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MD&A SIMILARITY WITH LOCAL INDUSTRY PEERS

A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

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DEDICATION

I dedicate this dissertation to my parents, Ping Wang and Lin Zhu.

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ABSTRACT

This study investigates the impact of interacted industry peer firms on management decisions regarding Management Discussion and Analysis (MD&A). Given that geographic industry clusters facilitate inter-organization interactions among its participants, I examine and find that industry peer firms from the same geographic industry clusters adopt more similar MD&A disclosures, and inter-firm social networks function as a channel that facilitates MD&A similarity among these interacted industry peers. In addition, the results suggest that MD&A similarity among local industry peers is moderated by market environments and varies among different types of firms. The further analyses show after firms relocate, their MD&As become more similar to those issued by the industry peers located in the new clusters, and firms contain more similar forward-looking MD&A disclosures with the industry peers from the same geographic industry clusters. The findings are consistent with the idea that interacted industry peer firms influence individual firms' MD&A disclosure strategies. Finally, I provide initial evidence that MD&A similarity among industry peers is informative and is a desired attribute. Overall, this study advances our understanding of how managers prepare MD&A disclosure by exploring the convergence of MD&As among industry peers, and it extends the literature on voluntary disclosure and provides new insights on peer firm effects.

CHAPTER I. INTRODUCTION

Management Discussion & Analysis (MD&A) is widely recognized as one of the most important sections of financial reports (Tavcar 1998; Barron, Kile, and O'Keefe 1999). Over the past several decades, regulators and scholars have given considerable attention to MD&A disclosure. The Securities and Exchange Commission (SEC) issues guidelines for strengthening MD&A disclosures and puts ongoing effort into improving these disclosures (SEC 1968, SEC 1974, SEC 1980, SEC 1987, SEC 1989, and SEC 2003). The literature on MD&A also extensively examines the implications of these disclosures in different settings and documents its pivotal role in providing qualitative information such as forward-looking statements (e.g., Muslu, Radhakrishnan, Subramanyam, and Lim 2015; Durnev and Mangen 2020). However, the concern has been raised that MD&A is potentially not useful due to the duplication of disclosures in financial reports and the lack of year-over-year modifications (Li 2010; Brown and Tucker 2011; Cazier and Pfeiffer 2017; Li 2019).

In January 2020, the SEC proposed modernizing and simplifying MD&A disclosure to promote the Commission's principles-based nature, to eliminate duplication, and to tailor it to the registrant's business and circumstances, which will offer firms greater flexibility and judgment in providing MD&A disclosures. By November 2020, the SEC adopted the amendments that intend to improve disclosure by facilitating thoughtful and meaningful discussion and analysis, discouraging repetition, and reducing compliance burdens. Given the flexible disclosure format, the non-mandatory audit (Hüfner 2007), and the voluntary nature of much of the content, knowledge about how firms use their discretion to prepare MD&A disclosure is becoming more important as it will advance our understanding of this important disclosure and contribute to the enhancement of its usefulness. But despite the importance of MD&A, relatively little is known

about the factors that influence how management provides these disclosures or the determinants of its qualitative content. In response to the concerns and ongoing discussions about the informativeness and relevance of MD&A disclosure, this study investigates how industry peer firms and their interactions affect the content of MD&A disclosures.

Nowadays, more and more industry peer firms tend to be spatially concentrated in certain areas. Geographic industry clustering is an ongoing trend (Gordon and McCann 2000). For instance, high-tech firms located in "Silicon Valley" surrounding San Francisco, California and the recent cluster of high-tech industries in Austin, Texas are examples of geographic industry clusters. This spatial aggregation of interconnected firms generates many positive externalities among its participants (e.g., Ellison and Glaeser 1999; Zhang and Hu 2008; Almazan, Motta, Titman, and Uysal 2010; Ellison, Glaeser, and Kerr 2010). In particular, when industry peer firms are located in the same geographic industry clusters, they experience an increase in inter-organization interactions such as competition, cooperation, information sharing, and knowledge exchange (Rosenfeld 1997; Audretsch 1998), and these informal and formal inter-firm interactions affect peer firms' decisions and strategies (Chandler, Hagström, and Sölvell 1999). Therefore, the growing industrial clusters provide a novel setting to explore the impacts of interacted industry peer firms on financial disclosures such as the MD&A.

In this study, I examine whether industry peer firms from the same industry cluster influence management decisions of MD&A disclosure. Industry peer firms play an essential role in affecting managers' disclosure strategies. Managers not only have incentives to learn from peer firms' MD&A disclosures but also consider the effects of their own disclosures on peer firms. The recent study indicates that with the spillover effects of MD&As, management decision relies on peer firms' MDA disclosures (Durnev and Mangen 2020). Moreover, as suggested by institutional

theory (e.g., Meyer and Rowan 1977; DiMaggio and Powell 1983), firms face institutional pressures to mimic the action of peer firms and tend to adopt similar disclosure to peer firms to gain benefits such as credibility and avoiding uncertainty. Considering geographic industry clusters facilitate the interactions and mutual dependence among local industry peers, which stimulates learning opportunities, facilitates the spillover effects, and fosters externalities among them, I posit that industry peer firms from the same geographic industry clusters are more likely to affect management decisions of MD&A disclosure and converge their MD&As, which leads to MD&A disclosure similarity among local industry peers. Therefore, to test the prediction, I adopt the vector space model (VSM) to assess the textual similarity of MD&A disclosures among each firm and its two-digit SIC industry peers in the same year and construct a sample of six-million firm-peer pair observations from 2003 to 2018 to conduct pair level analyses. Following previous literature, I define a geographic industry cluster as a metropolitan statistical area (MSA) and use the locations of firms' headquarters to determine whether a firm and its two-digit SIC industry peers are local peers from the same geographic industry clusters.

Consistent with the prediction, I find that industry peer firms from the same geographic industry clusters adopt more similar MD&As. This suggests that these interacted industry peer firms affect management decisions of MD&A disclosure, which leads to the convergence of their MD&As.

To further understand the impact of industry peer firms from the same geographic industry clusters on management decisions of MD&A disclosure, I next explore the role of inter-organization social networks. As inter-organization social networks promote firms' interactions and interdependence, such as knowledge exchange and information sharing, I expect that the existence of social networks among co-located peer firms enhances the effect of these interacted

industry peer firms on management decisions regarding MD&As. As expected, the analyses show that MD&A similarity among local industry peers is greater when these interacted firms share the same directors, have the same institutional investors, and are served by the same auditors, and are located in the same areas with strong local social networks. Overall, the evidence supports the idea that inter-organization social networks function as a channel that promotes the impact of industry peer firms from the same industry clusters, which enhance MD&A similarity among local industry peers.

Then I turn to investigate how the influence of these interacted industry peers on MD&A disclosure is moderated by market environments. Institutional theory suggests that uncertainty is a main force that drives imitation. When a market is highly unpredictable and variable, firms face more challenges to make and defend their decisions and are under more pressure to justify their judgments under uncertainty. In this case, a firm has more intentions to study how peer firms perceive and respond to the market uncertainty and then model itself after these industry peers. In other words, market uncertainty will strengthen the influence of interacted peer firms on management decisions regarding MD&A disclosure. Consistent with this assertion, I find that MD&A similarity among local industry peers is more pronounced when the market experiences high revenue or earnings volatility. On the other hand, signaling theory (Connelly, Certo, Ireland, and Reutzel 2011) suggests that firms have an incentive to voluntarily disclose unique information to distinguish themselves from their competitors. Given that, I test and document that co-located industry peer firms issue less similar MD&A disclosures when the market is competitive, which implies a tradeoff between convergence and distinguishment faced by managers of these interacted firms. These findings provide further evidence on the link between the effects of industry peer firms from the same industry cluster and management decisions regarding MD&A disclosure.

Next, I explore the effect of these interacted peer firms across different types of firms. I expect and observe that that young firms and centralized firms are more likely to issue similar MDAs to those industry peers from the same geographic industry clusters but not leading firms or mature firms. The results suggest that firms with more incentives to gain benefits like credibility (e.g., young firms) or pay attention to local industry peers (e.g., centralized firms) are more likely to be affected by local peers and converge their MD&As. In contrast, as implied by prior literature that managers are likely to obfuscate information when performance is bad, I find that loss firms and firms having a negative earnings surprise tend to issue dissimilar disclosures to local industry peers.

In addition, I employ a difference-in-differences research design to explore how firms' MD&A similarity changes around relocations. The test shows that after relocations, firms' MD&As become more similar to the industry peers co-located in the new geographic industry clusters, implying the causal effect of the peer firms from the same geographic industry cluster on MD&A similarity because it is unlikely that changes in MD&A precede relocation.

Moreover, as forward-looking MD&A disclosure is the most demanded and informative MD&A component, I perform further analyses of forward-looking MD&A disclosure similarity among industry peer firms and find that industry peers located in the same geographic industry cluster contain more similar forward-looking disclosures in their MD&As. The finding provides additional evidence on the impact of industry peer firms from the same industry cluster on management decisions of the MD&A as disclosure of forward-looking information in MD&A is voluntary, future-oriented, under greater judgment and discretion of management, and contains less compliance-oriented and boilerplate discussions. Furthermore, I find consistent results in the random subsample settings: when I remeasure forward-looking MD&A disclosure similarity after

removing sentences contain the information about a specific location, using the unique word dictionary of industry, or creating the unique word dictionary by year. These findings suggest that MD&A similarity among local peer firms is less likely driven by common practices or underlying economic forces and corroborate the main argument that peer firms from the same industry clusters affect management decisions regarding MD&A disclosure.

To address the concerns about omitted variables and endogeneity issues that peer firms from the same industry cluster are likely to be self-selected and share some economic similarities, which may drive the results, I conduct the matched sample test to assess the robustness of the main finding. Specifically, as inspired by De Franco, Kothari, and Verdi (2011) and Barth, Landsman, Lang, and Williams (2012), I proxy economic similarity among industry peers at the pair level based on the idea of accounting comparability that is largely determined by firms' economic similarities and driven by economic fundamentals. And I construct the matched sample by matching each firm-peer pair from the same industry clusters with those from different clusters on economic similarity. I show the main result continues to hold. And additionally, I find that the main finding remains the same after including the additional controls for economic similarity among firm-peer pairs. Overall, the tests alleviate the concerns and indicate that economic similarity is less likely to explain MD&A similarity among local industry peers.

The main inference is also robust after using alternative measures of MD&A similarity, redefining geographic industry clusters, and using different groups of firm peer pairs. Collectively, the findings suggest that the industry peers from the same geographic industry cluster affect management decisions regarding the MD&A and lead to the convergence of their MD&As.

Finally, since it is less clear whether MD&A similarity among industry peers is a desired attribute, I extend my analysis to explore its potential implications. For the first test, I examine and

find evidence that firms issuing similar MD&A with industry peers tend to modify MD&A disclosures year over year, which suggests that firms converge MD&A disclosure through modification rather than driven by boilerplate language or repetitive discussion. And I next investigate the implications of MD&A similarity among industry peers on its users and find that firms issuing similar MD&As with industry peers tend to have higher analyst coverage, less forecast dispersion, and more accurate forecasts. This initial evidence suggests that MD&A similarity among industry peers is informative and is a desired attribute of MD&A disclosure, which reduces information asymmetry and improves the information environment.

This study contributes to the literature in several ways. First, this study extends the literature on voluntary corporate disclosure by exploring MD&A similarity among industry peer firms. It is among one of few large-sample, pair-level analyses on a distinct attribute of MD&A disclosure. The results suggest how firms that prepare MD&A disclosures are affected by interacted industry peer firms and firms act and rely on peers' publicly available MD&A disclosures, which advance our understanding of MD&A disclosure and responses to the concerns and ongoing discussions about the informativeness and relevance of MD&A disclosure.

Second, this study contributes to the growing literature on textual analysis of MD&A disclosure. Despite the prior literature on the within-firm variations of MD&A textual features like modification, tone, and quantity, the determinants and implications of textual similarity among peer firms' MD&A disclosures are under-explored. This study fills the void and is among the first to provide initial evidence that MD&A similarity among industry peers is informative and is a desired financial disclosure characteristic. The findings also complement the prior literature on the similarity among financial statements based on the comparability of numbers (e.g., De Franco, Kothari, and Verdi 2011; Barth, Landsman, Lang, and Williams 2012; Hoitash, Kurt, and Verdi

2018; Brown, Ma, and Tucker 2019). In addition, this study extends the literature regarding forward-looking MD&A disclosures, being the first to my knowledge to investigate the textual similarity of forward-looking disclosures contained in MD&A. This study, therefore, sheds light on how and why textual similarity of financial disclosures matters.

Third, this study contributes to our knowledge of corporate peer effects by investigating the effects of participants of geographic industry clusters on voluntary corporate disclosure, specifically the content of MD&A disclosures. This study is among the first to offer evidence on the role of these interacted firms in affecting management decisions regarding MD&A disclosure, which bridges the gap between the literature on financial disclosure and the literature on participants of geographic industry clusters.

Finally, this study has practical implications and should be of interest to regulators and market participants who have ongoing demands for informative MD&A disclosure. The findings improve our understanding of how managers use their discretion to prepare MD&A disclosures. In addition, the enhanced understanding of determinants of MD&A similarity can help regulators and standard setters such as the SEC and FASB take more effective approaches to evaluate and improve MD&A disclosures. As MD&A similarity influences the usefulness and relevance of MD&A disclosure, market participants such as investors and analysts should be aware of its informativeness.

The remainder of this paper proceeds as follows. Chapter II reviews the related literature and provides the development of hypothesis. Chapter III describes the measures and research design. Chapter IV outlines the sample selection process. Chapter V presents the findings, and Chapter VI concludes.

