modification score increase with municipalities engaging new auditors compared to municipalities retaining their current auditor. This follows results from Brown and Knechel (2016) suggesting that textual similarity increases over the auditor's tenure as opposed to greater differences with a newly engaged auditor (Peterson et al., 2015).[25] A potential explanation for the non-significant coefficient on *Financial manager turnover* involves internal promotions where the new manager is likely to be inculcated in the reporting style of the former manager. Another potential explanation is that a new financial manager might not make significant changes to the MD&A until his/her second year in the position or later.

Finally, we note support for H3 that municipalities in states without GAAP requirements have greater MD&A modification than municipalities in states with GAAP requirements. Our evidence points to a positive coefficient for states with no formal GAAP mandate (*Non-GAAP state* = 0.05; *t*-statistic = 3.61 in Column 1 and *Non-GAAP state* = 0.05; *t*-statistic = 3.50 in Column 2), which indicates a 5% MD&A modification score increase for a municipality in a non-GAAP state compared to a municipality in a GAAP state. This suggests that some municipal financial managers may supplement reported financial information with additional qualitative commentary when there are fewer regulatory requirements, as is the case in non-GAAP states (Baber & Gore, 2008).[26] Evidence consistent with this assertion comes from Nelson and Pritchard (2016), who find that firms

facing greater levels of litigation risk voluntarily revised their risk factor disclosures more from year to year under the Private Securities Litigation Reform Act (PSLRA) of 1995 than firms with lower levels of ligation risk. The "high litigation risk" designation from Nelson and Pritchard (2016) is analogous to the "low governance" scenario of a non-GAAP state in our analysis. The adjusted R-squared for our model is 0.08 for both specifications.[27] The explanatory power of our model is similar to Brown and Tucker (2011) which ranges from 0.058 to 0.064.

To further explore the impact of the regulatory environment via state-level GAAP requirements, we created a series of interaction terms between *Non-GAAP state* and each of our economic measures and report the results in Table 5. We find marginally significant positive coefficients on the two general financial performance *Non-GAAP state* interaction terms (*|ΔNet position|* x *Non-GAAP state* = 0.18; *t*-statistic = 1.79 in Column 1 and *|ΔFund balance|* x *Non-GAAP state* = 0.15; *t*-statistic = 1.75 in Column 2). Similar to Table 4, we also include results using standardized coefficients in Columns 3 and 4 of Table 5, which highlight that presence in a Non-GAAP state is associated with a 2% incremental change in MD&A content for a one standard deviation change in both *|ΔNet position|* and *|ΔFund balance|*, which is significant in comparison to the entire MD&A document. The Adjusted R-squared for our models are 0.08 and 0.09, respectively, which is also similar to Brown and Tucker (2011). We take these findings as further evidence that municipal managers supplement reported financial information with additional MD&A commentary content to increase transparency in the absence of state-level GAAP requirements. Municipalities in Non-GAAP states may also have incentives (e.g., the bond market) to voluntarily alter narrative disclosures based on internal economic circumstances (Gore, 2004). However, we find that location in a Non-GAAP state is associated with fewer content changes regarding net debt (*|ΔNet debt|* = −0.15; *t*-statistic = −1.73 in Column 2), implying that GAAP requirements do provide structure for commentary specific to debt and the bond market, but are not influential for promoting municipal narrative disclosures in Non-GAAP states.

Table 5. Multivariate regression results with Non-GAAP interactions.

	Pred. sign	**[1]**	**[2]**	**[3]**	**[4]**
|Δ Unemployment|	+/−	0.024**	0.03**	0.01**	0.01**
		(2.11)	(2.28)	(2.11)	(2.28)
|Δ Unemployment| x Non-GAAP state	+/−	−0.01	−0.01	−0.01	−0.01
		(−0.50)	(−0.76)	(−0.50)	(−0.76)
|Δ Net position|	+/−	−0.10		−0.01	
		(−1.23)		(−1.23)	
|Δ Net position| x Non-GAAP state	+/−	0.18*		0.02*	
		(1.79)		(1.79)	
|Δ Fund balance|	+/−		−0.03		−0.00
			(−0.39)		(−0.39)
|Δ Fund balance| x Non-GAAP state	+/−		0.15*		0.02*
			(1.75)		(1.75)
|Δ Capital asset expenditures|	+/−		−0.06		−0.00
			(−0.60)		(−0.60)
|Δ Capital asset expenditures| x Non-GAAP state	+/−		−0.01		−0.00
			(−0.05)		(−0.05)
|Δ Net debt|	+/−		0.06		0.01
			(0.99)		(0.99)
|Δ Net debt| x Non-GAAP state	+/−		−0.15*		−0.02*
			(−1.73)		(−1.73)
Financial manager turnover	+	0.02	0.01	0.02	0.02

