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I dedicate this work to my wife, Carrisa S. Hoelscher; without her love, support, and understanding this would not have been possible. I also dedicate this work to my parents, R. C. and Diane Hoelscher, who are my biggest advocates and cheerleaders. Finally, this would not be possible without the support of my family – Dennis and Cindie Hicks, Brian and Alisa Brown and family, Tyson and Kendra Brown, Buddy Huttanus, Brianna Lane, Brodie Montgomery, Cameron Piercy and family, Alaina Zanin, and all my other great friends, who have helped me during my doctoral studies.

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Abstract

This dissertation is a collection of three essays that investigate the role and importance of discretionary disclosures by managers, stock price comovement and government intervention into financial markets during a financial crisis. Chapter 1 explores the governance implications on a firm's information environment in the context of discretionary hedging disclosures made by oil and gas companies from 1991 to 2013. Firms with poor governance relative to industry peers are more likely to voluntarily disclose hedging changes and do so more frequently. My findings indicate that discretionary disclosures and governance are substitutes as firms increase their transparency to offset relatively poor governance based on traditional measures of corporate governance. I also provide evidence that poorly (well) governed firms with high institutional ownership are more (less) likely to increase the transparency of their hedging policy changes through discretionary disclosures.

Chapter 2 investigates how a firm's dividend initiation announcement (positive news) influences stock prices of seemingly unrelated firms within the same metropolitan statistical area (MSA). After accounting for firm, industry, and geographic characteristics, dividend paying firms located in areas with a higher percentage of dividend clientele experience a positive comovement reaction when a seemingly unrelated firm within the same MSA announces a dividend initiation. The positive reactions are specifically for dividend paying firms, while non-dividend payers exhibit no significant response. These results are robust to numerous regression methods and alternative explanations. Collectively, these findings are consistent with the positive-

investor attention hypothesis, suggesting positive spillover effects from news announcements for other local firms in the presence of individual investor clientele.

Chapter 3 examines the effects of government guaranteed bank bonds. We find guaranteed bank bonds vastly improve debt liquidity, default risk, and significantly reduce the cost of debt for less liquid, more risky, and shorter-term bond issuances. Greater benefits for riskier and shorter-term bonds are related to the positive term structure of the government insurance premia combined with a negative term structure of credit spreads for weaker banks. These results are consistent with extant theory concerning the financial accelerator, credit spread term structures, and default-liquidity loops.

Chapter 1:

Discretionary Hedging Disclosures and Corporate Governance

I. Introduction

Publicly traded firms are exposed to the classical principal-agent dilemma arising from the separation of ownership and management of the firm. Shareholders employ managers with the objective of maximizing shareholder wealth; however, managerial and shareholder goals do not always align. Consequently, shareholders implement various corporate governance mechanisms to help facilitate the maximization of firm value, including various measures pertaining to the composition of the board, types of ownership, and shareholder rights provisions.[1]

Beyond the principal-agent problem, managers possess an informational advantage over outside shareholders with respect to the value of the firm and its future prospects. Managers then disclose information at their discretion. Accordingly, investors rationally expect these disclosures by management.[2] Managers must assess the additional costs and benefits associated with improving the firm's transparency to develop an optimal level of disclosure.[3] The benefits of increased transparency include reduced

[1] For example, see the following: Outside Directors – Weisbach (1988); Byrd and Hickman (1992); Brickley, Coles, and Terry (1994). Board Size - Lipton and Lorsch (1992); Jensen (1993); Yermack (1996); Eisenberg, Sundgren, and Wells (1998); and Coles, Daniel, and Naveen (2008). Types of ownership – Hartzell and Starks (2003); Parrino, Sias, and Starks (2003); Chen, Harford, and Li (2007); and Edmans (2009). Provisions - Gompers, Ishii, and Metrick (2001); Cremers and Nair (2005); and Bebchuk, Cohen, and Ferrell (2009).

[2] Aboody and Kasznik (2000) show that managers time voluntary disclosures and stock option awards. Chen, Matsumoto, and Rajgopal (2011) find evidence that managers purposefully discontinue earnings guidance. Ahern and Sosyura (2014) show that managers publicly disclose more information following the onset of merger negotiations and prior to the public announcement.

[3] Hermalin and Weisbach (2007) are one of the first to model the cost-benefit tradeoff of voluntary disclosure.

information asymmetry, greater stock liquidity, and a lower cost of equity capital.[4] The costs of increased transparency involve making the disclosure and revealing proprietary information to the market and competitors.[5]

However, the important question of how the information released through discretionary disclosure interacts with a firm's governance quality has not been resolved. Relatively better governed firms may have increased disclosure practices. This greater transparency could be due to either increased monitoring (Ajinkya, Bhojraj, and Sengupta 2005; Karamanou and Vafeas 2005) or through compensation incentives for managers (Hui and Matsunaga 2015). Conversely, better governed firms may have less need for improved transparency due to greater monitoring, whereas poorly governed companies might increase disclosure to mitigate the potential costs of the lack of transparency.[6] I address the important question of whether corporate governance and information transparency are complements or substitutes by studying the discretionary hedging disclosures made by oil and gas companies from 1991 to 2013.