CHAPTER II. RELATED LITERATURE AND HYPOTHESIS

2.1 **Related Literature**

Geographic location is recognized as one of the essential firm characteristics that have a substantial impact on firms' decisions (Pirinsky and Wang 2006; Kedia and Rajgopal 2011; John, Knyazeva, and Knyazeva 2011). A growing body of research explores the implication of geographic proximity on management decisions. For instance, Coval and Moskowitz (2001) point out that geographic proximity reduces the cost of obtaining information and provides access to private information. Malloy (2005) indicates that analysts located close to a firm have better first-hand information to access the firm. Uysal, Kedia, and Panchapagesan (2008) find geographic proximity is an information advantage that leads to better firm acquisition decisions. Kubick, Lockhart, Mills, and Robinson (2017) show that corporate taxpayers believe geographic proximity to IRS offices reduces information asymmetry and leads to higher tax avoidance. As suggested by prior literature, geographic proximity among firms strengthens their interactions through which interdependency increases, networks deepen, communication increases, and knowledge flows more readily (Rosenfeld 1997; Audretsch 2003; Bell and Zaheer 2007; Aldieri 2011).

More importantly, the emergence of industrial clusters (Porter 1998) such as California's Silicon Valley, the Napa Valley's wine production, and Hollywood's movie production as a type of geographic proximity is an ongoing trend. Geographic industry clusters create a broad geographic learning community, and nearby peers are the important resources (Porter 1998; Ganesan, Malter, and Rindfleisch 2005). This geographical concentration (Cicone and Hall 1997) of industry peer firms brings many positive externalities such as facilitating inter-organization connections (Porter 2000; Lai, Hsu, Lin, Chen, and Lin 2014; Geldes, Felzensztein, Turkina, and Durand 2015). Moreover, peer firms from geographic industry clusters are more interacted through

competition and cooperation and experience a spillover effect for knowledge and information (Tallman, Jenkins, Henry, and Pinch 2004). The prior literature documents that the inter-organization interactions and spillover effects among the participants of industry clusters affect these peer firms' decisions and strategies (Chandler, Hagström, and Sölvell 1999). However, relatively little attention has been given in the accounting research to the effects of these interacted industry peer firms on management decisions regarding financial disclosure such as the MD&A.

Management Discussion and Analysis (MD&A) disclosure is considered one of the most important sections of the financial report (Rogers and Grant 1997; Tavcar 1998; Barron, Kile, and O'Keefe 1999), which provide an opportunity to see a firm through the eyes of its management and play a pivotal role in providing qualitative information to the market participants (e.g., Muslu, Radhakrishnan, Subramanyam, and Lim 2015; Durnev and Mangen 2020). As part of a firm's disclosure package (Clarkson, Kao, and Richardson 1999), MD&A is required by the SEC. Regulation S-K mandates companies to provide MD&A in their 10-K filings as item 7.

Although the disclosure is mandatory, the content of MD&A disclosure is voluntary and discretionary. Managers can exercise judgment to provide their own interpretation and supplement qualitative information. For instance, predictive information included in MD&A is under the protection of safe harbor rules. Considering its voluntary nature and significant discretion, MD&A provides managers considerable variation in how it can be presented. For example, Li (2008) finds that firms provide less readable MD&A when there is negative earnings news. Davis and Tama-Sweet (2012) show that when there is bad news, managers tend to use more pessimistic language in the MD&A relative to earnings press releases, which may reduce negative market reaction to bad news.

More importantly, prior literature finds managers modify their MD&As to a lesser degree and MD&A has increased in length over time (Brown and Tucker 2011). Despite regulators' efforts to improve MD&A disclosures, the information content of MD&A has not seen major changes (Li 2010). The lack of changes raises concerns about the boilerplate and generic disclosures of the MD&A section (SEC 2003). And prior studies have provided evidence on the duplication and repetition of the disclosure (Cazier and Pfeiffer 2016; Li 2019).

Most recently, on January 30, 2020, the SEC proposed to promote principle-based MD&A disclosure to reduce duplication and tailor it to the registrant's business and circumstances.[1] By November 2020, the SEC adopted the amendments that intended to improve disclosure by facilitating thoughtful and meaningful discussion and analysis, discouraging repetition, and reducing compliance burdens. The changes will offer firms greater flexibility and judgment in providing MD&A disclosures. Therefore, it is important to deepen our understanding of the factors that influence how managers exercise discretion to prepare MD&As. This will contribute to the ongoing discussion and evaluation of the changes to MD&A disclosure and adds to the literature on the informative role of MD&A disclosure and its implications on financial markets (Bryan 1997; Feldman, Govindaraj, Livnat, and Segal 2010; Sun 2010; Mayew, Sethraman, and Venkatachaiam 2015).

To the best of my knowledge, the impact of interacted industry peer firms on management decisions regarding MD&A disclosure has not been studied. In this study, I explore the extent to which industry peers from the same geographic industry cluster affect MD&A disclosures among

[1] SEC Proposed Rule Release No. 33-10750, *Management's Discussion and Analysis, Selected Financial Data, and Supplementary Financial Information*.

them as well as whether MD&A similarity among industry peer firms is a desirable attribute of financial disclosure, representing better disclosure.

2.2 **Development of Hypothesis**

Considering the informativeness and spillover effect of MD&As, managers not only have incentives to learn from peer firms' MD&A disclosures but also make decisions relying on peer firms' MD&A disclosures (Durnev and Mangen 2020). By referring to peers' MD&As, managers can improve their understanding of underlying economics, identify and learn from peers' strategies, and be better informed about future opportunities. More importantly, as suggested by institutional theory, firms face institutional pressures on mimicking the action of peer firms and tend to adopt similar MD&A disclosures to peer firms by learning from peer firms to earn benefits such as credibility and legitimacy and avoid uncertainty (Meyer and Rowan 1977; DiMaggio and Powell 1983; Zucker 1987; Miner and Raghavan 1999; Lieberman and Asaba 2006). For instance, adopting similar MD&As can lower information processing costs and stimulate information transmission, which reduces information asymmetry. By delivering similar MD&A disclosures, managers can better justify their decisions and improve draft efficiency. And similar MD&A disclosures could increase the credibility and reliability of its information content in the eyes of its users and be familiar with stakeholders.

Building on the theory and as geographic industry clusters foster interactions and inter-dependence among its participants, facilitate the spillover effects, and stimulate learning opportunities, I posit that industry peer firms from the same geographic industry cluster affect management decisions of MD&A disclosure and converge their MD&As through interactions,

which leads to MD&A disclosure similarity among local industry peers. This leads to the main hypothesis:

H1: Managers issue similar MD&A disclosures to industry peer firms from the same geographic industry clusters.

CHAPTER III. RESEARCH DESIGN

3.1 Measure of MD&A Similarity

To test the hypothesis at the pair level, I adopt the Vector Space Model (VSM) (Salton, Wong, and Yang 1975) to measure MD&A similarity for firm-peer pairs, as inspired by prior literature (Hoberg and Phillips 2010; Brown and Tucker 2011; Peterson, Schmardebeck, and Wilks 2015). I first extract both item 7 (MD&A) and item 7a (Risk Factor Disclosure) from 10-K filings and analyze them together as the MD&A because many companies choose to disclose market risk in item 7.[2] After removing all tables and numbers from MD&As, I use Porter's algorithm to stem words in MD&A, which mitigates the influence of different forms and tenses.[3]

I next create a unique word list based on all words that appear in MD&As during the sample period and count the number of MD&As containing each unique word on the list. Any word that only appears in one MD&A over the sample period is deleted from the list as it is a likely misspelling or data error. This unique word list is the dictionary for comparing similarity among MD&As and play an essential role in capturing and identifying the information brought by the similarity.

[2] To parse out the MD&A section more precisely, I manually reviewed all MD&A disclosures after the extraction. And for the discussions are "incorporated by reference" or are incorporated in other parts of 10-K fillings, I collected them by hand if they are available.

[3] Alternatively, I apply lemmatization to a subsample, which does full morphological analysis to identify the lemma for each word. I obtain consistent results with this alternative method.

Given the unique word list, I use VSM to covert each MD&A into a vector. This vector is an n-dimensional Euclidean space, where n is the total number of unique words from all MD&As and the frequency of a unique word in an MD&A composes an element. Each unique word in this vector will be weighted by using TF-IDF weighting function, which multiplies the frequency of a unique word in an MD&A by the logarithm of the total number of MD&As over the number of MD&As containing that unique word. Each unique word is weighted less if it appears in more MD&As. Common words like "management" that appear in almost every MD&A receive little weight.

The angle between two vectors represents the similarity between two MD&As. For instance, ν_1 is the vector for MD&A 1 and ν_2 is the vector for MD&A 2. *n* represents the total number of unique words in each MD&A and both α and β count the frequency of each unique word in MD&A 1 and MD&A 2

$$\nu_1 = (\alpha_1, \alpha_2, \dots, \alpha_{n-1}, \alpha_n) \; and \; \nu_2 = (\beta_1, \beta_2, \dots, \beta_{n-1}, \beta_n)$$

Based on vector ν_1 and ν_2 and their lengths, $\cos(\theta)$ is calculated by using the equation as below and it is the MD&A similarity score.

$$MD\&A\ Similarity\ Score = \cos(\theta) = \frac{\nu_1}{\|\nu_1\|} \cdot \frac{\nu_2}{\|\nu_2\|} = \frac{\nu_1 \cdot \nu_2}{\|\nu_1\|\|\nu_2\|}$$

For the pair level analyses, firm *i*'s MD&A is compared with all two-digit SIC industry peers' MD&As. Each firm *i* and peer *j* comparison generates an MD&A similarity score. At the firm level, I measure year-over-year MD&A modification (Brown and Tucker 2011) by comparing the difference between firm *i*'s MD&A of the current year relative to the prior year. Appendix A provides examples illustrating the MD&A similarity measure.

3.2 **Measure of Industry Peers From Same Geographic Industry Clusters**

Following extant literature, I extract firms' historical location information from 10-Ks and define geographic industry cluster as Metropolitan Statistical Area (MSA). If firms from the same two-digit SIC industry are located in the same Metropolitan Statistical Area (MSA), these firms are identified as industry peers from the same geographic industry cluster; As the primary measure, *MSA_Same* is an indicator variable that is set equal to one if firm-peer pairs from same two-digit SIC industry are located in same geographic industry clusters, and zero if firm-peer pairs from same two-digit SIC industry are located in different geographic industry clusters.

3.3 **Empirical Model**

To examine whether managers issue similar MD&A disclosures to industry peer firms from the same geographic industry clusters (H1), I conduct pair level analyses and employ the ordinary least squares (OLS) regression model as below.

$$MD\&A\ Similarity_{ijt} = a + b_1\ Industry\ Cluster_{ijt} + Control\ variables. \quad (1)$$

Where $MD\&A\ Similarity_{ijt}$ is MD&A similarity between firm *i* and two-digit SIC industry peer *j* for year *t*, which is measured by *MD&A Similarity Score*. Higher values of *MD&A Similarity Score* signify that their MD&A disclosures are more similar to each other.

The variable of interest is $Industry\ Cluster_{ijt}$. I use *MSA_Same* as the primary proxy of $Industry\ Cluster_{ijt}$, which equals one if a firm and its industry peer are located in the same geographic industry cluster, zero otherwise. A positive coefficient on $Industry\ Cluster_{ijt}$ would support the main hypothesis that firms adopt similar MD&As to industry peers located in the same geographic industry clusters.

Following prior literature with pair level analyses (De Franco et al. 2011), I include control variables to capture the difference in underlying firm economics and characteristics, which are expected to influence MD&A disclosure. They are absolute differences in firm size (*Size_Diff*), firm age (*Age_Diff*), leverage (*Lev_Diff*), market-to-book ratio (*BM_Diff*), return on assets (*ROA_Diff*), short-term debt (*Shortdebt_Diff*), operating cash flows (*CFO_Diff*), and minimum value in firm size (*Size_Min*), firm age (*Age_Min*), leverage (*Lev_Min*), book-to-market ratio (*BM_Min*), return on assets (*ROA_Min*), short-term debt (*Shortdebt_Min*), operating cash flows (*CFO_Min*). For instance, I control for economic similarity by including variables of the difference in return on assets and book-to-market ratio between firm *i* and its peer *j*. Some of these variables, such as short-term debt, are also presumably related to managers' incentives to modify MD&A disclosure. In addition, given the variation in the length of MD&As issued by different firms, I further add *Length_Diff* and *Length_Min* to control for the difference in MD&A length. All the regression analyses include industry fixed effects, year fixed effects, and MSA fixed effects, and the standard errors are clustered at the firm level.

CHAPTER IV. SAMPLE SELECTION

I start with firm years available in Compustat and CRSP. Analyst forecast data are obtained from I/B/E/S, and director information is obtained from BoardEx. The sample covers the period from 2003 to 2018. From 2003, all firms issue MD&A based on the new guidance released by the SEC in 2002, and most firms file annual reports on EGDAR in HTML. Because this study involves a substantial amount of hand collection of 10-K information and linguistic analysis, I choose this period to avoid differences created by various disclosure formats and the extraction process.

All 10-K filings are collected through EDGAR. I use Python to extract MD&A disclosures from 10-K filings and obtain firms' historical locations from the headers of 10-K filings.[4] Firms without valid MD&A and historical location information are removed. Additionally, I exclude firm-years with less than one million total assets, stock price less than one dollar, and firm-years with a fiscal year-end change. Each firm is required to have at least one two-digit SIC peer firm located in the same MSA and one peer firm located in the different MSA. The sample includes all pairs from the same two-digit SIC industries. All continuous variables are winsorized at 1% and 99% to mitigate the influence of outliers. The final sample includes over six million firm-peer-year observations.

CHAPTER V. RESULTS

Table 1 tabulates the descriptive statistics of the main variables. Final sample contains 6,366,258 firm-pairs from 5,747 unique firms between 2003 and 2018. The mean of *MD&A Similarity Score* is 0.1768. Higher scores indicate that firm-peer pairs adopt more similar MD&A disclosures. Geographic industry clusters consist of 126 MSAs. Ten percent of firm pairs are located in the same MSAs.