		(0.94)	(1.04)	(0.94)	(1.04)
Financial manager turnover x Non-GAAP state	+/−	0.01	0.00	0.01	0.00
		(0.36)	(0.15)	(0.36)	(0.15)
Auditor turnover	+	0.06***	0.06***	0.06***	0.06***
		(2.85)	(2.82)	(2.85)	(2.82)
Auditor turnover x Non-GAAP state	+/−	−0.00	0.00	−0.00	0.00
		(−0.06)	(0.12)	(0.06)	(0.12)
Non-GAAP state	+	0.04	0.06**	0.05***	0.05***
		(1.59)	(2.30)	(3.56)	(3.29)
Council manager form	+	0.02	0.01	0.02	0.01
		(0.90)	(0.81)	(0.90)	(0.81)
Specialist auditor	+	0.00	0.00	0.00	0.00
		(0.11)	(0.21)	(0.11)	(0.21)
GFOA certificate	+/−	−0.01	−0.01	−0.01	−0.01
		(−0.19)	(−0.21)	(−0.19)	(−0.21)
Population	+/−	0.01	0.01	0.01	0.01
		(1.07)	(0.91)	(1.07)	(0.91)
County income	+/−	0.00	0.00	0.00	0.00
		(0.11)	(0.15)	(0.11)	(0.15)
Rural municipality	+	0.02	0.02	0.01	0.02
		(0.63)	(0.66)	(0.63)	(0.66)
GASB68 impact	+	0.02	0.02	0.02	0.02
		(1.31)	(1.33)	(1.31)	(1.33)
Report delay	+/−	−0.03	−0.03	−0.03	−0.03
		(−0.89)	(−0.98)	(−0.89)	(−0.98)
ΔReport delay	+/−	0.01	0.01	0.01	0.01
		(0.58)	(0.57)	(0.58)	(0.57)
Constant	+/−	−0.06	−0.05	−0.05	−0.03
		(−0.15)	(−0.14)	(−0.12)	(−0.07)
Number of observations		1142	1142	1142	1142
Adjusted R-squared		0.08	0.09	0.08	0.09

*, **, *** indicate significance at $p < 0.10$, 0.05, and 0.01; based on two-tailed tests. Robust t-statistics are reported in parentheses, with standard errors clustered on municipality following procedures outlined by Rogers (1993). Year fixed effects are included but not reported.

This table presents ordinary least squares estimates based on Eq. (1), where the dependent variable is *Score*, which is a trigram-based difference score between a municipality's current and prior-year MD&A adjusted by document length using the Taylor expansion approach described in Brown and Tucker (2011). Columns [1] and [2] utilize raw coefficients, while columns [3] and [4] utilize standardized coefficients that are transformed to have a mean of 0 and standard deviation of 1. Variable descriptions are as described in Appendix B.

4.1. Robustness checks

We also perform additional analyses to evaluate the robustness of our results. First, if financial managers modify disclosures in line with municipality conditions, we should see stronger associations with *Score* for economic changes that are large in magnitude. To test for this possibility, we created indicator variables to denote observations with above median values for changes in each of the five economic variables and included them in a regression based on Eq. (1). The results of this specification (untabulated) suggest that the findings of associations between the change in unemployment and MD&A content modification in Table 4 are driven by large external economic changes. Additionally, we divided each of the economic variables into quartiles, and

tested for differences in average *Score* among the top and bottom quartiles. We noted significant differences for the change in fund balance (untabulated), providing further support for our conclusions.

Since using absolute values to construct our economic change variables ignores the direction of the change, we also tested for the specific impact of increases in our economic change variables on MD&A content changes. More specifically, we create indicator variables equal to one (zero otherwise) to denote increases in each economic change variable found in Eq. (1), and include them in lieu of our performance measures.[28] The results of this supplementary analysis (untabulated) provide little evidence of differential associations between increases and decreases in our economic measures.