The use of hedging activities is prevalent throughout the U.S. corporate sector. However, the risk management literature has failed to establish whether hedging creates shareholder value.[7] Hedging decisions induce agency concerns between debtholders and equity holders as shareholders have the incentive to unwind existing hedging positions

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[4] See the following: Amihud and Mendelson (1989), Botosan (1997), Botosan and Harris (2000), Leuz and Verrrecchia (2000), Dhaliwal, Li, Tsang, and Yang (2011), Balakrishnan et. al (2014), and others.
[5] See Verrecchia and Weber (2006) among others.
[6] For a thorough review of the entire voluntary disclosure literature, please see Healy and Palepu (2001) and Beyer, Cohen, Lys, and Walther (2010).
[7] Many studies have found a positive relationship between hedging and firm value, including Allayannis and Weston (2001), Chidambaran, Fernando, and Spindt (2001), Haushalter, Heron, and Lie (2002), Adam and Fernando (2006), MacKay and Moeller (2007), Pérez-González and Yun (2013), and Gilje and Taillard (2015). In contrast, Guay, and Kothari (2003) contend hedging is not economically meaningful, while Jin and Jorion (2006) fail to find any significant effect of hedging on shareholder value.

following debt financing, which raises doubts about the credibility of the hedge (Smith and Stulz 1985). Financial engineering solutions to address this credibility issue are available by bundling the hedge and financing into a single hybrid debt security, making the hedge uneconomical to unwind prior to the debt being repaid (Chidambaran, Fernando, and Spindt 2001). Unfortunately, this cumbersome approach diminishes the firm's flexibility to respond to changes in production and market conditions. An alternative approach to establish credibility, especially in poorly governed firms with high agency costs, is through building a reputation for enhanced disclosure (Beyer and Dye 2012). Consequently, one would expect to observe an inverse relation between governance and the level of discretionary disclosure.

Companies are required to disclose their oil and gas hedging activities in their annual SEC 10-K filings. Announcements such as earnings, dividends, and stock splits are considered material to shareholder value and obligate firms to disclose such information in a timely manner. However, changes in hedging activities are not viewed as such, and the voluntary disclosure of these activities prior to the release of the SEC filings is subject to managerial discretion.[8] In my sample, some firms voluntarily disclose their hedging transactions, others only provide this information through mandatory annual filings, and the remainder do not have any hedging positions. Examining the systematic differences across these various types of oil and gas companies offers considerable potential to empirically identify the impact governance has on discretionary disclosure practices.

[8] Nonetheless, Raman, Fernando, and Hoelscher (2015) show that hedging increase (decrease) announcements cause economically and statistically significant negative (positive) reactions in equity prices for both the announcing firm and industry in a sample of gold mining firms. I find similar results in my sample for hedging decrease announcements.

The discretionary disclosure literature has yet to arrive at a consensus on the economic definition for discretionary disclosure.[9] I hand-collect a sample of 490 discretionary announcements relating to changes in hedging policies made by oil and gas firms between January 1991 and January 2013 as a measure of disclosure. To the best of my knowledge, this is a novel measure of discretionary disclosure that has yet to be examined in the literature. The discretionary hedging announcements allow me to create four distinct measures of discretionary disclosure: (a) an indicator variable for disclosure, (b) a count variable for the number of disclosures, (c) a ratio of the number of announcements relative to the number of industry announcements, and (d) a transparency measure that incorporates the count of disclosures and the time series standard deviation of its hedge ratio. First, I use a panel regression to investigate the impact of corporate governance on discretionary disclosure practices. Second, to address and minimize sample selection bias and endogeneity, I use a Heckman (1979) two-step selection approach. This empirical framework along with the four previously described measures allow for the assurance that any results are not dependent upon the selected measure of discretionary disclosure.

I employ the *G-Index* (governance index) created by Gompers, Ishii, and Metrick (2001), the *ATI* (alternative takeover provision index) used by Cremers and Nair (2005), and the *E-Index* (entrenchment index) from Bebchuk, Cohen, and Ferrell (2009) as measures of corporate governance in deferring takeovers. Karpoff, Schonlau, and Wehrly

[9] These measures include the now-discontinued AIMR scores, indices based upon researcher judgement of financial disclosures, language processing technologies, and measures contrived from reported earnings. These measures are prone to researcher bias and are often a combination of mandatory and voluntary disclosure. Recently, the literature has focused on management forecasts and conference calls, which are voluntary.

(2015) provide empirical support that the *G-Index* and *E-Index* are viable measures for takeover deterrence after controlling for endogeneity. I find evidence that governance and discretionary disclosure are substitutes as firms with higher *G-Index* and *E-Index* scores (i.e., weaker governance) are not only more likely to voluntarily disclose hedging announcements but also to issue more announcements. Results for the *E-Index* tend to be the strongest and most robust. This finding is consistent with the conjecture by Bebchuk, Cohen, and Ferrell (2009) that some shareholder provisions are more important than others. I control for other characteristics that the literature has shown are related to a firm's disclosure policy such as financial analyst coverage, forecast dispersion, board independence, board size, and return volatility.[10] These measures tend to affect discretionary disclosure, but most consistently firms with greater analyst coverage are more likely to make discretionary announcements. The lack of support for the *ATI* confirms that there is a differential effect between provisions.