Table 2 presents the trend of variables of interest over the sample period from 2003 to 2018. I present the percentage of firm pairs located in the same MSAs and the mean MDA similarity score by year. The patterns indicate an increase of MD&A similarity after the SEC issued the guidelines regarding MD&A disclosure in 2002. One interesting takeaway is that I observe a jump

[4] Compustat only reports the current locations of firms' headquarters but companies change their headquarters locations (Pirinsky and Wang 2006). To address this issue, I obtain historical records of firms' locations from 10-K filings in order to conduct relocation tests.

of MD&A similarity during 2007-2008, following the financial crisis, and after that, MD&A similarity decreases. I also present the trend of MD&A similarity in Figure 1.

Table 3 presents the results of bivariate analyses for MD&A similarity at the firm level. Panel A shows that within geographic industry clusters, firms issue more similar MD&A disclosure to local two-digit SIC industry peers than those from different industries. The results help to validate my measure of MD&A similarity. Also, the finding suggests that the MD&A similarity among the participants of geographic industry clusters is not driven by other common attributes among firms. For instance, firms from the same city are likely to use a set of words such as the name of the city that firms in other areas would not use. More importantly, for the comparisons within industries, MD&A similarity scores (Panel B) for two-digit SIC industry peers from the same geographic industry clusters are significantly higher than those from different clusters. This provides preliminary evidence supporting the main hypothesis.

5.1 **MD&A Similarity Among Local Industry Peers**

Table 4 presents the results of the primary test for the main hypothesis by using the regression model in Equation (1), where the dependent variable is *MD&A Similarity Score*. The main variable of interest is *MSA_Same*, and its coefficient is estimated to be positive. Consistent with prediction, the results show the coefficients on *MSA_Same* are positive and highly statistically significant. This provides evidence that industry peer firms are more likely to issue similar MD&As when they are located in the same geographic industry cluster and suggests that industry peers from the same industry cluster affect management decisions of MD&A disclosure. In terms of control variables, the coefficients are as expected. The result shows that the difference in firm characteristics such as size, leverage, and firm age is associated with the variation of MD&A

similarity among industry peer firms. The variation of economic similarity among peer firms proxied by the difference in book to market ratio and return on assets also affects MD&A similarity. And as suggested by prior literature, shared auditors increase MD&A similarity among industry peer firms (De Franco, Fogel-Yaari, and Li 2020), and it is necessary to control for MD&A length as a disclosure characteristic.

5.2 **Cross-Sectional Analyses**

To further understand MD&A similarity among peer firms from the same geographic industry cluster, I next conduct cross-sectional analyses of the factors that moderate the effect of these interacted peer firms on management decisions of MD&A disclosure by adopting the fully-interacted models.[5]

5.2.1 **Social Networks**

Networks are vital for emerging and existing geographic industry clusters (Breschi and Malerba 2001; Lai, Hsu, Lin, Chen, and Lin 2013; Porter 1998). As industry peers are congregated in a geographic cluster, more and better networks are established among them. These networks provide critical access to peer firms' information and enhance efficiency and effectiveness of inter-firm information diffusion and knowledge spillover (e.g., Galaskiewicz and Wasserman 1989; Kraatz 1998; Yli-Renko, Autio, and Sapienza 2001). The sociology literature suggests social interactions influence economic behavior and shows social networks affect economic agents' decisions (e.g., Haunschild 1994; Gulati and Gargiulo 1999; Mizruchi and Stearns 2001). With regard to peer firms from the same geographic industrial cluster, I expect social networks among

[5] The introduction of the interaction with the term of interest could create additional correlated omitted variable concerns. See Swanquist and Whited (2018)

them can facilitate their interactions and amplify the effect of these peer firms on management decisions regarding MD&A disclosure by association.

To examine the role of social networks, I measure the social networks among peer firms in several ways. First, directors who serve on multiple boards have access to peer firms' information and facilitate inter-firm information flow, and interlocking boards influence peer firms' behaviors (Mol 2001; Renneboog and Zhao 2014; Omer, Shelley, and Tice 2020). So, I create the first indicator variable, *Director_Same,* for industry peer firms with interlocked boards, which equals one if firm *i* and industry peer *j* have directors in common currently.[6] Also, audit firms as economic agents play an important role in shaping corporate decisions regarding financial disclosure. Although audit firms do not audit MD&A disclosures, they do have the responsibility to review them. As each audit firm has its unique audit style and follows its specific internal rules for implementing standards (Francis, Pinnuck, and Watanable 2014), firms may refer to peer firms served by the same audit firm office to prepare MD&A disclosures. Auditors also could mediate peer firms' information by suggesting the adoption of MD&A disclosure standards used by local peers. So, I create the second measure of social networks, *Audit_Same*, which indicates that peer firms are served by the same audit firm. Similarly, the third measure, *Investor_Same*, is an indicator variable for firms with the same institutional investors. With the monitoring role of institutional investors (Hartzell and Starks 2003), how a firm prepares its own MD&A disclosure may draw more attention from the peer firms with the same institutional investors.

Besides measuring social networks at the firm level, I adopt the social capital index developed by Rupasingha, Goetz, and Freshwater (2006) to proxy local social networks.[7] As a

[6] Firm *i* and peer *j* have at least one director in common. See Renneboog and Zhao 2014.

[7] Since the original data is collected at county-level and is only available for 1997, 2005, 2009, and 2014, I measure the social capital at the MSA level using the mean value of the social capital index of all counties within the MSA and use linear interpolation to create the data for the intervening years.

widely-used social capital index (e.g., Wojan, Lambert, McGranahan 2007; Hopkins 2010; Malecki 2012; Berglund and Kang 2013; Hasan, Hoi, Wu, and Zhang 2017; Hsieh, Kim, Wang, and Wang 2020), it is constructed as the first principal component of four factors: the percentage of voters who voted in the presidential election, the county-level response rate to the Census Bureau's decennial census, the number of tax-exempt non-profit organizations, and the aggregate number of establishments like business associations, labor organizations, and professional organizations. If an MSA has the higher social capital, it is identified as an area with strong local social networks.

Table 5 presents the results that pertain to the argument regarding the role of social networks in facilitating the impact of peer firms from the same industry cluster on management decisions regarding MD&A, where the measures of social network are: *Director_Same*, *Audit_Same*, *Investor_Same*, and *Social_Capital*. Higher values indicate stronger social networks among industry peer firms. The variable of interest is the interactions between *MSA_Same* and the measures of social networks and the coefficients on the interactions are predicted to be positive. The results show the coefficients of the interactions are positive and significant, which provide evidence on the role of social networks in facilitating MD&A similarity among industry peers from the same geographic industry. The findings are consistent with the view that social networks improve inter-organization interactions and work as a channel that enhances the impact of peer firms from the same geographic industry on management decisions regarding MD&A disclosure, which offer additional support for the main hypothesis.

5.2.2 **Uncertainty**

Institutional theory suggests that uncertainty is one of the main forces that drive imitation. When a market is highly unpredictable and variable, it is more challenging for management to anticipate future events and circumstances, describe current environments, and make related decisions. And, at the same time, firms face more pressure and need to justify and defend their judgments and choices under uncertainty. So, uncertainties intensify the management incentives to study how peer firms perceive and respond to the uncertainties, such as making inferences about the impact of the unstable market environment, and then model itself after these industry peers. In terms of MD&A disclosure, as suggested by institutional theory that adopting similar disclosure to peer firms can increase its credibility and legitimacy, I expect managers are more likely to adopt similar to local industry peers through learning when uncertainty is high. In other words, uncertainty will moderate the influence of interacted peer firms on management decisions regarding MD&A disclosure.

I examine the moderate role of uncertainty in Table 6, where uncertainty is measured at the industry level. I proxy uncertainty in two ways: the industry mean standard deviation of firms' revenue over the past 16 quarters, *Earnings Volatility*, and the industry mean standard deviation of firms' earnings over the past 16 quarters, *Revenues Volatility*. Higher values indicate greater market uncertainty. In Panel A and B, the results consistently show that MD&A similarity among local industry peers is more pronounced when they are from highly uncertain industries, which suggests that uncertainty amplifies management incentives to adopt similar MD&A disclosures to local industry peers and is consistent with the expectation based on institutional theory.

5.2.3 **Competition**

The clusters enhance the depth and breadth of interactions among co-located industry peers. On the one hand, the interactions facilitate the knowledge acquisition and information flow and induce cooperation and networks that generate competitive advantages for its participants (McCormick 1999; Tallman, Jenkins, Henry, and Pinch 2004; Niu 2010). On the other hand, as stated by the theories of industrial clusters, the interactions also bring competition among firms within clusters, besides cooperative relationships (Newlands 2003). These interactions imply a tradeoff between convergence and distinguishment faced by managers of these interacted firms. Signaling theory (Connelly, Certo, Ireland, and Reutzel 2011) suggests that firms tend to voluntarily disclose unique information to distinguish themselves from their competitors. The mounting pressure of competition may amplify managers' incentive to distinguish themselves from local peer firms by providing dissimilar MD&As. So, I predict that MD&A similarity between a firm and its peers from the same geographic industry cluster will be lower when the market is competitive. In other words, industry peer firms from the same geographic clusters become less likely to converge their MD&A disclosures when competitive intensity is high.

Table 7 displays the related results, where *Competition* is measured by the Herfindahl index and four-firm concentration ratio as defined in Appendix C, and both indexes are multiplied by negative one. The key variable of interest, *MSA_Same*Competition*, is significantly negative. The negative sign on *MSA_Same*Competition* indicates that co-located industry peer firms issue less similar MD&A disclosures when competition is higher. The finding suggests that under the stress of competition and given the management incentive to distinguish from competitors, industry peer firms from the same geographic cluster tend to issue more dissimilar MD&A disclosures.

5.2.4 **Young Firms and Centralized Firms**

In this section, I consider the firms in which management decisions regarding MD&A disclosure are more likely to be affected by the interacted peer firms from the same industry cluster. As discussed above, the literature on institutional theory suggests firms follow and refer to peer firms to gain benefits such as credibility and legitimacy (e.g., Meyer and Rowan 1977; DiMaggio and Powell 1983). I expect that as relatively less known and reputable firms, young firms have more incentives to learn from local peer firms' MD&As and adopt similar MD&As from co-location industry peers to obtain these benefits. Moreover, as centralized firms usually focus on fewer markets and are less geographically distributed, they are expected to be more likely to interact with local peer firms, pay attention to the disclosures of local peer firms, and be affected by peer firms' disclosure strategies. Therefore, I examine whether MD&A similarity among peer firms from the same industry cluster will be more pronounced for young firms and centralized firms.

Table 8 presents the regression results. In Panel A, I identify young firms as firms with age less than the industry median value of the current year. *Young* is equal to one if either firm *i* or peer *j* is a young firm, zero otherwise; For pairs that both are young firms, they are removed from the sample. The result shows the coefficients of the interaction, *Young*MSA_Same, are* significantly positive, consistent with the expectation that as young firms are relatively unknown, short of credibility, and unfamiliar for third parties, managers of young firms have more incentives to adopt similar disclosure to local industry peers. The result for centralized firms is presented in Panel B, where centralized firms are defined as following Garrett et al. (2014). Specifically, I proxy centralized firms by using the average of the three ranked variables multiplied by negative one: the number of geographic segments, the number of business segments, and the number of employees. As higher values indicate that firms have more centralized, I identify centralized firms

as firms with the value higher than the industry median value of the current year. *Central* is equal to one if either firm *i* or peer *j* is a centralized firm, zero otherwise; The variable of interest, *Central *MSA_Same,* is significantly positive, which suggests that centralized firms are more likely to be affected by local peer firms and converge their MD&A disclosures.

5.2.5 **Leading Firms and Mature Firms**

In contrast to young firms and centralized firms, I expect that leading firms and mature firms are less likely to be affected by local industry peer firms to adopt similar MD&A disclosures. They are established and well-known companies that are lack of incentives to mimic local peer firms' actions and are less likely to pay attention to the MD&A disclosures issued by local peers. So, to explore the firms in which management decisions regarding MD&A may be less likely to be affected by peer firms from the same industry clusters, I examine MD&A similarity among local industry peers for leading firms and mature firms.

Following prior literature, I define leading firms as firms from the S&P 500 lists. The S&P is a well-known and widely followed index. When firms are added to the index, firms are certified by S&P as a leading firm in accordance with the guiding principle for including firms in the S&P 500 (Cai 2007; Hrazdil 2010). For each pair, if either firm *i* or two-digit SIC industry peer *j* is a leading firm, *Lead* is equal to one and zero otherwise; For pairs that both are leading firms, they are removed from the sample. For mature firms, I identify them as firms at the mature stage of the life cycle (Dickinson 2011). *Mature* is equal to one if either firm *i* or peer *j* is a mature firm and zero otherwise.

Table 9 presents the related results. I find that the coefficients of both the interactions, *MSA_Same*Lead and MSA_Same*Mature*, are nonsignificant in Panel A and B, respectively. The

results are consistent with the expectation that how leading firms and mature firms prepare MD&A disclosures are less likely to be affected by local industry peers.

5.2.6 **Loss Firms and Firms Having a Negative Earnings Surprise**

Similar MD&A disclosures can facilitate comparisons of similarities and differences among peer firms and enable users to further understand and identify firms' underlying economics, operation, and strategies, which increases information availability. With managers have more incentive to obfuscate information when firm performance is bad (Bloomfield 2002; Li 2008), I expect that the loss firms and firms having a negative earnings surprise may be more likely to deliver dissimilar MD&A disclosures to peer firms from the same industry clusters.

I conduct the analyses to test the idea in Table 10. For each pair, if either firm *i* or two-digit SIC industry peer *j* is a loss firm, *Loss* is equal to one and zero otherwise; Similarly, *Miss* is equal to one if either firm *i* or peer *j* misses analyst forecasts and zero otherwise; Panel A and B show the results that suggests that firms are more likely issue dissimilar MD&A disclosures to local peers when they incur loss or miss analyst forecasts, which support the idea that managers obfuscate information by issuing dissimilar MD&A disclosures when firm performance is bad.