Our capital assets measure is based on the change in capital asset expenditures, but it is plausible that MD&A content changes are driven by the level of capital expenditures. As a result we collect data on capital asset additions (depreciable, non-depreciable, and combined) from the capital asset footnote and include them (scaled by government-wide governmental activities revenue) in our model. Inclusion of these measures on their own and with */ΔCapital asset expenditures/* (untabulated) confirms our results that suggest no statistically significant association between MD&A content change and capital expenditures as reported in Table 4.

Next, we recognize that incentives to disclose commentary about debt could be different for observations in which there is a net issuance of debt versus retirement. As a result, we created an indicator variable equal to one (zero otherwise) to denote years where more debt was issued than retired (occurring in 24% of observations), and included it in our model in lieu of */ΔNet debt/*. The results (untabulated) suggest a negative association between net debt issuance and *Score*, suggesting that municipal managers are more likely to modify commentary when there is debt retirement.

We also considered the impact of election cycles on MD&A content changes. Specifically, we utilized CAFRs and state/county election board websites to identify election years for both mayoral and council positions. We noted a mayoral election in 23% of observations, and a council election in 52% of observations (due to staggered election cycles). We included indicator variables to denote elections in year t as well as t-1, and included various combinations in our primary model. Given that the results from these alternative specifications yielded no significant coefficients for the election year variables and no change in our primary results, we chose not to tabulate them for brevity.

Next, we test for the possibility that links between poor reporting quality and the decision to change auditors are driving our results on *Auditor turnover*. Specifically, we performed a Heckman (1979) two-stage procedure with a first stage Probit model of auditor turnover as a function of factors that could impact the decision to change auditors. We included lagged population growth and net position deficit to consider municipality health, lagged report delay to consider the financial reporting system, and an indicator for council-manager form of government to consider the governance environment.[29] The second stage is our primary model including the inverse Mills ratio from the first stage regression. Our results for the second stage (untabulated) highlight no change to those presented in Table 4 using this approach, and a non-significant coefficient on the inverse Mills ratio. We take this finding as further evidence that links between reporting quality and auditor turnover are not driving our results.

We also standardized our difference scores according to the values for Non-GAAP states in a particular year, and re-performed our primary tests, noting similar results to those presented in Table 4, Table 5. Lastly, we scaled our independent variables by total primary government assets and governmental funds revenue instead of government-wide governmental activities revenue in our model, and included an office-based measure of auditor specialization, and noted similar results (untabulated).

5. Conclusion

We investigate the determinants of year-over-year content modifications of municipal MD&A disclosures. Our research is motivated by GASB's current project to re-examine GASB 34 to provide more decision-relevant information to stakeholders. We think GASB's initiatives and our study are both very timely, since municipalities are likely facing financial challenges due to the COVID-19 pandemic, which increases the importance of transparency by municipal managers. We find that at least some municipal managers alter qualitative content in response to external and internal economic changes, but enhanced disclosures might be needed in areas such as debt and capital expenditures relative to the magnitude of the changes. Our study contributes to the disclosure literature, as it is the first to investigate MD&A content modifications where disclosure guidelines are provided by the standard setter. We suggest several key takeaways useful to future researchers and practice.

First, our mixed results on the factors associated with municipal MD&A year-over-year content changes signals that some information may not be prominent enough for various users' understanding. Thus, the types of information disclosed about specific accounts may benefit from increased guidance coming from GASB's reporting improvement projects (GASB GASB, 2021b). Increasing the narrative on explanations of significant yearly changes should increase the context for a non-expert audience. Reducing the amount of “boilerplate” or non-changing content should direct users' attention to the most meaningful changes over the course of the fiscal year. Therefore, we think the increased transparency between municipalities' managers and broad stakeholders would enhance the informativeness of municipalities' MD&A and create greater credibility for the management of the municipalities.