Investing in an oil and gas company is often regarded as a substitute for investing directly in oil and gas. Tufano (1998) shows that changes in hedging alter the stock price exposure of these firms to the price of oil and gas. Investors take into consideration a firm's hedging policies and differentiate between firms based upon their exposure to oil and gas prices. Consequently, investors, especially large institutional investors, will want to know if the firm changes its hedging policy. Accordingly, I find evidence that institutional ownership has a positive relationship with discretionary disclosure.[11] This

[10] Please see Ajinkya and Gift (1984), Ajinkya, Bhojraj, and Sengupta (2005), Hutton (2005), and Karamanou and Vafeas (2005), among others.
[11] This is consistent with Healy, Hutton, and Palepu (1999) and Bushee and Noe (2000).

finding indicates that institutional investors may influence the level of a firm's discretionary disclosure.

A potential concern is that a firm's initial disclosure is correlated with a change in corporate governance. In other words, an alternate explanation for my finding that the quality of governance and level of discretionary disclosure are substitutes is that, once a firm begins disclosure, they experience a subsequent change in governance and I am simply documenting the relationship. However, I find no evidence of a significant relation between a firm's decision to voluntarily disclose changes in hedging and a subsequent change in the governance of the firm.

The results that firms with a higher *E-Index* are more likely to disclose allows for the opportunity to empirically investigate which provisions might be driving the discretionary disclosure. I find that firms with provisions that limit shareholders' ability to amend bylaws, which require a super majority to approve a merger deal, and that have severance agreements for the management and board (i.e., golden parachutes) are more likely to provide discretionary disclosures. There is marginal evidence that firms that limit the ability to amend the corporate charter are less likely to disclose. Surprisingly, staggered boards do not appear to be associated with the disclosure policy of the firms; this evidence is consistent with the lack of results for the *ATI* measure, as that is the only overlapping provision.

Collectively, I find that governance and discretionary disclosure are substitutes, and that institutional ownership positively impacts the disclosure environment of the firm. The reason why firms with poor governance might actually increase transparency is relevant. Theory argues that relatively poorly governed firms would voluntarily disclose changes in hedging as the perceived cost of withholding the information is greater than the benefit from not disclosing (Hermalin and Weisbach 2007). Empirically, I find that firms with lower (higher) *E-Index* values are less (more) likely to disclose announcements when the firm has high institutional holdings. Institutional shareholders' impact on a firm's disclosure policy is differential based upon on the corporate governance of the firm.

This study contributes to the discretionary disclosure literature by providing evidence on the link between governance and determinants of disclosure. I provide a new perspective on this topic by undertaking an analysis of hedging behavior by oil and gas firms using discretionary hedging announcements as a research context. In studying firms with a homogenous exposure to market risks, I document a consistent link between the level of corporate governance and discretionary disclosure. Institutional ownership plays a pivotal role in the information environment of a firm. The results suggest the interaction between shareholder provisions and institutional ownership have ramifications on disclosure policies.

The remainder of the paper is organized as follows: Section II discusses the relevant literature and develops testable hypotheses; Section III details the sample, variables, and research design; Section IV presents and discusses empirical findings; and finally, Section V provides concluding comments.

II. Prior Literature and Hypothesis Development

A firm's disclosure environment is influenced by managers' perceived costs and benefits of increasing or decreasing disclosure to derive the optimal level for the firm.

Too little or too much disclosure could hurt the firm's value (Hermalin and Weisbach 2007). Improved disclosure can reduce information asymmetry between managers and shareholders, leading to a lower cost of capital (Diamond and Verrecchia 1991; Botosan 1997; and Botosan and Plumlee 2005). The risk of litigation due to the lack of transparency can motivate managers to increase disclosure and lead to lower settlement costs (Skinner 1994; Skinner 1997; Soffer, Thiagarajan, and Walther 2000). Managers also have the ability to influence their reputation through disclosure choices (Tucker 2007; Beyer and Dye 2012).

Two principles help motivate the idea that voluntary disclosure and corporate governance are complements. First, as managers become more entrenched, their incentives to improve transparency can be reduced (Bertrand and Mullainathan 2003; Ferreira and Laux 2007). Second, managers with less insulation from market discipline may have greater incentive to improve transparency. Doing so aligns their objectives with shareholder goals as they have greater exposure to market discipline and are at greater risk of being replaced or taken over (Ambrose and Megginson 1992). Therefore, I hypothesize that corporate governance and voluntary disclosure act as complements as oil and gas companies with stronger shareholder protection are more likely to voluntarily disclose.

There is considerable empirical evidence that suggests disclosure and governance act as complements. Bens (2002) finds a positive relationship between disclosure and shareholder monitoring. A country's judicial regime also influences firm transparency (Bushman, Piotroski, and Smith 2004) as well as ownership concentration and the informativeness of company disclosure (Fan and Wong 2002). Dual class share companies have lower earnings informativeness compared to single class shares (Francis, Schipper, and Vincent 2005). Governance associated with board structure is positively associated with voluntary disclosure (Ajinkya, Bhorjraj, and Sengupta 2005; Karamanou and Vafeas 2005). Lastly, Hope and Thomas (2008) find that companies with substantial foreign operations that disclose geographical earnings outperform their non-disclosure counterparts.