5.3 **Relocation Test**

In Table 11, I expend the analysis to investigate how firms' MD&A similarity changes after relocation. As firms' decisions regarding relocations are not likely to be driven by how they prepare their MD&A disclosures, the relocations serve as an exogenous shock and provide an ideal setting to further explore the causal effects of interacted peer firms on MD&A similarity. I expect that after relocations, relocating firms start to establish inter-organization connections and

interactions with peer firms located in new areas and converge their MD&A disclosures as a consequence.

I adopt a difference-in-differences model to examine how MD&A similarity of relocating firms changes after their relocations. As the treatment group, the relocating firms are required to have six-year data over the event window, where event year 0 is the relocation year.[8] During the sample period, they are relocated from one MSA to another MSA but cannot relocate more than one time and incur industry changes. If the relocations happened with mergers and acquisitions, they are eliminated (Engelberg, Ozoguz, and Wang 2018). For example, AppliedMicro relocated from San Diego to Sunnyvale in 2005 due to its acquisition. The control group is made up of relocating firms' two-digit SIC industry peers, which are located in new clusters or original clusters and did not incur relocations during the same period. I use the following equation to compare MD&As from relocating firms with their industry peers from the new MSAs and original MSAs, separately.

$$MD\&A\ similarity = a + b_1\ Treat + b_2\ Post + b_3\ Treat * Post + Control\ variables \qquad (2)$$

In this model, *Treat* is coded as one for relocating firms and zero for non-relocating peer firms located in new MSAs or original MSAs. And *Post* is an indicator variable for the post-relocation period. The variable of interest is the interaction between *Treat* and *Post*.[9] The control group is non-relocating peer firms located in new MSAs or original MSAs.

I report the results of examining the change of MD&A similarity after firms' relocations in Table 11. The coefficient of the interaction is significantly positive for new MSAs (Panel A)

[8] Both relocating firms and two-digit SIC industry peers from the same geographic clusters need to have valid MD&A disclosures for the seven-year event window (-3, +3) and year 0 is excluded from comparisons.
[9] The number of relocating firms that meet the criteria is 32.

and non-significant for original MSAs (Panel B). which indicates that MD&As of relocating firms become more similar to the industry peers located in new MSAs. The findings provide additional evidence that supports the main hypothesis and suggest that after firms are relocated to new geographic industry clusters, the interactions among relocating firms and new local industry peers are enhanced, which affects the management decisions and leads to convergence of MD&A disclosures.

5.4 **Forward-looking MD&A Disclosure**

Next, motivated by the SEC's emphasis and call on providing adequate and high-quality forward-looking disclosure in the MD&A, I further investigate the impact of industry peer firms from the same geographic industry cluster on forward-looking disclosure. Different from prior research studies the quantity and tone of forward-looking disclosure in the MD&A (e.g., Li 2010; Muslu, Radhakrishnan, Subramanyam, and Lim 2015; Cazier, Merkley, and Treu 2020), my focus is the textual similarity of forward-looking disclosures as a financial disclosure characteristic. Because of its future-oriented nature with predictive power (Tavcar 1998; Hussainey and Walker 2009; Durnev and Mangen 2020), forward-looking MD&A disclosures are more demanded and vital for market participants than disclosures describing past events (Muslu, Radhakrishnan, Subramanyam, and Lim 2011). As the disclosure of forward-looking information in MD&As is voluntary and under the safe harbor protection[10], this type of disclosure is left largely to the judgment and discretion of management and relatively short of repetitive, boilerplate, and compliance-oriented statements. Given that, to address the concern that MD&A similarity might be driven by repetitive sentences, standard statements or similar terms like city name, I modify

[10] The "safe harbor" under the Private Securities Litigation Reform Act of 1995 was established to encourage managers to provide MD&A forward-looking disclosure and minimize related litigation risks.

Equation (1) to examine whether co-located peer firms contain more similar forward-looking disclosures in their MD&As.

To construct similarity of forward-looking disclosure in MD&As among peer firms, I first parse each MD&A into sentences and then extract the sentences which include phrases that imply the future to form forward-looking MD&A disclosures as following Li (2010). The intensity of forward-looking MD&A disclosure over the sample period is around 12%, which is the number of forward-looking sentences divided by the total number of sentences in MD&A.[11] To ensure the quality and correction of extraction and formation, I select 1,000 representative MD&As and assign business students enrolled in upper-division undergraduate accounting classes to identify forward-looking sentences contained in these MD&As manually.[12] The untabulated comparisons validate the forward-looking disclosures extracted from MD&As. Appendix B describes the formation process of forward-looking disclosures in detail. Second, by adopting the same methodology described above, I create a unique word list for forward-looking disclosures and weigh each unique word with TD-IDF weighting. Finally, I use the VSM to generate forward-looking disclosure similarity scores by comparing forward-looking disclosures in MD&As of firm *i* and its two-digital industry peers for year *t*.

Figure 2 presents the trend of forward-looking MD&A disclosure similarity over the sample period. Surprisingly, the similarity increases for recent years, which is opposite to the decreasing trend of MD&A similarity. The interesting finding that emerges from Table 12 is that I find a significant positive coefficient on the *MSA_Same*, which indicates that for firm *i* and two-digit industry peer *j* from the same geographic industry clusters, they are likely to issue more

[11] This is consistent with the findings in prior literature. See Muslu, Radhakrishnan, Subramanyam, and Lim 2015.
[12] These MD&As are longest, shortest, latest, and earliest MD&As from random firm observations within the sample period.

similar forward-looking MD&A disclosures. The finding provides further evidence on the idea that industry peers from the same industry cluster affect how management exercises judgment and discretion in preparing MD&As and lead to the convergence of their MD&As.

5.5 **Underlying Economic Forces**

Operating in the same industry cluster naturally may create similar underlying economic forces. For example, peer firms from the same industry cluster may discuss the common economic condition they face in MD&As (e.g., current pandemic situation or the same market where they operate in). These underlying economic forces could be an alternative explanation of MD&A similarity among local peer firms. The analysis of forward-looking disclosure similarity among local peers in Table 12 alleviates the concern because forward-looking disclosure of MD&A is future-oriented and is less likely to contain information about current situations or discuss local environments.

To further address the concern of the implications of similar underlying economic forces, I conduct additional random subsample tests of forward-looking disclosure similarity among local industry peer firms in Table 13. In Panel A, by creating a list of names of all cities, counties, and states, I recalculate forward-looking disclosure similarity after removing all sentences that contain information about a specific geographic location. The untabulated results show relatively few forward-looking disclosures contain information about the economic condition of a specific location, which is consistent with the expectation. In Column 1, the result corroborates the finding in Table 12 and consistently suggest that co-located peer firms contain more similar forward-looking disclosures in their MD&As. As a comparison, I present the result with the original forward-looking disclosure similarity measure in Column 2.

Also, how industry peers prepare MD&A disclosures are likely to be affected by the economic events that happened within their industry or globally at the same time. For instance, the current global chip shortage. So, in Panel 2 and 3, I recreate the unique word dictionary of forward-looking disclosure by industry and year, respectively and remeasure forward-looking disclosure similarity using the new unique word dictionaries to mitigate these potential impacts. And the finding still holds (Column 1). Taken together, these results suggest that MD&A similarity among local peer firms is less likely driven by common practices or underlying economic forces and support my argument that peer firms from the same industry cluster affect how management exercises judgment and discretion in preparing MD&As.

5.6 **Economic Similarity**

Industry peers from the same geographic industry cluster are, to some degree, economically similar to each other. They may self-select to be a participant of industry clusters. For instance, high-tech businesses are clustered in Silicon Valley. These co-located industry peers are also likely to experience the same economic events and share similar firm characteristics such as business models. As an alternative explanation, the economic similarity may lead to MD&A similarity among local industry peers. Although I include the variables such as the difference in return on assets and book-to-market ratio in all tests to control for economic similarity among peer firms, they are probably unable to rule out this alternative explanation.

To further address this alternative explanation, I conduct a matched sample analysis based on economic similarity among firm peer pairs. Specifically, by using a Coarsened Exact Matching algorithm, I match each firm-peer pair from the same industry clusters with a pair from different industry clusters on economic similarity, industry, and year. The prior literature suggests that

accounting comparability among peer firms is largely determined by firms' economic similarities and driven by economic fundamentals (De Franco et al. 2011). Similar underlying economic events will be recorded similarly, and different production functions will be accounted for differently. Therefore, accounting comparability among peer firms can be the ideal proxy of their economic similarity and I proxy economic similarity among peer firms by using the measures developed in De Franco et al. (2011) and Barth et al. (2012).

The first proxy, *Economic Similarity1*, is estimated as the negative value of the average absolute difference between the two firms' predicted earnings using each firm's mapping functions from stock return to earnings for the past 16 quarters (De Franco et al. 2011). The models are listed as follows:

$$\mathrm{E}(Earnings)_{it} = \alpha + \beta_1 Return_{it} \quad (3)$$

$$Economic\ Similarity = -\frac{1}{16} \times \sum_{t=0}^{-15} |E(Earnings)_{iit} - E(Earnings)_{jit}| \quad (4)$$

Based on Barth et al. (2012), the second measure, *Economic Similarity2*, is estimated by using the following models:

$$\mathrm{E}(CF)_{it} = \alpha + \beta_1 NI_{it} \quad (5)$$

$$Economic\ Similarity = -\frac{1}{16} \times \sum_{t=0}^{-15} |E(CF)_{iit} - E(CF)_{jit}| \quad (6)$$

For both economic similarity measures, the higher *values* indicate higher economic similarity between two firms. Table 14 reports the results of the matched sample test. The main finding still holds with the matched sample, and the results consistently suggest that industry peer firms from the same geographic industry cluster are more likely to adopt similar MD&A disclosures.

Additionally, in Table 15, I repeat the analysis reported in Table 4 by including *Econ_Similarity1* and *Econ_Similarity2* as additional control variables. The result still holds after

further controlling for economic similarity among industry peer firms. Taken together, the results mitigate the concern about the implications of economic similarity among local industry peers.

5.7 **Alternative Measure of MD&A Similarity**

As shown in previous tables, MD&A similarity score among industry peers is sensitive to and associated with the difference in MD&A length. For example, when MD&As are longer, they are more likely to contain similar words from other MD&As, leading to greater similarity. Given large variations in the lengths of MD&As issued by different firms, I follow Brown and Tucker (2011) by employing the Taylor expansion at 0 and regress *MD&A Similarity Score* on the first five polynomials of the length of MD&A to estimate the functional relation between similarity score and MD&A length. Then, I construct the alternative measure of MD&A similarity, *MD&A Similarity Score 2,* as the difference between the actual similarity score and the expected similarity score given the MD&A length.

$$MD\&A\ Similarity\ Score\ 2 = MD\&A\ Similarity\ Score - \mathbb{E}(MD\&A\ Similarity\ Score)$$

Where $\mathbb{E}(.) = \alpha_0 + \beta_1 Length + \beta_2 Length^2 + \beta_3 Length^3 + \beta_4 Length^4 + \beta_5 Length^5$. The length is the logarithm of the number of words contained in an MD&A.

Table 16 presents the analysis with the alternative measure of MD&A similarity. The coefficient for *MSA_Same* continues to be positive and statistically significant, which corroborates the previous finding.

5.8 **Alternative Measure of Industry Peer Firms From Same Geographic Industry Clusters**

As social influence is heavily determined by physical distance (Bossard 1932; Zipf 1949; Latane, Liu, Nowak, Bonevento, and Zhang 1995), physical distance also functions as a proxy of

social ties (Mayhew and Levinger 1977) and informational closeness (Petersen and Rajan 2002). So, I construct the alternative measure of industry peer firms from the same geographic industry cluster by calculating the geographic distance between each pair of firms based on the latitude and longitude of their headquarters. The alternative measure, *Closeness*, is the logarithm of the distance in miles between the headquarters of each firm pair multiplied by negative one.

Table 17 tabulates the regression estimates for testing the main hypothesis with the alternative measure. The estimation results reported consistently support the main argument.

5.9 **Additional Analyses: The Implications of MD&A Similarity**

To supplement the main analyses, I examine the implications of MD&A similarity among industry peers as a financial disclosure characteristic. If industry peer firms issue similar MD&As with motivations such as confirming useful and reliable information and converging to effective and efficient routines, MD&A similarity among industry peers could be beneficial and desired for users such as lower information processing costs, stimulate information transmission, and promote users' gathering and understanding of firm-related information.

First, I examine the association between the MD&A similarity and MD&A year-over-year modification. If MD&A similarity among peer firms is driven by inter-firm interactions such as information sharing and knowledge exchange rather than compliance-oriented and repetitive statements, I expect that for firms issue similar MD&As to industry peers, they are more likely to modify their MD&As year over year. In other words, MD&A similarity is expected to be positively associated with MD&A year-over-year modification.

In addition, analysts usually are experts in certain industries and are familiar with common practices within industries (Kadan, Madureira, Wang, and Zach 2012). Like individual investors,

they rely on public disclosures (Rogers and Grant 1997; Kross and Suk 2011). When MD&A disclosures deviates among industry peers or from industry norms, it may create difficulties for analysts to verify or digest their information contents. Therefore, MD&A similarity among industry peers could be desired by users such as analysts. Given that, I next examine whether similar MD&A disclosures lead to higher analyst coverage, less forecast dispersion, and more accurate forecast.

To explore the implications of MD&A similarity among industry peers. I construct the firm-level MD&A similarity score, *MD&A Similarity,* as the median MD&A similarity score for firm *i* for all peer firms from firm *i*'s industry for year *t*. I create the measures of MD&A year-over-year modification based on Brown and Tucker (2011). And I employ the widely used measures: the number of analysts following (*Coverage*), analyst dispersion in earnings expectations (*Dispersion*), and forecast error (*Accuracy*) for year *t+1*, which are calculated following prior literature (e.g., De Franco et al. 2011).