Second, the data shows that changes in the unemployment rate and fund balance from governmental funds are associated with greater year-over-year differences in MD&A content. This suggests that municipalities modify their qualitative disclosures in response to “big-picture” economic changes. However, our findings also highlight that “account-specific” changes (namely in capital asset expenditures and net debt) may not be captured in the narrative to the extent GASB envisioned, or such narrative may be lost among other language. Researchers seeking to use textual analysis to delineate the impact of more localized events may consider separately segmenting and analyzing the discussion within the MD&A regarding economic updates. Likewise, producers of qualitative disclosures may consider paying special attention to, or creating a separate section, focused on non “big-picture” changes if they wish to call attention to local or one-off events affecting “account-specific” changes, particularly in relation to ongoing capital projects. Further, users of these reports may currently need to seek information outside the report if seeking qualitative disclosure of non-“big picture” changes.

Third, we also find that auditor turnover is associated with greater changes in MD&A content. This might occur because new auditors may request MD&A to be rewritten for clarity, accuracy, or consistency. Fourth, we find that location in a non-GAAP state is associated with greater changes in MD&A content, and that those content changes within a non-GAAP state vary directly with changes in both net position of governmental activities and fund balance for governmental funds. We attribute this finding as possible evidence that municipal managers view qualitative content as a valuable way to reduce information asymmetry with stakeholders when state governments do not centralize fiscal control over municipalities. An alternative potential explanation is the mechanical impact that additional boilerplate language in GAAP states would have on our measure of year-over-year changes.

Several avenues for future research are suggested by our results. First, linguistic analysis could include the use of predictive analytics and artificial intelligence to analyze further consequences of MD&A changes. Further, it is possible MD&A changes may vary with the size of budget-to-actual variances, which is especially salient as municipalities adjust to potentially extreme financial challenges imposed by the COVID-19 pandemic. These ideas could be combined in a study examining which MD&A changes might reflect or produce positive or

negative effects on future outcomes. Relatedly, future research could examine a second order model to predict future consequences of MD&A changes. Research could also examine municipal disclosure quality as it is linked through a blockchain record keeping system, or from a big data perspective. Finally, there is the possibility to look at the impact of qualitative changes on other outcomes such as grant funding.

This study contains some inherent limitations regarding generalizability and interpretation. Our analysis is based on municipal MD&A disclosures from the years, 2011 to 2015 from relatively large municipalities that responded to the, 2011 ICMA survey and are subject to the Single Audit Act (OMB, 2003). As a result, our results may not generalize to all municipalities, especially smaller ones, or beyond 2015. While we consider municipal MD&A disclosures in this study, there may be other disclosure sources that we do not examine, such as letters of transmittal, notes to the financial statements, and textual information from local government websites. Next, there is the possibility that large report delays reduce the usefulness of financial information to stakeholders.[30] Further, although our measure of textual changes is based on current literature (Brown & Tucker, 2011), our statistical method does not involve interpretation of any changes for relevance. While our results suggest that at least some managers see changing narratives as important, even if delays occur, we only have preliminary data by way of exploratory interviews to learn which key topics matter most. Future research is needed to tease out whether there are specific MD&A changes deemed to be most valuable. Lastly, many municipalities have very stable economic conditions, which may reduce the need for extensive commentary in MD&A disclosures. Even still, our study provides an exploratory step toward understanding the drivers of narrative disclosures in the public sector.

Declaration of Competing Interest

None.

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Appendix A. Abbreviated MD&A Comparison - Bowie, Maryland

2011 compared to 2012 (*Rawscore* of 0.26 between two sections). Differences listed in **bold**.

2011	**2012**
Overview of the Financial Statements	Overview of the Financial Statements
The financial section of the CAFR consists of three parts – management's discussion and analysis (this section), the basic financial statements and required supplementary information. This discussion and analysis are intended to serve as an introduction to the City of Bowie's basic financial statements. The City of Bowie's basic financial statements are comprised of three components: 1) government-wide financial statements, 2) fund financial statements, and 3) notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements...	The financial section of the CAFR consists of three parts – management's discussion and analysis (this section), the basic financial statements and required supplementary information. This discussion and analysis are intended to serve as an introduction to the City of Bowie's basic financial statements. The City of Bowie's basic financial statements are comprised of three components: 1) government-wide financial statements, 2) fund financial statements, and 3) notes to the financial statements. This report also contains other supplementary information in addition to the basic financial statements...