However, increasing discretionary disclosure is costly, not only in terms of resources, but also in terms of revealing proprietary information about the firm (Jovanovic 1982; Verrrecchia 1983). Managers that are exposed to a greater threat of takeover might intentionally reduce firm transparency to deter the potential for a takeover, essentially creating their own “anti-takeover” provision. Greater opaqueness of a firm’s financial situation has the ability to reduce takeover probabilities (Shleifer and Vishny 1989; Edlin and Stiglitz 1995). Therefore, an alternative hypothesis is that corporate governance and discretionary disclosure are substitutes, and oil and gas companies with weaker shareholder protection are more likely to provide voluntary disclosure.

The hypothesis that disclosure and governance are substitutes also finds support in the literature. Companies with greater financial analyst coverage are less likely to hold open conference calls (Tasker 1998; Bushee, Matsumoto, and Miller 2003). Family firms can be more susceptible to governance issues. However, family firms tend to provide not only higher quality earnings announcements (Ali, Chen, and Radharishnan 2007), but also more transparent earning warnings (Chen, Chen, and Cheng 2008). Armstrong, Balakrishnan, and Cohen (2012) study the informativeness of financial disclosures and find evidence that financial transparency (i.e., mandatory disclosure) increases when a state adopts an antitakeover law. Finally, Zhao, Allen, and Hasan (2013) investigate state antitakeover laws and disclosure using the AIMR ratings and find evidence that firms in states with greater takeover protection have higher ratings. Unfortunately, the AIMR data is only available through 1995 and is a measure created by analysts that incorporates both mandatory and voluntary disclosure. Thus, the extant literature also provides support for the substitute hypothesis. Therefore in sum, the collective body of literature on the topic is divided on the question of whether disclosure and governance are complements or substitutes.

III. Sample and Research Design

i. Sample and Data

Utilizing a Factiva guided search, I hand-collect oil and gas firm public disclosures related to changes in hedging policies.[12] The announcement sample period spans between January 1991 and January 2013. Disclosures include hedging program initiations, closures, and changes. I identify the sample as companies that are classified by Compustat as being in the oil and natural gas industry (SIC=1311), that are linked between CRSP and Compustat, and that have total assets greater than zero reported by Compustat. These constraints result in an initial sample of 103 oil and gas firms disclosing 490 changes in hedging policy announcements. The remaining oil and gas firms, to the best of my knowledge, do not voluntarily disclose any changes to hedging policies.

More stringent disclosure and accounting regulations were enacted between 1999 and 2001, which affect the sample period. One example is the Statement of Financial

[12] I include numerous sources such as Business Wire, Dow-Jones Newswires, PR Newswires, Reuters news, The Wall Street Journal, among other Major English Dailies in the United States.

Accounting Standards No. 133 (SFAS 133). These regulations provide shareholders with greater transparency regarding corporate risk management practices, specifically the use of derivative instruments. Unsurprisingly, there are more announcements in the post-2000 period. The sample consists of considerably more hedging disclosures pertaining to increases (n=471) than decreases (n=19). Figure 1 provides a visual timeline of the hedging announcements along with natural gas and oil commodity prices.

[Place Figure 1 about here]

Beyond collecting the disclosure date, direction, and commodity type (crude oil or natural gas), I collect other descriptive components of the announcements. The timing of the changes in hedging is categorized as *ex ante* or *ex post* based on whether the change was announced before or after its implementation. I identify a disclosure as *Market View* when the announcement explicitly states that the change in hedging policy is based on expectations of future commodity prices. In contrast, hedging change disclosures associated with debt covenants typically are devoid of market views (Beatty, Chen, and Zhang 2008) and therefore are characterized as *Bank Loans*. The remaining events are categorized as *Others*. Furthermore, I search for other firm-specific news surrounding the date of disclosure (-1 and +1) in the Factiva database. Announcements are considered to be *Contemporaneous* when the related firm has other news and events within the announcement window, and as *Non-Contemporaneous* otherwise. Table 1 provides descriptive details for the entire sample of hedging disclosures. The sample includes a total of 490 hedging announcements, with 201 oil and 289 natural gas disclosures.

[Place Table 1 about here]

In order to identify oil and gas firms that engage in hedging activities for a particular year, I use hand-collected financial derivatives positions and operational hedging contracts using 10-K filings disclosed on Edgar. Identifying which firms make changes in hedging activity is important for analysis, as companies that do not make changes to their hedging policies would not have the justification to voluntarily disclose any changes in their hedging program.

Data from the 10-K filings is used in the calculation of the hedge ratio for each firm. This calculated hedge ratio is used to define one of the variables I consider for voluntary disclosure. These type of hedging positions are typically reported in the 10-K under "Item 7A. Quantitative and Qualitative Disclosures about Market Risk." Firms in the oil and gas industry tend to provide oil and gas derivative contracts details clearly in this part of their annual report, with most providing tables with exact volumes, maturities, and price points. This detailed data allows for the collection of the contract type (call, put, forward, future, swap, etc.), the maturity of the contracts, volume sold (reported on a per day basis, monthly basis, or aggregate amount for the period of the contract), commodity type (oil or gas), and agreed upon price(s) of the position. Throughout the data collection effort, I focus only on directional contract positions and disregard positions such as basis spreads and other non-directional positions.[13] Volatility and future prices for all types of oil and gas commodities are retrieved from Bloomberg to calculate the delta for each of the hedge positions. Deltas for linear contracts (such as loans, forwards, futures, swaps,