I adopt the following model to examine the impact of MD&A similarity among industry peers at the firm level, where *Impact* will be: (1) MD&A modification, (2) analyst coverage, (3) forecast dispersion, and (4) analyst forecast accuracy. The variable of interest is $MD\&A\ Similarity_{it}$

$$Impact_{t+1} = a + b_1\ MD\&A\ Similarity_{it} + Control\ variables. \quad (7)$$

5.9.1 **MD&A Similarity and MD&A Modification**

I provide an empirical analysis of the association between MD&A similarity and MD&A modification in Table 18. The dependent variables are MD&A modification for year *t* in Columns 1 and 2 and MD&A modification for year *t+1* in Columns 3 and 4, where MD&A modification is measured by following Brown and Tucker (2011). Specifically, the year-over-year MD&A

modification is proxied by *MD&A Modification* and *MD&A Modification Raw*. The coefficient of the key variable of interest, *MD&A Similarity*, is expected to be positive and significant. The regression results of estimating Equation (7) show that a firm's current-year MD&A similarity among industry peers is positively associated with its current-year modification of MD&A, and firms with high MD&A similarity are more likely to modify their MD&As in the future. The findings imply that firms converge MD&A disclosures through modification rather than by using repetitive statements or boilerplate language.

5.9.2 **MD&A Similarity and Analyst**

Table 19 represents the results of examining the impact of MD&A similarity among industry peers on analysts. As expected, the results show that firms with higher MD&A similarity with industry peers have more analyst coverage (Column 1), less forecast dispersion (Column 2), and greater forecast accuracy (Column 3). Overall, these findings provide initial evidence that MD&A similarity among industry peer firms is informative and a desired attribute of MD&A disclosure.

5.10 **Other Robustness Tests**

I conduct several additional robustness tests to examine the sensitivity of the main results. Instead of using MSAs as the primary measure of geographic industry clusters, I use counties as an alternative proxy. The untabulated results are consistent with the main results. With the alternative definition of industry peer, I examine MD&A similarity among three-digit SIC industry peers (De Franco, Fogel-Yaari, and Li 2020). The untabulated results remain similar to the main results.

CHAPTER VI. CONCLUSIONS

Prior literature documents the importance of MD&A as financial disclosure and its implications. With its flexible format and voluntary nature, managers can exercise great judgments in providing their own interpretation and have the discretion to use their own words to supplement qualitative information, which enables us to see a company through the eyes of management. Although standard setters and regulators have a longstanding interest in improving and strengthening MD&A disclosure, recent literature throws doubt about the usefulness of MD&A. Given the concerns and ongoing discussion about the informativeness and relevance of MD&A disclosure, this study further our knowledge about how managers prepare MD&A disclosures by exploring how interacted peer firms affect management decisions regarding MD&A disclosure.

By using over 6 million firm-peer pair observations between 2003 and 2018, I examine and find that firms adopt similar MD&A disclosures with industry peer firms from the same geographic industry clusters, which suggests the convergence of MD&A disclosure among these interacted industry peers. Further analyses identify social networks and market environments as factors that moderate the impact of peer firms from the same industry cluster. And I also observe that MD&A similarity among local industry peers varies among different types of firms. Furthermore, the relocation and forward-looking MD&A disclosure analyses provide additional evidence on the impact of peer firms from the same industry cluster on individual firm's MD&A disclosure. The findings support the idea that the interacted peer firms affect management decisions regarding MD&A disclosure.

Finally, I provide the analyses to examine the implications of MD&A similarity among industry peers. First, I find that firms with similar MD&A disclosures are more likely to modify MD&A, which suggests that firms converge their MD&A disclosures through modification. Next,

the results show that MD&A similarity among industry peers leads to more analyst coverage, less forecast dispersion, and greater forecast accuracy. The findings provide preliminary evidence that MD&A similarity is informative and is a desired attribute of MD&A disclosure, which elaborate the importance of exploring MD&A similarity among industry peer firms.

I acknowledge the potential limitations of this study. Due to the nature of my construct of MD&A similarity, I do not address questions regarding which specific elements of MD&A contribute to this similarity, nor do I assess the optimal level of MD&A similarity. Future research could further examine these questions by characterizing the similar and dissimilar parts of MD&A disclosures.

Collectively, this study makes contributions in several ways. It contributes to the literature on voluntary disclosure by advancing our understanding regarding how managers prepare MD&A disclosures. The findings suggest interreacted industry peer firms from the same industry cluster affect management decisions regarding MD&A disclosure. Additionally, it extends the literature on MD&A textual features by exploring the textual similarity among industry peers' disclosures and its implications. Also, it broadens our knowledge about peer firm effects by providing new insights on the impact of participants of geographic industry clusters. This study responds to ongoing desires and discussions for the usefulness and enhancement of MD&A disclosure and has practical implications.

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APPENDIX A
MD&A Similarity Example

Example 1. MD&A Similarity Over Time

The following is a comparison of similarities between a firm's MD&A disclosure in year *t* and year *t-1*, which illustrates the advantages of MD&A similarity measures adopted by this study over plagiarism software. The differences between two MD&A disclosures are highlighted in red.

Similarity score: 95% **Plagiarism software: 78%**	
Fiscal year end: December 31, 2011	Fiscal year end: December 31, 2012
ITEM 7. MANAGEMENTS DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION. Results of Operations We have two product lines. The first is a chemical (EWCP) used in swimming pools and spas. The product forms a thin, transparent layer on the waters surface. The transparent layer slows the evaporation of water, allowing the water to retain a higher temperature for a longer period of time thereby reducing the energy required to maintain the desired temperature of the water. A modified version of EWCP can also be used in reservoirs, potable water storage tanks, livestock watering pods, canals, and irrigation ditches for the purpose of reducing evaporation. The second product, biodegradable polymers (TPAs), is used by the petroleum, chemical, utility and mining industries to prevent corrosion and scaling in water piping. TPAs can also be used to increase biodegradability in detergents and in the agriculture industry to increase crop yields by enhancing fertilizer uptake. Our US subsidiary, Nanochem Solutions, Inc has normally generated income and paid income taxes on its profits. However, our Canadian subsidiary, Flexible Solutions Ltd., normally generates losses. The losses of our Canadian subsidiary cannot be used to reduce any taxes payable by our US subsidiary. As a result, and since for financial reporting purposes the operating results of the US and Canadian subsidiaries are consolidated, the income tax expense (benefit) shown in our statements of operations reflects the combine income tax (benefit) of the subsidiaries. Material changes in our Statement of Operations for the periods presented are discussed below: Year Ended December 31, 2011 Item Increase (I) or Decrease (D) Reason Sales EWCP TPAs I I Increase in customers inventories to more normal levels. Increased sales across all markets due to increased success in marketing. Wages Administrative salaries and benefits I I Annual wage increases as well as grant of five year stock options to key employees. Annual wage increases as well as grant of five year stock options granted in 2011 to key employees. Consulting Professional fees Income Tax I I I Increase in sales. Legal costs to protect the Companys intellectual property have increased due to new patent filings and some litigation costs. Net income in the United States cannot be offset by losses in foreign jurisdictions. 14 Capital Resources and Liquidity Our material sources and of cash during the year ended December 31, 2011 were: Cash provided by operations $ (798,800) Equipment purchases, primarily related to our new facility in Alberta, Canada (794,848) Borrowing from short term line of credit 650,000 Repayment of loans (309,056) Repurchase of common stock (1,030,349) Exchange rate changes 26,536 Our material sources and of cash during the year ended December 31, 2010 were: Cash provided by operations $ 1,319,151 Equipment purchases, primarily related to our new facility in Alberta, Canada (613,902) Repayment of loans (82,995) Exchange rate changes 15,016 In 2007, we began construction of a plant in Taber Alberta. The plant will be used to manufacture aspartic acid which is the major component of TPAs. Presently we buy aspartic acid from China where the base raw material is oil. Our plant in Taber will use sugar as the base raw material. Although we expect that we will still import some aspartic acid from China, using aspartic acid manufactured by our plant from sugar will reduce our raw material costs, reduce price fluctuations generated by oil prices and reduce shipping costs. We have sufficient cash resources to meets our future commitments and cash flow requirements for the coming year. As of December 31, 2011, our working capital was $3,601,122 and we have no substantial commitments that require significant outlays of cash over the coming fiscal year. We are committed to minimum rental payments for property and premises aggregating approximately $278,636 over the term of three leases, the last expiring on July 31, 2014. 15 Commitments in each of the next five years are as follows: Other than as disclosed above, we do not anticipate any capital requirements for the twelve months ending December 31, 2012. Other than as disclosed in this report, we do not know of any trends, demands, commitments, events or uncertainties that will result in, or that are reasonable likely to result in, our liquidity increasing or decreasing in any material way. Other than as disclosed in this report, we do not know of any significant changes in our expected sources and uses of cash. We do not have any commitments or arrangements from any person to provide us with any equity capital. See Note 2 to the financial statements included as part of this report for a description of our significant accounting policies. Critical Accounting Policies And Estimates Allowances for Product Returns. We grant certain of our customers the right to return product which they are unable to sell. Upon sale, we evaluate the need to record a provision for product returns based on our historical experience, economic trends and changes in customer demand. Allowances for Doubtful Accounts Receivable. We evaluate our accounts receivable to determine if they will ultimately be collected. This evaluation includes significant judgments and estimates, including an analysis of receivables aging and a review of large accounts. If, for example, the financial condition of a customer deteriorates resulting in an impairment of its ability to pay or a pattern of late payment develops, an allowance may be required. Provisions for Inventory Obsolescence. We may need to record a provision for estimated obsolescence and shrinkage of inventory. Our estimates would consider the cost of inventory, the estimated market value, the shelf life of the inventory and our historical experience. If there are changes to these estimates, provisions for inventory obsolescence may be necessary. Recent Accounting Pronouncements We have evaluated recent accounting pronouncements issued since January 1, 2011 and determined that the adoption of this recent accounting pronouncements will not have a material effect on our financial statements. 16 ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK. Not applicable.	ITEM 7. MANAGEMENTS DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION. Results of Operations We have two product lines. The first is a chemical (EWCP) used in swimming pools and spas. The product forms a thin, transparent layer on the waters surface. The transparent layer slows the evaporation of water, allowing the water to retain a higher temperature for a longer period of time thereby reducing the energy required to maintain the desired temperature of the water. A modified version of EWCP can also be used in reservoirs, potable water storage tanks, livestock watering pods, canals, and irrigation ditches for the purpose of reducing evaporation. The second product, biodegradable polymers (TPAs), is used by the petroleum, chemical, utility and mining industries to prevent corrosion and scaling in water piping. TPAs can also be used to increase biodegradability in detergents and in the agriculture industry to increase crop yields by enhancing fertilizer uptake. Our US subsidiaries have normally generated income and paid income taxes on its profits. However, our Canadian subsidiaries normally generate losses. The losses of our Canadian subsidiary cannot be used to reduce any taxes payable by our US subsidiaries. As a result, and since for financial reporting purposes the operating results of the US and Canadian subsidiaries are consolidated, the income tax expense (benefit) shown in our statements of operations reflects the combine income tax (benefit) of the subsidiaries. Material changes in our Statement of Operations for the periods presented are discussed below: Year Ended December 31, 2012 Item Increase (I) or Decrease (D) Reason Sales EWCP products D Increased orders in the previous periods contributed to decreased orders in this period. BPCA products I Increased sales across all **market verticals** due to increased success in sales activity. Gross Profit, as a % of sales D Start of production at Taber plant increased depreciation; high oil prices increased aspartic acid costs. Wages D Normal employee attrition replaced by temporary workers. Administrative salaries and benefits I Increased sales. Insurance I Increased sales. Consulting I Temporary workers were used to replace normal employee attrition. Professional fess I Legal costs to protect our intellectual property have increased due to new patent filings and cost of arbitration proceeding. Commissions I Increased sales for the period resulted in higher commissions. 14 Capital Resources and Liquidity Our material sources and of cash during the year ended December 31, 2012 were: Cash used by operations $ (305,840) Equipment purchases, primarily related to our new facility in Alberta, Canada (96,721) Borrowing from short term line of credit 555,000 Repayment of loans (293,397) Exchange rate changes (4,078) Cash on hand at beginning of period 145,036 Our material sources and of cash during the year ended December 31, 2011 were: Cash used by operations $ (798,800) Equipment purchases, primarily related to our new facility in Alberta, Canada (794,848) Borrowing from short term line of credit 650,000 Repayment of loans (309,056) Repurchase of common stock (1,030,349) Exchange rate changes 26,536 Cash on hand at beginning of period 2,256,517 In 2007, we began construction of a plant in Taber Alberta. The plant is being used to manufacture aspartic acid which is the major component of TPAs. Previously, we bought aspartic acid from China where the base raw material is oil. Our plant in Taber uses sugar as the base raw material. Although we expect that we will still import some aspartic acid from China, using aspartic acid manufactured by our plant from sugar will reduce our raw material costs, reduce price fluctuations generated by oil prices and reduce shipping costs. We have sufficient cash resources to meets our future commitments and cash flow requirements for the coming year. As of December 31, 2012, our working capital was $3,489,827 and we have no substantial commitments that require significant outlays of cash over the coming fiscal year. We are committed to minimum rental payments for property and premises aggregating approximately $203,259 over the term of two leases, the last expiring on July 31, 2014. Commitments in each of the next five years are as follows: Other than as disclosed above, we do not anticipate any material capital requirements for the twelve months ending December 31, 2013. Other than as disclosed in this report, we do not know of any trends, demands, commitments, events or uncertainties that will result in, or that are reasonable likely to result in, our liquidity increasing or decreasing in any material way. Other than as disclosed in this report, we do not know of any significant changes in our expected sources and uses of cash. We do not have any commitments or arrangements from any person to provide us with any equity capital. See Note 2 to the financial statements included as part of this report for a description of our significant accounting policies. 15 Critical Accounting Policies And Estimates Allowances for Product Returns. We grant certain of our customers the right to return product which they are unable to sell. Upon sale, we evaluate the need to record a provision for product returns based on our historical experience, economic trends and changes in customer demand. Allowances for Doubtful Accounts Receivable. We evaluate our accounts receivable to determine if they will ultimately be collected. This evaluation includes significant judgments and estimates, including an analysis of receivables aging and a review of large accounts. If, for example, the financial condition of a customer deteriorates resulting in an impairment of its ability to pay or a pattern of late payment develops, an allowance may be required. Provisions for Inventory Obsolescence. We may need to record a provision for estimated obsolescence and shrinkage of inventory. Our estimates would consider the cost of inventory, the estimated market value, the shelf life of the inventory and our historical experience. If there are changes to these estimates, provisions for inventory obsolescence may be necessary. Recent Accounting Pronouncements We have evaluated recent accounting pronouncements issued since January 1, 2012 and determined that the adoption of this recent accounting pronouncements will not have a material effect on our financial statements. ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK. Not applicable.