(this section is identical to 2012)	(this section is identical to 2011)
Net Assets	Net Assets
...At the end of the current fiscal year, the City is able to report positive balances in all three categories of net assets, both for the government as a whole, as well as for its separate governmental and business-type activities. The same situation held true for the prior fiscal year.	...At the end of the current fiscal year, the City is able to report positive balances in all three categories of net assets, both for the government as a whole, as well as for its separate governmental and business-type activities. The same situation held true for the prior fiscal year.
The governmental activities investment in capital assets, net of related debt increased by $2.4 million or 3.4%. Most of this increase is attributable to the construction of the new City Hall.	The governmental activities investment in capital assets, net of related debt increased by $2.47 million or **3.46%**. Most of this increase is attributable to **street improvements and the completion** of the new City Hall.
The business-type activities investment in capital assets, net of related debt increased by $1.2 million or 6.1%. Improvements to the Wastewater Treatment Plant account for this significant increase...	The business-type activities investment in capital assets, net of related debt **decreased by $0.6 million or 2.7%. The Wastewater Treatment Plant underwent significant upgrades and renovations to implement the Enhanced Nutrient Removal process. The decrease in capital assets, net of related debt accounts for the retirement of old components at the Wastewater Treatment Plant which were replaced during the renovations**...

Calculation of *Rawscore* between two sections	
Resemblance $\frac{\lvert A \cap B \rvert}{\lvert A \cup B \rvert} = \frac{\lvert A \cap B \rvert}{\lvert A \rvert + \lvert B \rvert - \lvert A \cap B \rvert}$	*Rawscore* = 1 - Resemblance
Total number of trigrams in 2011 $\lvert A \rvert$ = 175 Total number of trigrams in 2012 $\lvert B \rvert$ = 206 Total number of common trigrams $\lvert A \cap B \rvert$ = 162	Resemblance = 162/(175 + 206) – 162 Resemblance = 0.74 *Rawscore* = 0.26

Appendix B. Variable definitions

Variable	**Definition**	**Source**
Rawscore	Trigram-based difference score between a municipality's current and prior-year MD&A. See Appendix A for more details.	CAFRs
Score	Raw difference score adjusted for document length using the Taylor expansion approach from Appendix B of Brown and Tucker (2011).	CAFRs
Independent Variables		
$\lvert \Delta$ *Unemployment* $\rvert$	Absolute value of change in calendar-year unemployment for a given municipality (in percent)	Local Area Unemployment Statistics provided by the Bureau of Labor Statistics
$\lvert \Delta$ *Net position* $\rvert$	Absolute value of changes in net position of governmental activities scaled by government wide revenue from governmental activities.	CAFRs
$\lvert \Delta$ *Fund balance* $\rvert$	Absolute value of changes in fund balance for governmental funds scaled by government wide revenue from governmental activities.	CAFRs

|Δ Capital asset expenditures|	Absolute value of changes in capital asset expenditures scaled by government wide revenue from governmental activities.	CAFRs
|Δ Net debt|	Absolute value of changes in net debt (issued – retired) scaled by government wide revenue from governmental activities.	CAFRs
Financial manager turnover	Indicator variable equal to one for municipalities with a new top financial manager in a given year (zero otherwise).	CAFRs
Auditor turnover	Indicator variable equal to one for municipalities with a new financial statement auditor in the current year (zero otherwise).	Federal Audit Clearinghouse Single Audit Database (SAD)
Non-GAAP state	Indicator variable equal to one if a municipality is located within a state (AL, AK, AR, CA, DE, ID, IL, IN, IA, KS, MI, MO, MT, NE, NJ, NY, ND, OK, OR, PA, SC, SD, VT, WA, WV) with no formal GAAP mandate (zero otherwise).	Kim et al. (2016)
Controls		
Council manager form	Indicator variable equal to one for municipalities that employ a professional chief executive (zero otherwise).	ICMA 2011 Municipal Form of Government Survey (ICMA Survey)
Specialist auditor	Indicator variable equal to one for municipalities with a financial statement auditor that conducted at least 20 A-133 audits in 2011 out of the relevant office (zero otherwise).	SAD
GFOA certificate	Indicator variable equal to one for municipalities receiving the Government Finance Officers Association Certificate of Excellence in Financial Reporting (zero otherwise).	Government Finance Officers Association
Population	Log of the number of municipality citizens (in thousands).	ICMA Survey
County income	Log of the per capita personal income measured at the county level (in thousands).	American Community Survey administered by the U.S. Census Bureau
Rural municipality	Indicator variable equal to one for cities located more than 100 miles from any of the 50 most populated metropolitan areas in the U.S. (zero otherwise).	SAD / Google Maps
GASB68 impact	Indicator variable equal to one (zero otherwise) if the municipality discloses a GASB 68 impact within the MD&A.	CAFRs
Report delay	Log of the number of days between fiscal year end and CPA sign off date	SAD
ΔReport delay	Log of the change in *Report delay* between prior and current year	SAD
Other		
Govt-wide govt activities revenue	Revenue from government wide governmental activities (in millions)	CAFRs