[13] I follow Jin and Jorion (2006) and Bakke, Mahmudi, Fernando, and Salas (2015) by disregarding the non-directional hedge positions for calculating hedge ratios.

etc.) are assumed to be a value of 1. For option contract deltas, I use the Black and Scholes delta to estimate sensitivity of the position to movements in oil and gas prices.[14]

ii. Measures of Voluntary Disclosure

Given the difficulty of measuring voluntary disclosure and the lack of consensus in the literature, I use four different measures for my analysis. Two of these measures have been used previously in the literature, specifically in the context of management forecasts.[15] The first measure, *DISC-Binary*, is a binary variable that receives a value of 1 if firm *i* in time *t* provides a change in hedging announcement, and 0 otherwise. The second measure, *DISC-Count*, is simply the number of disclosures that firm *i* in time *t* provides the market. The next measure, *DISC-Ratio*, is a novel variable. This measure is defined as the number of disclosures that firm *i* in time *t* provides the market divided by the total number of disclosures for the entire oil and gas industry in year *t*. The final measure, *DISC-Transparency*, is calculated as the number of disclosures that firm *i* in time *t* makes divided by the time series volatility of hedge ratio changes for firm *i* during the announcement sample period.[16] If the firm does not make an announcement during time *t,* then the value is set to 0. Utilizing several measures allows me to improve the credibility of the analysis and any findings are not highly dependent on the disclosure variable. Variable definitions are provided in Appendix A.

[14] For further details on the calculations on hedge ratios, please see Tufano (1996), Jin and Jorion (2006), and Bakke, Mahmudi, Fernando, and Salas (2015).

[15] For example, Sengupta and Zhang (2015), use a binary and count measure variable for management forecasts.

[16] Throughout the paper, the hedge ratio used for this disclosure measure is based upon the expected production one-year ahead in accordance with Tufano (1996). I also alter this variable by calculating the hedge ratio based upon reserves in accordance with Jin and Jorion (2006). The results are qualitatively similar and for brevity I do not report.

iii. *Measures of Governance*

I employ commonly used measures of corporate governance from the finance literature to test my empirical predictions. These measures are explained in detail in Gompers, Ishii, and Metrick (2003), Cremers and Nair (2005), and Bebchuk, Cohen, and Ferrell (2009). These authors show that governance has the ability to affect firm value. My study focuses on these governance measures to provide insight into the effect of corporate governance on voluntary disclosure.

Specifically, I investigate three measures of governance based on the degree of managerial entrenchment whose definitions are based upon data from RiskMetrics (formerly the Investor Responsibility Research Center, IRRC). The first measure, the *G-Index*, as created by Gompers, Ishii, and Metrick (2003), creates a cumulative index score based the number of antitakeover provisions included in a firm's charter along with the legal specification of the state where the company is incorporated. This measure takes a value between 0 and 24, where the greater the value the more inferior the governance of the firm is based on the index.[17] The *G-Index* provides a good starting point for my analysis as a corporate governance measure since it's the most comprehensive of the three measures I employ.

The second measure of governance that I construct and utilize, the *ATI*, is from Cremers and Nair (2005). Their measure is constructed as an alternative takeover index (*ATI*) and consists of three antitakeover provisions. The last governance measure I

[17] Data for the *G-Index* are available approximately every two years up until 2006. Unfortunately, when RiskMetrics acquired IRRC, the data collection process was revamped and some of the components are no longer available as a result; therefore, I am unable to calculate this index beyond 2006. The specific years available for the *G-Index* are 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006.

construct, the *E-Index*, is based on the findings of Bebchuk, Cohen, and Ferrell (2009), who emphasize six of the twenty four measures of the *G-Index*. Bebchuk and coauthors show that these six measures have the greatest impact on firm value. These measures of governance are central to my analysis as the necessary data are still collected by RiskMetrics (formerly IRRC).[18]

iv. Other Measures

Finally, I obtain data from RiskMetrics (formerly IRRC), I/B/E/S, Compustat, and CRSP to define other relevant variables. Prior literature has demonstrated that each of these variables are related to discretionary disclosure practices. These variables include board independence (*BDIND*), board size (*BDSIZE*), the number of analysts covering the firm (*AC*), and information asymmetry proxied for by analyst forecast dispersion (*DISP*) and return volatility (*RVOL*). To model the probability that a firm makes a change in their hedging program, I use the measures of *Leverage*, *MTB*, *Size*, tax loss carry forwards (*TLCF*), foreign tax credits (*TXFO*), and quick ratio (*QR*).[19] The last firm control variable I include is return on assets (*ROA*).

v. Research Design

Investigation of the systematic differences in governance between companies that voluntarily disclose hedging changes, and those that do not, is based on a sample of oil

[18] I calculate the *E-Index* from raw data reported by RiskMetrics (formerly IRRC) throughout the analysis and following the acquisition the data have become available on a yearly basis. As a robustness check, I also use the data directly from the authors available from: http://www.law.harvard.edu/faculty/bebchuk/data.shtml.