Example 2. MD&A Similarity Among Industry Peers

The following is an example of similarities between industry peers' MD&A disclosures, which contains two paragraphs from MD&A disclosures issued by firm *i* and peer *j* in year t.

In December 2019, a novel strain of coronavirus was reported in Wuhan, China. The World Health Organization has declared the outbreak to constitute a "Public Health Emergency of International Concern." The COVID-19 outbreak is disrupting supply chains and affecting production and sales across a range of industries. The extent of the impact of COVID-19 on our operational and financial performance will depend on certain developments, including the duration and spread of the outbreak, impact on our customers, employees and vendors all of which are uncertain and cannot be predicted. At this point, the extent to which COVID-19 may impact our financial condition or results of operations is uncertain.	In December 2019, a novel strain of coronavirus was reported in Wuhan, China. The World Health Organization has declared the outbreak to constitute a "Public Health Emergency of International Concern." The COVID-19 outbreak is disrupting supply chains and affecting production and sales across a range of industries. The extent of the impact of COVID-19 on our operational and financial performance will depend on certain developments, including the duration and spread of the outbreak, impact on our customers, employees and vendors all of which are uncertain and cannot be predicted. At this point, the extent to which COVID-19 may impact our financial condition or results of operations is uncertain.

APPENDIX B
Identifying Forward-looking Disclosures From MD&A

Following prior literature (2010 Li), I form forward-looking MD&A disclosures by first extracting sentences include "will," "should," "can," "could," "may," "might," "expect," "anticipate," "believe," "plan," "hope," "intend," "seek," "project," "forecast," "objective," or "goal." from MD&As.

Then I exclude sentences that contain "undersigned," "herein," "hereinafter," "hereof," "hereon," "hereto," "theretofore," "therein," "thereof," or "thereon," and sentences that include words like "expected," "anticipated," "forecasted," "projected," or "believed" which follow "was," "were," "had," and "had been." These sentences are usually legal language or boilerplate sentences, which are not associated with forward-looking statements in MD&As.

To ensure the quality and correction of extraction and formation, I randomly choose 1,000 MD&As and assign them to business students who took Intermediate I and II course recently and have completed the training regarding MD&A disclosure. They manually identify forward-looking sentences contained in these MD&As and make comparisons with the extracted forward-forwarding sentences. The untabluated results validate the formation process of forward-looking disclosures from MD&As.

APPENDIX C
Variable Definition

Variable	Definition
Accuracy	The absolute value of the mean analyst forecast error.
Age	The natural logarithm of a firm's lifetime, which defined as the first date listed on Compustat to the current date.
Age_Diff	The absolute value of difference in age between firm *i* and two-digit SIC industry peer *j*. Age is the natural logarithm of a firm's lifetime, which is defined as the first date listed on Compustat to the current date.
Age_Min	The minimum value of age in firm-pair firm *i* and two-digit SIC industry peer *j*.
Audit_Same	Coded 1 if both firm *i* and two-digit SIC industry peer *j* are served by the same auditing firms, and 0 otherwise.
BM_Diff	The absolute value of difference in market-to-book ratio between firm *i* and two-digit SIC industry peer *j*. Book-to-Market ratio is calculated as book value of equity divided by market value of equity.
BM_Min	The minimum value of book-to-market ratio in firm-pair firm *i* and two-digit SIC industry peer *j*.
Central	Coded 1 if either firm *i* or two-digit SIC industry peer *j* is a centralized firm, 0 otherwise. Centralization is proxied based on Garrett et al. 2014. Firms are defined as centralized firms if they have the values greater than the industry median value of the current year.
CFO_Diff	The absolute value of difference in cash flows from operations between firm *i* and two-digit SIC industry peer *j*.
CFO_Min	The minimum value of cash flows from operations in firm-pair firm *i* and two-digit SIC industry peer *j*.
Closeness	The natural logarithm of the distance between the headquarters firm *i* and two-digit SIC industry peer *j* and multiple it by negative one.
Competition	Proxied by *Herfindahl Index* and *Four-firm Concentration Ratio* and both indexes are multiplied by negative one.

Coverage	The number of analysts issuing annual earnings forecast for the firm.
Director_Same	Coded 1 if both firm *i* and two-digit SIC industry peer *j* have directors in common currently, and 0 otherwise.
Dispersion	The standard deviation of analysts' forecasts.
Earn_Volatility	The standard deviation of a firm's quarterly earnings over the past 16 quarters.
Earnings Volatility	The industry mean standard deviation of firms' earnings over the past 16 quarters.
Econ_Similarity1	The economic similarity between firm *i* and two-digit SIC industry peer *j* for year *t*, proxied by the comparability measure following De Franco et al. (2011).
Econ_Similarity2	The economic similarity between firm *i* and two-digit SIC industry peer *j* for year *t*, proxied by the comparability measure following Barth et al. (2012).
Forward-looking Disclosure Similarity Score	The similarity between forward-looking disclosures in MD&As of firm *i* and two-digit SIC industry peer *j* for year *t*, which is the similarity score calculated by using the Vector Space Model with TD- IDF weighting.
Four-firm Concentration Ratio	The market share of the four largest firms in an industry during the current year.
Herfindahl Index	The sum of squared market shares of a firm within the industry during the current year.
Investor_Same	Coded 1 if both firm *i* and two-digit SIC industry peer *j* have the same institutional investors, and 0 otherwise.
Lead	Coded 1 if either firm *i* or two-digit SIC industry peer *j* is a leading firm listed on S&P 500, and 0 otherwise.
Length_Diff	The absolute value of difference in MD&A length between firm *i* and two-digit SIC industry peer *j*. MD&A length is the natural logarithm of the number of words in the firm's MD&A for year *t*.
Length_Min	The minimum value of MD&A length in firm-pair firm *i* and two-digit SIC industry peer *j*.

Lengthfl_Diff	The absolute value of difference in forward-looking disclosure length between firm *i* and two-digit SIC industry peer *j*. Forward-looking disclosure length is the natural logarithm of the number of words in the firm's forward-looking disclosure for year *t*.
Lengthfl_Min	The minimum value of forward-looking disclosure in firm-pair firm *i* and two-digit SIC industry peer *j*.
Leverage	The sum of long-term debt divided by total assets.
Lev_Diff	The absolute value of difference in leverage between firm *i* and two-digit SIC industry peer *j*. Leverage is calculated as total debt divided by total assets.
Lev_Min	The minimum value of leverage in firm-pair firm *i* and two-digit SIC industry peer *j*.
Loss	Coded 1 if either firm *i* or two-digit SIC industry peer *j* reports a negative income, and 0 otherwise.
Loss_firm	Coded 1 if a firm reports a negative income, and 0 otherwise.
Mature	Coded 1 if either firm i or two-digit SIC industry peer *j* is at the mature stage, and 0 otherwise. Mature firms are defined following Dickinson (2011).
MB	Market-to-Book ratio as market value of equity divided by book value of equity.
MD&A Modification Raw	The difference between firm *i*'s MD&A of year *t* and year *t-1*, following Brown and Tucker (2011).
MD&A Modification	The difference between firm *i*'s MD&A of year *t* and year *t-1* after adjusted by the MD&A length, following Brown and Tucker (2011).
MD&A Similarity	The median value of MD&A similarity scores among firm *i* and its all two-digit SIC industry peer *j* for year *t*.
MD&A Similarity Score	The similarity between MD&As of firm *i* and two-digit SIC industry peer *j* for year *t*, which is the similarity score calculated by using the Vector Space Model with TD- IDF weighting.
MD&A Similarity Score 2	MD&A similarity score after adjusted by the average MD&A length of firm *i* and peer *j*. It is the residual of regressing MD&A similarity score on the first five polynomials of the average MDA

	length of firm pair. MD&A length is the natural logarithm of the number of words in the firm's MD&A for year *t*.
Miss	Coded 1 if either firm *i* or two-digit SIC industry peer *j* misses the analyst forecast, and 0 otherwise.
MSA_Same	Coded 1 if firm *i* and two-digit SIC industry peer *j* are located in the same Metropolitan Statistical Area, and 0 otherwise.
Post	Coded 1 for periods after relocation, and 0 otherwise.
Ret_Volatility	The standard deviation of a firm's monthly stock returns during the year.
Revenue Volatility	The industry mean standard deviation of firms' revenue over the past 16 quarter.
ROA	Net income before extraordinary items deflated by average assets.
ROA_Diff	The absolute value of difference in ROA between firm *i* and two-digit SIC industry peer *j*. ROA is net income before extraordinary items deflated by average assets.
ROA_Min	The minimum value of ROA in firm-pair firm *i* and two-digit SIC industry peer *j*.
Shortdebt_Diff	The absolute value of the difference in short-term debt between firm *i* and two-digit SIC industry peer *j*. Short-term debt is the amount of debt due in the coming year, scaled by total assets.
Shortdebt_Min	The Minimum value of short-term debt in firm-pair firm *i* and two-digit SIC industry peer *j*.
Size	The natural logarithm of a firm's market value.
Size_Diff	The absolute value of difference in size between firm *i* and two-digit SIC industry peer *j*, where size equals the natural logarithm of total assets.
Size_Min	The minimum value of size in firm-pair firm *i* and two-digit SIC industry peer *j*.
Social_Capital	The social capital index calculated following Rupasingha et al. (2006).

Treat	Coded 1 for relocating firms as treatment firms, and 0 for control firms.
Uncertainty	Proxied by *Revenue Volatility* and *Earnings Volatility* at the industry level.
Young	Coded 1 if either age of firm *i* or age of two-digit SIC industry peer *j* is below the industry median of the current year, and 0 otherwise.

Figure 1. The Trend of MD&A Similarity Over the Sample Period

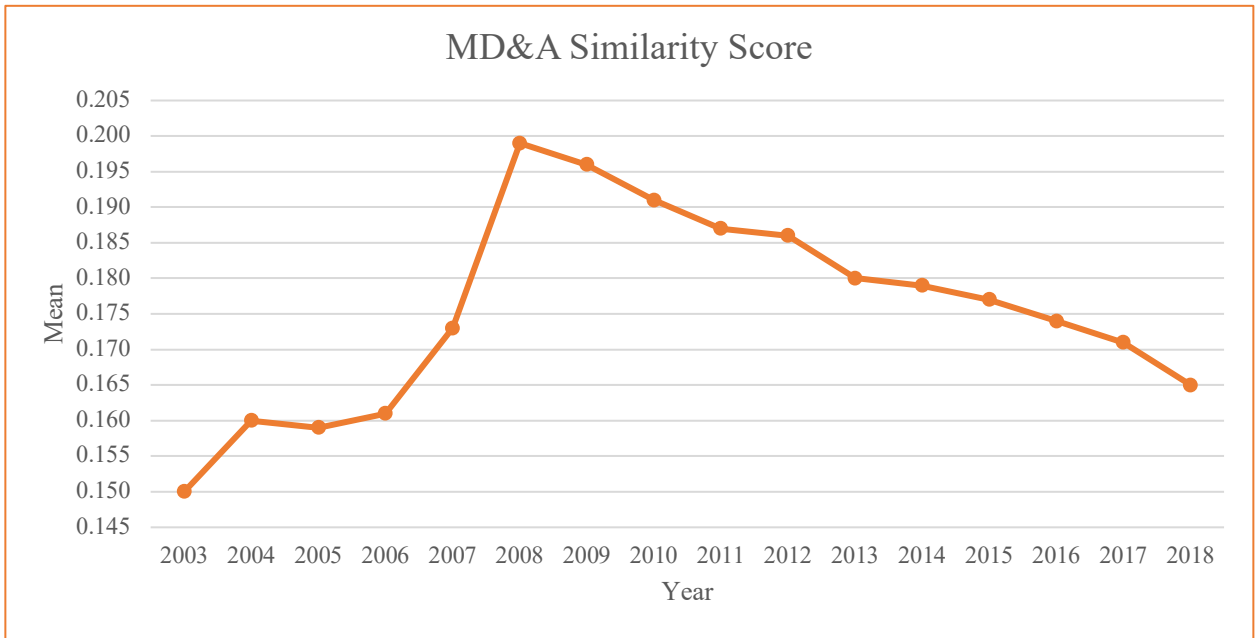

Figure 2. The Trend of Forward-looking MD&A Disclosure Similarity Over the Sample Period

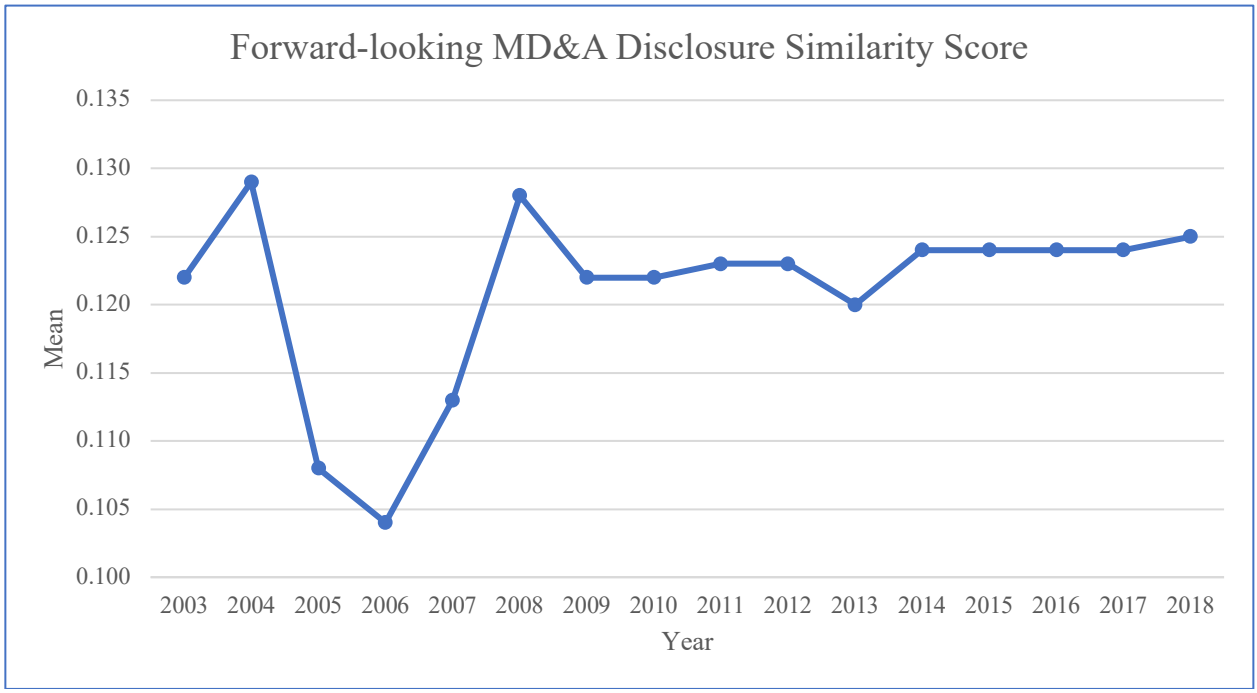

Table 1. Descriptive Statistics

This table presents descriptive statistics for all 6,366,258 firm-pairs for the sample period. The sample period is from 2003 to 2018.