Note that the internal economic variables are scaled by *Govt-wide govt activities revenue*.

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Notes

[1] The Securities and Exchange Commission (not the Financial Accounting Standards Board) establishes MD&A guidelines for companies listed on U.S. exchanges, and guidelines are nearly absent for many organizations subject to International Financial Reporting Standards (IFRS) (Barker & Eccles, 2018).

[2] Note that the GASB has an ongoing project addressing whether to rename the Comprehensive Annual Financial Report (CAFR) to the Annual Comprehensive Financial Report (ACFR) (GASB, 2021c).

[3] The primary users of governmental financial reports are the citizenry, legislative and oversight bodies, and investors and creditors, based on GASB Concept Statement No. 1 *Objectives of Financial Reporting* (GASB 1987).

[4] The GASB codification can be accessed via the Governmental Accounting Research System (https://gars.gasb.org/). We reference the relevant codification section when appropriate.

[5] We use the term "boilerplate" to refer to standardized text lacking information content for users, which is based on language in the GASB revision project's "common template" (https://www.gasb.org/jsp/GASB/Page/GASBSectionPage&cid=1176163800724) and "language that governments carry over from one year to the next without changing" (https://www.gasb.org/jsp/GASB/Document_C/DocumentPage&cid=1176171975832), and recent literature (for example, Brown & Tucker, 2011).

[6] GASB's Financial Reporting Model project completed its Exposure Draft in 2020, and plans for a final draft by 2022 (GASB 2021b).

[7] GASB also initiated a project in 2018 to create a conceptual framework for the development and evaluation of financial statement note disclosures (GASB 2021a) (https://www.gasb.org/jsp/GASB/GASBContent_C/ProjectPage&cid=1176171330326).

[8] In this study, we examine both external and internal economic measures. Specifically, we use the change in unemployment rate as an external measure, and changes in net position, fund balance, capital asset expenditures and net debt as internal measures.

[9] A state or local government's MD&A should at least include a discussion of the basic financial statements and statement relationships, condensed information from the government-wide financial statements, descriptions of facts or conditions that affect the entity's financial condition or operations, and analysis on the government's financial position, individual funds, budgeted to actual variances, and significant debt and capital assets changes (GASB 1999).

[10] As an example, the North Carolina Department of State Treasurer provides guidance at: http://www.nctreasurer.com/slg/GASB/Documents/WritingYourMDA.doc

[11] Citizenry, legislative and oversight bodies, investors, and creditors are considered primary users of governmental financial statements (GASB 1987). Further support for the importance of citizens as a primary user of Comprehensive Annual Financial Reports (CAFR) is highlighted by the fact that CAFRs commonly begin with a Letter of Transmittal addressed to the mayor, council, and citizens of the municipality.

[12] In order to add depth to our understanding of the creation of the MD&A narrative disclosure, we solicited feedback from contacts at GASB and multiple municipal financial managers. Both groups indicated such disclosures are written for citizens and other governmental agencies and suggest that the narrative is valuable to citizens when done well. The municipal financial managers felt that citizens are understanding of delays in the construction of the CAFR and still find the information useful. Our GASB contacts believe that while some narratives are done well and are extremely valuable, many disclosure narratives could be improved. As a result, the GASB 34 re-examination project is likely to suggest additional topics and areas targeted for narrative disclosure.

[13] In related research, managers' linguistic tone within municipal MD&As is found to be associated with future reporting quality proxies of both reporting delay (Rich et al., 2016) and internal control weaknesses (Rich et al., 2019).