[19] I follow Mian (1996) and Tufano (1996) for the variable definitions of hedging determinants.

and gas producing firms (SIC code-1311) during the sample period of 1991 to 2013. SIC 1311 entities primarily focus on the exploration and extraction of crude petroleum and natural gas. These companies provide an ideal setting to study the differences in governance and discretionary disclosures as they tend to be quite uniform in their exposure to commodity prices and engage in comparable hedging policies.[20] These similarities across firms within the industry help to mitigate the econometric issues of omitted variable bias and/or spurious correlations that would be more prevalent in a study that incorporates numerous industries or focuses on a complex, multifaceted industry. The SIC 1311 definition is specific to the subgroup of energy firms that engage in the exploration and production of oil and natural gas. It excludes several of the larger, more widely known, oil companies that are much more vertically integrated and typically classified under the heading of "petroleum refining" and the SIC code 2911.[21] SIC 1311 firms are naturally less hedged than these counterparts. Thus, these firms have greater exposure to commodity prices as pure-play entities.

It is often difficult to identify derivative contract-specific information for commodity positions of public U.S. corporations (Purnanandam 2008). Oil and gas firms provide transparent derivative positions to the public through their annual filings. Specifically, these companies provide comprehensive information relevant to each commodity derivative position. This detailed information includes the notional volume, type of contract, the underlying commodity, and maturity of the contract. Due to the

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[20] See Jin and Jorion (2006).

[21] SIC 2911 firms include companies such as British Petroleum, Chevron, Exxon Mobil, and Shell.

availability of detailed hedge positions, data from SIC 1311 firms has provided the foundation for numerous empirical studies.[22]

I begin testing my empirical hypotheses using the following regression specification:

$$DISC_{i,t} = \alpha + \beta_1 GOV_{i,t-1} + \gamma X_{i,t-1} + \varepsilon_{i,t-1} \quad (1)$$

where: $DISC_{i,t}$ is one of the four measures of discretionary disclosure; $GOV_{i,t-1}$ is one of the three corporate governance indices; and $X_{i,t-1}$ is a matrix of control variables. Since a higher governance index value indicates fewer shareholder protection provisions, evidence that disclosure and governance are complements would be supported by a negative β_1. Support for the conclusion that disclosure and governance are substitutes would be established by a positive β_1.

The specification of Equation (1) is similar to many used in the extant discretionary disclosure literature. However, this model is subject to possible selection bias as firms who do not make changes to their hedging program have no reason to announce changes in their hedging activities. Studying discretionary disclosure and governance in the oil and gas industry allows for the ability to delineate between the three types of firms for a particular year: (a) firms that make changes in their hedging program and voluntarily disclose them, (b) firms that make changes in their hedging program but do not voluntarily disclose changes in hedging policy, and (c) firms that do not make changes in their hedging program or hedge and therefore do not disclose changes in hedging. The ability to differentiate between firm type each year helps to minimize any potential bias.

[22] These include Rajgopal and Shevlin (2002), Jin and Jorion (2006), Kumar and Rabinovitch (2013), Bakke, Mahmudi, Fernando, and Salas (2015), among others. The applicability of findings specifically for the oil and gas industry to a broader, more diverse set of industries is confirmed by Knopf, Nam, and Thornton (2002).

An alternative method for estimating the differences in governance between companies that voluntarily disclose hedging transactions and those that do not involves modeling the two successive decisions associated with disclosure: (a) make changes in their hedge program or not; and (b) conditional on the decision to make changes in their hedging activities, provide discretionary disclosure or not. Accordingly, I use a Heckman (1979) two-step model to estimate this two-stage decision process of making a voluntary hedging disclosure. In the first stage, I estimate a logit regression to model the likelihood that firm *i* makes a change in hedging policies in year *t*. I use the following specification to model this decision:

$$PROB(\Delta HedgeRatio_{i,t} = 1) = \alpha + \beta_1 Leverage_{i,t-1} + \beta_2 MTB_{i,t-1} + \beta_3 QR_{i,t-1} + \beta_4 Size_{i,t-1} + \beta_5 TLCF_{i,t-1} + \beta_6 TXFO_{i,t-1} + \varepsilon_{i,t-1} \quad (2)$$

where: $Leverage_{i,t-1}$ is the firm's leverage; $MTB_{i,t-1}$ is the market-to-book ratio of the firm; $QR_{i,t-1}$ is the firm's quick ratio; $Size_{i,t-1}$ is the size of the firm; $TLCF_{i,t-1}$ is a measure of the firm's tax loss carry forwards; and $TXFO_{i,t-1}$ is the firm's foreign tax credits. Using the first stage results, I compute an Inverse Mills ratio to be included in the second stage that models the firm's decision to announce changes in hedging policies.

The first stage regression uses four instrumental variables to mitigate the potential selection bias associated with the choice to make changes in hedging activities and to study the governance determinants of a voluntary announcement of changes in hedging. The four instruments are $Leverage$, QR, $TLCF$, and $TXFO$. An important requirement of any instrumental variable is exclusivity. In the current setting, this requirement dictates that the likelihood of voluntary disclosure should only be affected by the instrumental variables through the likelihood of a firm making changes to their hedging program. The extant literature supports these as economic determinants of hedging but not determinants for discretionary disclosure, thus meeting the exclusivity requirement.

Following the first stage of estimation, to be included in the second stage, the firm must have recorded a change in hedge ratio for the year. The second stage regression of the Heckman two-step regression is modeled as the following:

$$DISC_{i,t} = \alpha + \beta_1 GOV_{i,t-1} + \gamma X_{i,t-1} + \beta_i InverseMills_{i,t-1} + \varepsilon_{i,t-1} \quad (3)$$

where: $DISC_{i,t}$ is one of the four measures of discretionary disclosure; $GOV_{i,t-1}$ is one of the three corporate governance indices; and $X_{i,t-1}$ is a matrix of control variables.