Variables	Mean	St.Dev	p25	Median	p75
MD&A Similarity Score	0.1768	0.1395	0.0769	0.1338	0.2296
MSA_Same	0.1008	0.3011	0.0000	0.0000	0.0000
Audit_Same	0.1749	0.3799	0.0000	0.0000	0.0000
Size_Diff	2.0051	1.5485	0.7669	1.6546	2.9025
Size_Min	5.2078	1.6861	3.9306	5.1192	6.4350
Lev_Diff	0.1991	0.2020	0.0405	0.1382	0.2957
Lev_Min	0.0965	0.1466	0.0000	0.0134	0.1405
BM_Diff	0.4152	0.4130	0.1260	0.2869	0.5617
BM_Min	0.3207	0.3404	0.1259	0.2678	0.4866
ROA_Diff	0.2057	0.2691	0.0268	0.0950	0.2732
ROA_Min	-0.1763	0.3136	-0.2616	-0.0254	0.0130
CFO_Diff	0.2138	0.2842	0.0322	0.1042	0.2677
CFO_Min	-0.1208	0.3284	-0.1587	0.0094	0.0617
Age_Diff	0.7498	0.5906	0.2683	0.6190	1.0986
Age_Min	2.2561	0.5983	1.7918	2.3026	2.7081
Shortdebt_Diff	0.0593	0.1059	0.0019	0.0184	0.0641
Shortdebt_Min	0.0089	0.0211	0.0000	0.0000	0.0053
Length_Diff	0.5028	0.3981	0.1916	0.4103	0.7175
Length_Min	8.8999	0.4296	8.6472	8.9419	9.1917

Table 2. Trend of Variables of Interest (Mean)

This table presents the mean of *MSA_Same* and *MD&A Similarity Score* by year.

Year	*MSA_Same*	*MD&A Similarity Score*
2003	0.1215	0.1504
2004	0.1037	0.1596
2005	0.0955	0.1588
2006	0.0964	0.1615
2007	0.1000	0.1734
2008	0.0962	0.1987
2009	0.0988	0.1959
2010	0.0992	0.1910
2011	0.0996	0.1871
2012	0.1002	0.1859
2013	0.0982	0.1804
2014	0.0993	0.1788
2015	0.1011	0.1765
2016	0.1027	0.1737
2017	0.1038	0.1711
2018	0.1377	0.1652

Table 3. Bivariate Analysis for MD&A Similarity

This table reports the results for the bivariate analyses of MD&A similarity at the firm level. The measure of MD&A similarity is *MD&A Similarity Score*. Variable definitions are in Appendix C. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Comparison of MD&A similarity scores for firms located in the same MSA with the same versus different two-digit SIC codes

Variables	Same SIC2	Different SIC2	Difference	t Stat
Similarity score (Mean)	0.196	0.109	0.087***	120.64
Similarity score (Median)	0.192	0.100	0.092***	121.64

Panel B: Comparison of MD&A similarity scores for two-digit SIC industry peer firms located in the same versus different MSAs

Variables	Same MSA	Different MSA	Difference	t Stat
Similarity score (Mean)	0.198	0.180	0.018***	20.10
Similarity score (Median)	0.194	0.175	0.019***	19.27

Table 4. Pair Level Analysis: MD&A Similarity Among Local Industry Peer Firms

This table shows the results of OLS regressions of *MD&A Similarity Score* (dependent variable) on *MSA_Same*, which examines the pairwise MD&A similarity among local two-digit SIC industry peer firms. MD&A similarity is measured on *MD&A Similarity Score* between firm *i* and peer *j*. The variable of interest, *MSA_Same*, is in Bold, which is coded 1 if a pair of industry peer firms are located at the same MSA, and 0 otherwise. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively. The sample period is from 2003 to 2018.

	(1)	(2)
DV	*MD&A Similarity Score*	
MSA_Same	**0.013*** **	**0.010*** **
	(14.133)	**(12.497)**
Audit_Same		0.003***
		(4.828)
Size_Diff		-0.003***
		(-6.892)
Size_Min		0.003***
		(3.676)
Lev_Diff		-0.036***
		(-11.945)
Lev_Min		0.033***
		(5.628)
BM_Diff		-0.018***
		(-13.912)
BM_Min		0.002
		(0.897)
ROA_Diff		-0.063***
		(-18.770)
ROA_Min		-0.063***
		(-15.568)
CFO_Diff		-0.028***
		(-8.638)
CFO_Min		-0.010***
		(-2.790)
Age_Diff		-0.015***
		(-13.056)
Age_Min		-0.014***
		(-10.079)
Shortdebt_Diff		-0.059***
		(-13.332)
Shortdebt_Min		-0.169***
		(-6.505)
Length_Diff		-0.018***
		(-9.358)
Length_Min		-0.010***
		(-3.730)
Intercept	0.175***	0.330***
	(170.214)	(14.369)
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes
Cluster	Yes	Yes
R-squared	0.409	0.442
Observations	6,366,258	6,366,258

Table 5. Inter-organization Social Networks

This table reports the results of the tests regarding the role of inter-organizational social networks. The dependent variable is *MD&A Similarity Score* between firm *i* and two-digital SIC industry peer *j*. Inter-organization social networks are more likely to exist if 1) peer firms have directors in common currently (Panel A); 2) peer firms are served by the same audit firms (Panel B); 3) peer firms have the same institutional investors (Panel C); 4) peer firms located in the industry clusters with strong local social networks (Panel D). The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Shared director

DV	*MD&A Similarity Score*
MSA_Same* Director_Same	**0.0113***** **(3.15)**
MSA_Same	**0.0096***** **(11.83)**
Director_Same	**0.2783***** **(4.32)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,366,258
adj. R-sq	0.4423

Panel B: Same auditor

DV	*MD&A Similarity Score*
MSA_Same* Audit_Same	**0.0091***** **(8.57)**
MSA_Same	**0.0083***** **(9.92)**
Audit_Same	**-0.0012** **(-0.07)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,366,258
adj. R-sq	0.4422

Panel C: Same investor

DV	*MD&A Similarity Score*
MSA_Same* Investor_Same	**0.0204*** **(1.87)**
MSA_Same	**0.0107***** **(12.83)**
Investor_Same	**0.0732** **(0.80)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	5,857,482
adj. R-sq	0.4409

Table 5 (Continued)

Panel D: Local social network

DV	*MD&A Similarity Score*
MSA_Same* Social_Capital	**0.0241***** **(8.61)**
MSA_Same	**0.0185***** **(11.16)**
Social_Capital	**-0.0929*** **(-1.67)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	3,331,226
adj. R-sq	0.4566

Table 6. Uncertainty

This table presents the results of examining whether MD&A similarity among local industry peers will be more pronounced when uncertainty is high. The dependent variable is *MD&A Similarity Score* between firm *i* and two-digital SIC industry peer *j*. Uncertainty is measured by industry-level revenue volatility in Panel A and industry-level earnings volatility in Panel B. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Revenue volatility

DV	*MD&A Similarity Score*
MSA_Same*Uncertainty	**0.0441*** **
	(7.20)
MSA_Same	**0.0035*** **
	(2.87)
Uncertainty	**-0.3623*** **
	(-3.29)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,364,902
adj. R-sq	0.4438

Panel B: Earning volatility

DV	*MD&A Similarity Score*
MSA_Same*Uncertainty	**0.0799*** **
	(2.59)
MSA_Same	**0.0061*** **
	(3.89)
Uncertainty	**-1.6923*** **
	(-2.77)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,364,902
adj. R-sq	0.4439

Table 7. Competition

This table presents the results of examining the moderate role of competition. The dependent variable is *MD&A Similarity Score* between firm *i* and two-digital SIC industry peer *j*. Competition is measured by *Herfindahl Index* in Panel A and *Four-firm Concentration Ratio* in Panel B at the industry level. The variables of interest are in Bold. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Herfindahl index

DV	*MD&A Similarity Score*
MSA_Same*Competition	**-0.1078***** **(-3.33)**
MSA_Same	**0.0066***** **(4.96)**
Competition	**4.8618***** **(6.64)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,366,258
adj. R-sq	0.4439

Panel B: Four-firm concentration ratio

DV	*MD&A Similarity Score*
MSA_Same*Competition	**-0.1480***** **(-4.66)**
MSA_Same	**0.0067***** **(6.37)**
Competition	**5.7823***** **(7.47)**
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,366,258
adj. R-sq	0.4438

Table 8. Young Firms and Centralized Firms

This table presents the results of examining whether MD&A similarity among local peer firms will be more pronounced for young firms or centralized firms. In Panel A, *Young* indicates that either firm *i* or peer *j* is a young firm. In Panel B, *Central* indicates that either firm *i* or peer *j* is a centralized firm. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Young firms

DV	*MD&A Similarity Score*
MSA_Same* Young	**0.0043*** **
	(3.66)
MSA_Same	**0.0054*** **
	(4.53)
Young	**-0.0054**
	(-0.27)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	5,178,118
adj. R-sq	0.4416

Panel B: Centralized firms

DV	*MD&A Similarity Score*
MSA_Same* Central	**0.0110*** **
	(4.67)
MSA_Same	**0.0050** **
	(2.23)
Central	**-0.2894*** **
	(-5.48)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	465,864
adj. R-sq	0.2952

Table 9. Leading Firms and Mature Firms

This table presents the results of examining whether MD&A similarity among local peer firms will not be pronounced for leading firms or mature firms. In Panel A, *Lead* indicates that either firm *i* or peer *j* is a leading firm. In Panel B, *Mature* indicates that either firm *i* or peer *j* is at the mature stage. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Leading firms

DV	*MD&A Similarity Score*
MSA_Same*Lead	**0.0005**
	(0.27)
MSA_Same	**0.0100*** **
	(12.15)
Lead	**-0.0367**
	(-0.84)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	6,310,186
adj. R-sq	0.4480

Panel B: Mature firms

DV	*MD&A Similarity Score*
MSA_Same*Mature	**-0.0016**
	(-1.58)
MSA_Same	**0.0106*** **
	(12.69)
Mature	**-0.1338*** **
	(-5.78)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	5,734,438
adj. R-sq	0.4601

Table 10. Loss Firms and Firms Having a Negative Earnings Surprise

This table presents the results of the analyses of MD&A similarity among local peer firms for loss firms or firms having a negative earnings surprise. The dependent variable is *MD&A Similarity Score* between firm *i* and two-digital SIC industry peer *j*. In Panel A, *Loss* indicates that either firm *i* or peer *j* has negative net income. In Panel B *Miss* indicates that either firm *i* or peer *j* misses analyst forecasts. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Loss firms

DV	*MD&A Similarity Score*
MSA_Same*Loss	**-0.0037*** **
	(-3.70)
MSA_Same	**0.0123*** **
	(11.35)
Loss	**-0.1561*** **
	(-5.63)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	5,154,800
adj. R-sq	0.4640

Panel B: Firms having a negative earnings surprise

DV	*MD&A Similarity Score*
MSA_Same*Miss	**-0.0044*** **
	(5.07)
MSA_Same	**0.0158*** **
	(14.48)
Miss	**-0.0082**
	(-0.56)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	3,376,764
adj. R-sq	0.3890

Table 11. Difference in Differences Analysis: Relocation

This table presents the results of the relocation analysis that examines the change of relocating firms' MD&A similarity among local two-digit industry peers after firms relocate from one MSA to another MSA. The dependent variable is *MD&A Similarity Score* between firm *i* and peer *j*. *Post* set to 1 if it is the post-relocation period. *Treat* is set to 1 if a firm relocated from one MSA to another MSA during the sample period, which makes up the treatment group. The control groups are made up of non-relocating peer firms from the new MSA or original MSA. The variables of interest are in Bold. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: New MSA

DV	*MD&A Similarity Score*
Treat*Post	**0.0351****
	(1.98)
Treat	**-0.0331*****
	(-2.80)
Post	**-0.0035**
	(-0.02)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	2,094
adj. R-sq	0.4750

Panel B: Original MSA

DV	*MD&A Similarity Score*
Treat*Post	**0.0172**
	(1.05)
Treat	**0.0021**
	(0.12)
Post	**0.0305**
	(0.16)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	1,602
adj. R-sq	0.3796

Table 12. Pair Level Analysis: Forward-looking Disclosure Similarity Among Local Industry Peer Firms

This table shows the results of OLS regressions of *Forward-looking Disclosure Similarity Score* (dependent variable) on *MSA_Same*, which examine the pairwise forward-looking MD&A disclosure similarity among local two-digit SIC industry peer firms. The variable of interest, *MSA_Same*, is in Bold, which is coded 1 if a pair of peer firms are located at the same MSA, and 0 otherwise. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively. The sample period is from 2003 to 2018.