[14] The sample selection procedure utilizes the 3566 localities that responded to the 2011 Municipal Form of Government Survey conducted by the International City/County Management Association (ICMA). Similarly, we focus on 679 municipalities having more than 25,000 citizens to facilitate our data collection process. The number of municipalities in our final sample is 362 after deleting observations not subject to the Single Audit Act (OMB, 2003) or those lacking other data requirements.

[15] The ICMA survey is performed every 5 years, so we chose this as our start period to facilitate consistent governance data.

[16] We note that the last year of our sample period was the first year that Uniform Guidance on federal grant audits was effective. Yearly indicator variables in our models should control for these new implementation guidelines.

[17] We follow the methodology using trigrams established in Brown and Tucker (2011) and Nelson and Pritchard (2016). We specifically exclude numbers to evaluate whether financial managers do more than change numbers in the text.

[18] Note that $S(A) \cup S(B)$ reflects the union between two MD&A disclosures (i.e. all word combinations in either document), while $S(A) \cap S(B)$ is the intersection (i.e. word combinations that appear in both documents). Thereby, the more similar trigrams between two MD&As, the higher the R-value. For in-depth detail regarding resemblance score methodology and statistics, see Lyon, Malcolm, and Dickerson (2001).

[19] "State" in Fig. 1 is analogous to "industry" in Brown and Tucker (2011).

[20] The complete MD&A for the City of Bowie, MD consists of 14 pages in each year, 2011 and 2012.

[21] See Appendix B of Brown and Tucker (2011) for additional details.

[22] A list of non-GAAP states can be found in the variable's description within Appendix B. It should be noted that virtually our entire sample presents GAAP-compliant financial statements, including those municipalities located in states that do not have a GAAP mandate.

[23] To provide greater insight into our sample, the average municipality in our sample had total assets of $934 million and total liabilities of $394 million.

[24] In supplementary analysis, we compare the values of *Score* for subsets of our sample that are a) above/below the median value for report delay, and b) above/below 180 days of report delay. *t*-tests between these two subsamples imply no statistically significant differences in *Score* (*t*-statistics of −0.93 and −0.33, respectively). Our conversations with GASB personnel and financial managers suggest that changes in MD&A may still serve as useful signals about the quality of reporting by specific municipalities that are more forthcoming even if the reports are not timely.

[25] We also examined turnover between different types of auditors by including various combinations (*Non-specialist to specialist*, *Specialist to specialist*, *Specialist to Non-specialist*, and *Non-specialist to Non-specialist*) in our model in lieu of the *Auditor turnover* variable. All of these variables had positive and significant coefficients except for *Non-specialist to specialist*. We take these findings as some evidence that auditor turnover has an association with future MD&A disclosures without regard to the type of auditors involved.

[26] An alternative explanation for the difference that we find between GAAP and non-GAAP states is the following. In an untabulated test, we compared the word count of MD&A disclosures by municipalities in GAAP versus non-GAAP states. The results highlight significantly longer MD&A sections by municipalities in GAAP states (t-statistic = 3.52), providing some evidence that GAAP requirements increase the volume of MD&A content. Since our measure of year-over-year change is scaled by total word count (i.e., number of trigrams), the difference we find between GAAP and non-GAAP states could be due to greater use of boilerplate language in GAAP states.

[27] A review of variance information factors (VIF) highlights no values above 2, suggesting that multicollinearity does not have a detrimental impact on our results.

[28] We also ran a separate model that included the interaction between the increase indicator and the performance measure to capture sensitivity, also noting no change in results.

[29] Results from the first stage regression suggest that auditor change is associated with lagged net asset deficits (coefficient = 0.28; *t*-statistic = 2.26) and lagged report delay (coefficient = 0.53; *t*-statistic = 3.06). We interpret these results as suggesting that less "profitable" municipalities and those with financial reporting challenges are more likely to change auditors.

[30] We note that municipalities often release CAFRs well after the dates when key events occur. Interviews with two GASB officials and five municipal finance managers both suggest that citizens find disclosures about economic conditions and the decisions made in light of these conditions to be valuable (especially from a non-accounting point of view), even if a great deal of time has passed. Likewise, experts who typically have access to quantitative information may seek to learn more about why numerical changes occurred. Thus, even if time passes this discussion appears to have value.