IV. Results

Summary statistics of all variables used throughout the remaining regression analyses are reported in Table 2. I winsorize the top and bottom 5 percent of all continuous variables to minimize the impact of outliers. To finalize the sample, I restrict the data to include information for all independent variables and dependent variables in the main portion of the analysis, which results in 417 firm-year observations. Panel A provides the descriptive statistics for the sample in its entirety. Approximately 17 percent of the firm-year observations (n = 70) make at least one voluntary disclosure. The table shows the median (mean) governance scores of 2 (2.2278), 2 (2.2806), and 9 (9.4349), respectively for the *ATI*, *E-Index*, and *G-Index*.

[Place Table 2 about here]

Panel B of Table 2 reports means, medians, and tests for differences for the sub-samples of oil and gas firms. The first group includes companies that either do not make changes in hedging or do not have a hedge ratio, and accordingly do not have any announcements. The second group are firms that have changes in their hedge ratios but do not disclose the changes during a given year. The final group are oil and gas companies that change their hedging activities and provide discretionary disclosure. Governance as measured by the *E-Index* is significantly different among all three groups, with non-announcing and non-hedging firms averaging less than two provisions and the groups that experience changes in hedging averaging more than two. The initial evidence supports corporate governance and discretionary disclosure being substitutes.

Relative to the two groups that do not make any hedging disclosures, firms that make discretionary announcements on average are more likely to have less than 60% of their board classified as independent directors. Disclosing companies on average have greater information asymmetry, as proxied by *RVOL*, the year prior to disclosing, than the other two non-disclosing sub-samples. These univariate findings provide support for governance and discretionary disclosure being substitutes.

i. Determinants of Hedging Announcements

Initially, I include the entire sample of 1311 SIC companies in a lead-lag regression analysis that incorporates the measures of disclosures as the dependent variable. I employ four different regression methodologies to account for the nature of the dependent variable: (a) *DISC-Binary* is a binary variable and estimated using logit regressions, (b) *DISC-Count* is a count variable and estimated via Poisson regressions, (c) *DISC-Ratio* is a variable that can range from zero to one and estimated using a fractional logit regression, and (d) *DISC-Transparency* is a measure of the firm's transparency and is censored at zero, thus measured via a Tobit regression with a lower limit of zero. The first independent variable of interest is the classic measure of corporate governance, *G-Index*.[23] These results are presented in Panel A of Table 3.

[Place Table 3 about here]

The results presented in Panel A strongly support the hypothesis that corporate governance and discretionary disclosure are substitutes. First, the *G-Index* is positively related to the probability of an announced change in the hedging program across all specifications at the 0.01 level, bearing in mind that the higher the governance index, the fewer the number of shareholder protection rights. The positive coefficients for *G-Index* explain that, when the marginal firm increases the number of provisions by one unit, the firm is 2.83% more likely to provide discretionary disclosures.

However, these regressions might be subject to the sample selection bias described previously as the sample includes three distinct groups. The results in Panel A could be just picking up the differences in the *G-Index* between the disclosure group and the group that does not have a hedge ratio or a change in hedge ratio. Accordingly, I model for this potential bias using a two-stage process (Heckman 1979). Results of this analysis are presented in Panel B. The first stage (column 1) models the firm's propensity to engage in changes in hedging activity for the year of interest. The instrumental variables to address the sample selection bias are suggested as determinants of hedging by Tufano (1996) and Mian (1996). The second stage models the firm's decision to voluntarily disclose changes in year *t* and is contingent on the firm having a change in hedge ratio in year *t* (columns 3, 5, 7, and 9). After correcting for this potential bias, the

[23] The *G-Index* is a value between 0 and 24 based on various antitakeover provisions. For an in-depth review, please see Gompers, Ishii, and Metrick (2003).

results remain and are stronger in magnitude, supporting the hypothesis that corporate governance and discretionary disclosure are substitutes.

Results from Panel B further reveal that board independence, *BDIND*, tends to be negatively associated with the disclosure measures. The marginal firm with more than 60% of the board comprised of independent directors is approximately 20% less likely to disclose changes in hedging. This finding is consistent with governance and disclosure being substitutes. Collectively, Table 3 provides evidence that the *G-Index* and discretionary disclosure are substitutes.[24]

ii. Further Analysis

One potential concern for the results from Table 3 is that the *G-Index* is only available up until 2006. It is plausible that the results in Table 3 are time-period specific. Thus, the previous findings may no longer be applicable as determinants of discretionary disclosure. I address this issue by changing the governance measure from the *G-Index* to the *E-Index.* The *E-Index* is a more succinct measure of corporate governance and the data extends beyond 2006.

The *E-Index* is comprised of six of the twenty four provisions from the *G-Index*. Bebchuk, Cohen, and Ferrel (2009) extensively investigate the individual provisions of the *G-Index* and find that only six of the provisions provide any economically significant reductions in firm value during the period from 1991 to 2003. Given the relevance of these particular provisions and the improved data availability, I replicate the previous

[24] I use the *G-Index* as reported by RiskMetrics (formerly IRRC) throughout the analysis. As a robustness check, I use the data directly available from the authors at http://faculty.som.yale.edu/andrewmetrick/data.html and additionally calculate the measure manually from the database. My findings remain unchanged.

analysis using the *E-Index* in Table 4.[25] For brevity and issues of bias discussed previously, I do not replicate Panel A.