	(1)	(2)
DV	*Forward-looking Disclosure Similarity Score*	
MSA_Same	**0.015*** **	**0.011*** **
	(19.720)	**(16.829)**
Audit_Same		0.005***
		(8.736)
Size_Diff		-0.003***
		(-10.857)
Size_Min		0.001
		(1.194)
Lev_Diff		-0.036***
		(-18.017)
Lev_Min		0.004
		(0.980)
BM_Diff		-0.015***
		(-18.113)
BM_min		0.001
		(0.780)
ROA_Diff		-0.056***
		(-21.307)
ROA_Min		-0.052***
		(-17.162)
CFO_Diff		-0.032***
		(-13.735)
CFO_Min		-0.024***
		(-9.166)
Age_Diff		-0.015***
		(-18.654)
Age_Min		-0.013***
		(-13.427)
Shortdebt_Diff		-0.038***
		(-11.761)
Shortdebt_Min		-0.099***
		(-6.195)
Lengthfl_Diff		0.006***
		(5.595)
Lengthfl_Min		0.036***
		(24.702)
Intercept	0.119***	-0.089***
	(175.954)	(-8.146)
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes
Cluster	Yes	Yes
R-squared	0.275	0.354
Observations	6,365,834	6,365,834

Table 13. Underlying Economic Forces

This table shows the results of the random subsample tests of forward-looking disclosure similarity (FLD) among local industry peer firms. In Panel A, forward-looking disclosure similarity is remeasured after removing all sentences that contain information about a specific geographic location (Column 1). In Panel 2 and 3, forward-looking disclosure similarity is remeasured by using unique word dictionaries for industry and year, respectively (Column 1). Column 2 presents the results using the original forward-looking disclosure similarity measure. The variable of interest, *MSA_Same*, is in Bold. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Removing sentences with information about a specific geographic location

	(1)	*(2)*
DV	*FLD Similarity Score*	*Original FLD Similarity Score*
MSA_Same	**0.010*** **	**0.009*** **
	(10.18)	**(9.89)**
Intercept and Controls	Yes	Yes
FE	Yes	Yes
Cluster	Yes	Yes
N	467,292	467,292
adj. R-sq	0.356	0.345

Panel B: Using unique word dictionary for industry

	(1)	*(2)*
DV	*FLD Similarity Score*	*Original FLD Similarity Score*
MSA_Same	**0.007*** **	**0.014*** **
	(10.55)	**(11.82)**
Intercept and Controls	Yes	Yes
FE	Yes	Yes
Cluster	Yes	Yes
N	157,212	157,212
adj. R-sq	0.426	0.314

Panel C: Using unique word dictionary for year

	(1)	*(2)*
DV	*FLD Similarity Score*	*Original FLD Similarity Score*
MSA_Same	**0.004*** **	**0.008*** **
	(5.59)	**(4.09)**
Intercept and Controls	Yes	Yes
FE	Yes	Yes
Cluster	Yes	Yes
N	41,484	41,484
adj. R-sq	0.301	0.406

Table 14. Matched Sample: Economic Similarity

This table presents the analyses of MD&A similarity among local industry peers using a matched sample. Firm-peer pairs from the same industry clusters are matched to the pairs from different industry clusters on year, industry, and economic similarity. Economic similarity is proxied by using *Econ_Similarity1* in Panel A and *Econ_Similarity2* in Panel B. The dependent variable is MD&A similarity score between firm *i* and two-digital SIC industry peer *j*. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively. The sample period is from 2003 to 2018.

Panel A: Econ_Similarity1

DV	*MD&A Similarity Score*
MSA_Same	**0.0087*** **
	(8.25)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	475,178
adj. R-sq	0.3902

Panel B: Econ_Similarity2

DV	*MD&A Similarity Score*
MSA_Same	**0.0087*** **
	(7.90)
Intercept and Controls	Yes
FE	Yes
Cluster	Yes
N	457,912
adj. R-sq	0.3584

Table 15. Economic Similarity

This table shows the results of examining the pairwise MD&A similarity among local industry peer firms after adding additional control variables for economic similarity among peer firms. In Columns 1 and 2, economic similarity is proxied by *Econ_Similarity1* and *Econ_Similarity2*, respectively. The variable of interest, *MSA_Same*, is in Bold, which is coded 1 if a pair of peer firms are located at the same MSA, and 0 otherwise. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)
DV	*MD&A Similarity Score*	
MSA_Same	**0.010*** **	**0.009*** **
	(8.906)	**(8.085)**
Econ_Similarity1	**-0.000**	
	(-0.135)	
Econ_Similarity2		**0.001*** **
		(11.715)
Audit_Same	0.001*	0.002***
	(1.821)	(3.187)
Size_Diff	-0.003***	-0.002***
	(-5.541)	(-3.728)
Size_Min	0.003***	0.003***
	(3.119)	(3.042)
Lev_Diff	-0.029***	-0.034***
	(-7.244)	(-7.685)
Lev_Min	0.066***	0.066***
	(7.869)	(7.718)
BM_Diff	-0.021***	-0.021***
	(-12.295)	(-12.873)
BM_min	0.008**	-0.002
	(2.181)	(-0.439)
ROA_Diff	-0.056***	-0.066***
	(-10.323)	(-9.480)
ROA_Min	-0.069***	-0.081***
	(-10.831)	(-10.185)
CFO_Diff	-0.038***	-0.033***
	(-6.122)	(-4.352)
CFO_Min	-0.005	0.001
	(-0.742)	(0.176)
Age_Diff	-0.016***	-0.014***
	(-8.698)	(-7.931)
Age_Min	-0.013***	-0.014***
	(-5.221)	(-6.083)
Shortdebt_Diff	-0.092***	-0.095***
	(-12.780)	(-12.436)
Shortdebt_Min	-0.236***	-0.114***
	(-6.395)	(-3.410)
Length_Diff	-0.017***	-0.017***
	(-6.753)	(-7.480)
Length_Min	-0.018***	-0.019***
	(-5.350)	(-5.441)
Intercept	0.405***	0.418***
	(13.375)	(14.023)
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes

Cluster	Yes	Yes
R-squared	0.467	0.450
Observations	2,450,083	2,306,645

Table 16. Alternative Measure of MD&A Similarity

This table shows the results of examining the pairwise MD&A similarity among local industry peer firms using *MD&A Similarity Score 2* as an alternative measure. The variable of interest, *MSA_Same*, is in Bold, which is coded 1 if a pair of peer firms are located at the same MSA, and 0 otherwise. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)
DV	*MD&A Similarity Score 2*	
MSA_Same	**0.010*** **	**0.009*** **
	(11.267)	**(10.281)**
Audit_Same		0.004***
		(6.347)
Size_Diff		-0.010***
		(-21.869)
Size_Min		-0.011***
		(-16.133)
Lev_Diff		-0.041***
		(-13.299)
Lev_Min		0.019***
		(3.163)
BM_Diff		-0.019***
		(-14.379)
BM_Min		0.002
		(0.721)
ROA_Diff		-0.059***
		(-16.933)
ROA_Min		-0.049***
		(-11.564)
CFO_Diff		-0.026***
		(-7.803)
CFO_Min		-0.012***
		(-3.245)
Age_Diff		-0.013***
		(-11.187)
Age_Min		-0.011***
		(-7.939)
Shortdebt_Diff		-0.061***
		(-13.541)
Shortdebt_Min		-0.166***
		(-6.317)
Intercept	-0.001	0.135***
	(-0.898)	(23.911)
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes
Cluster	Yes	Yes
R-squared	0.348	0.391
Observations	6,366,258	6,366,258

Table 17. Alternative Measure of Industry Peer Firms From Same Geographic Industry Clusters

This table shows the results of examining the pairwise MD&A similarity among local industry peer firms by calculating the geographic distance between firm *i* and peer *j*. The variable of interest, *Closeness*, is in Bold. The regressions use industry, fiscal year, and MSA fixed effects. Errors are clustered by firm. Variable definitions are in Appendix C. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)
DV	*MD&A Similarity Score*	
Closeness	**0.002*** **	**0.002*** **
	(13.454)	**(11.528)**
Audit_Same		0.003***
		(4.801)
Size_Diff		-0.003***
		(-6.886)
Size_Min		0.003***
		(3.694)
Lev_Diff		-0.036***
		(-11.946)
Lev_Min		0.033***
		(5.559)
BM_Diff		-0.018***
		(-13.927)
BM_Min		0.002
		(0.843)
ROA_Diff		-0.063***
		(-18.778)
ROA_Min		-0.063***
		(-15.591)
CFO_Diff		-0.028***
		(-8.633)
CFO_Min		-0.010***
		(-2.770)
Age_Diff		-0.015***
		(-13.065)
Age_Min		-0.014***
		(-10.094)
Shortdebt_Diff		-0.059***
		(-13.313)
Shortdebt_Min		-0.170***
		(-6.511)
Length_Diff		-0.018***
		(-9.360)
Length_Min		-0.010***
		(-3.736)
Intercept	0.192***	0.343***
	(125.648)	(14.958)
Industry FE	Yes	Yes
Year FE	Yes	Yes
MSA FE	Yes	Yes
Cluster	Yes	Yes
R-squared	0.409	0.442
Observations	6,366,258	6,366,258

Table 18. Firm Level Analysis: MD&A Similarity and MD&A Modification

This table reports the results of examining the association between MD&A similarity among industry peers and MD&A modification. This table presents OLS regression estimates of MD&A modification for year *t* (Columns 1 and 2) and MD&A modification for year *t+1* (Columns 3 and 4) on cross-sectional MD&A similarity for year *t* at the firm level. The variable of interest is in Bold. Variable definitions are in Appendix C. The regressions use industry and fiscal year fixed effects. Errors are clustered by firm. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)	(3)	(4)
DV	*MD&A Modification* $_t$	*MD&A Modification Raw* $_t$	*MD&A Modification* $_{t+1}$	*MD&A Modification Raw* $_{t+1}$
MD&A Similarity	**0.0376*** **	**0.0368** **	**0.0905*** **	**0.0907*** **
	(2.6045)	**(2.5634)**	**(6.3288)**	**(6.3456)**
Size	0.0010	-0.0029***	0.0007	-0.0031***
	(1.3611)	(-4.0154)	(1.0133)	(-4.6223)
Leverage	0.0387***	0.0236***	0.0108*	-0.0042
	(6.2515)	(3.8046)	(1.8514)	(-0.7158)
MB	-0.0000	-0.0000	0.0000	0.0000
	(-1.2277)	(-0.4532)	(0.0350)	(0.5364)
ROA	-0.0247***	-0.0257***	-0.0115*	-0.0120*
	(-2.9760)	(-3.0820)	(-1.6953)	(-1.7672)
Age	0.0040**	0.0035**	0.0005	0.0002
	(2.3115)	(2.0269)	(0.2963)	(0.1101)
Earn_Volatility	0.0000	0.0001	-0.0002	-0.0001
	(0.2085)	(0.5009)	(-1.2460)	(-0.8576)
Ret_Volatility	0.0971***	0.0892***	0.0369**	0.0299*
	(6.5476)	(5.9132)	(2.3896)	(1.8639)
Loss_firm	0.0084***	0.0043	0.0002	-0.0035
	(2.9541)	(1.5186)	(0.0855)	(-1.3844)
Intercept	-0.0451***	0.1033***	-0.0335***	0.1134***
	(-6.0016)	(13.7382)	(-4.4756)	(15.1297)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
R-squared	0.0713	0.0866	0.0619	0.0811
Observations	19,109	19,109	19,109	19,109

Table 19. Firm Level Analysis: MD&A Similarity and Analyst

This table presents OLS regression estimates of analyst coverage, dispersion, and accuracy on cross-sectional MD&A similarity at the firm level. The variable of interest is in Bold. Variable definitions are in Appendix C. The regressions use industry and fiscal year fixed effects. Errors are clustered by firm. Continuous variables are winsorized. T-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)	(3)
DV	*Coverage* $_{t+1}$	*Dispersion* $_{t+1}$	*Accuracy* $_{t+1}$
MD&A Similarity	**4.9300*** **	**-0.0576*** **	**0.0710*** **
	(3.2078)	**(-2.8239)**	**(3.2182)**
Size	4.7949***	-0.0082***	0.0099***
	(57.3207)	(-8.8028)	(9.5783)
Leverage	-1.1930**	0.0253**	-0.0221**
	(-2.2266)	(2.5744)	(-2.1092)
MB	0.0012	-0.0001***	0.0001**
	(0.7826)	(-2.6274)	(2.3925)
ROA	-2.6884***	-0.1279***	0.1212***
	(-6.5818)	(-4.7603)	(4.3069)
Age	-1.6787***	0.0015	-0.0031
	(-9.5337)	(0.6434)	(-1.1953)
Earn_Volatility	0.0206*	-0.0004	0.0003
	(1.7171)	(-1.3713)	(1.1387)
Ret_Volatility	5.0439***	0.0886***	-0.0708**
	(3.7572)	(2.6158)	(-2.0667)
Loss_firm	1.4691***	0.0110*	-0.0122*
	(7.8393)	(1.8255)	(-1.8599)
Intercept	-17.8259***	0.0735***	-0.0855***
	(-24.1235)	(6.2192)	(-6.8108)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Yes	Yes	Yes
R-squared	0.6547	0.1060	0.0936
Observations	19,109	19,109	19,109