[Place Table 4 about here]

Focusing on the second-stage of the two-stage Heckman (1979) selection process, there is clear evidence that discretionary disclosures and corporate governance, as proxied by the *E-Index*, are substitutes.[26] All model specifications yield positively significant results at the 0.01 level and marginal effects that are approximately the same as those reported in Table 3. This finding supports the notion that disclosure and governance are substitutes and is consistent with Bebchuk, Cohen, and Ferrrell (2009), who conjecture that a more precise index of provisions is appropriate.

Table 4 warrants further discussion regarding various covariates. Relative to the *G-Index* findings, there is evidence that the level of financial analyst coverage, *AC*, is a determinant in the disclosure policies for oil and gas companies. *AC* is consistently positive across the models and highly significant in three of the four specifications. This positive relationship suggests that certain measures of governance are complements for disclosure and is consistent with the findings in Chen, Chen, and Cheng (2008) and Sengupta and Zhang (2015). The positive association contrasts with Tasker (1998) and Bushee, Matsumoto, and Miller (2003), who find firms with greater analyst coverage are less likely to provide other measures of discretionary disclosure. Conversely, *BDIND* is significantly negative across all specifications and reinforces the previous results. The

[25] The *E-Index* is a value between 0 and 6 based on a subset of specific antitakeover provisions used in the *G-Index*. For an in-depth review, please see Bebchuk, Cohen, and Ferrell (2009).

[26] I calculate the *E-Index* from the RiskMetrics (formerly IRRC) database throughout the paper. As a robustness check, I verify my findings using the data directly provided by the authors available at http://www.law.harvard.edu/faculty/bebchuk/data.shtml. I do not use their data in the paper as it is only available for the period of 1990 through 2006.

increase in board independence actually leads to a reduction in the probability of discretionary announcements, consistent with governance and disclosure being substitutes. Table 4 provides the first evidence that *Size* is related to the probability to disclose changes in hedging activities by SIC 1311 companies. Specifically, *Size* negatively impacts the informational environment of the firm. The main takeaway in using the *E-Index* is that there is further evidence that corporate governance and discretionary disclosure are substitutes.

The evidence thus far suggests the possibility that any antitakeover provision and any combination of the provisions might lead to an increase in a firm's discretionary disclosure. To investigate this likelihood, the *ATI* proposed by Cremers and Nair (2005) is a suitable measure as it shares only three provisions of the *G-Index* and one from the *E-Index*. I replicate previous regression analyses using the *ATI*. Interestingly, in Table 5, there is no evidence that the *ATI* is a determinant of voluntary disclosure for oil and gas companies. Table 5 suggests that the provisions are not exchangeable with regard to their impact on the corporate information environment. Consistent with Table 4, *Size* (*AC*) is negatively (positively) associated with the firm's discretionary disclosures.

[Place Table 5 about here]

To this point in the analysis, I have disregarded the role of institutional investors on a firm's information environment. Investors often invest in oil and gas companies as a proxy for investing directly in the commodities. Changes in hedging alter a firm's stock price exposure to changes in oil and gas price (Tufano 1998). As investors differentiate between firms based on hedging policies, changes in hedging activities should be important for shareholders, especially large institutional investors. Increases in the level of institutional ownership of a firm are associated with greater levels of voluntary disclosure (Healy, Hutton, and Palepu 1999; Bushee and Noe 2000). However, evidence exists that firms are less likely to engage in discretionary disclosure as institutional holdings become more concentrated (Ajinkya, Bhojraj, and Sengupta 2005; Karamanou and Vafeas 2005). It is plausible that the measures of governance were serving as proxies for institutional ownership and that incorporating this variable into the analysis will affect the evidence in favor of corporate governance and disclosure being substitutes.

I address this possibility by incorporating *INST* as an additional covariate in the previous regression analyses. For brevity, I report only the second stage regression coefficients and p-values in Table 6. There is evidence that firms with greater institutional ownership increase disclosure policies of oil and gas firms that make changes in hedging policies.[27] The *G-Index* and *E-Index* continue to provide strong support that corporate governance and disclosure are substitutes.

[Place Table 6 about here]

The inclusion of *INST* provides valuable insight into the covariates beyond the variables of interest. *Size* is now a significant negative for all disclosure measures across all models.[28] The interpretation of these results is ambiguous; larger firms are less likely to disclose hedging announcements, but on average there is more information concerning large firms in the market and *Size* is also associated with greater analyst coverage (Barth, Kasznik, and McNichols 2001). This finding contrasts with the positive result for *AC*, as an increase in analyst coverage increases the probability of discretionary announcements.

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[27] I replace the institutional ownership variable with a continuous level of ownership and find similar results.
[28] Previously, *Size* was insignificant in the models utilizing the *G-Index* as the governance measure.

Finally, *BDIND* continues to be negative and provides supporting evidence that is consistent with governance and disclosure being substitutes.

The hypothesis that corporate governance and discretionary disclosure are substitutes has been substantiated up to this point, providing evidence that firms with fewer shareholder protection provisions are more apt to voluntarily disclose information concerning changes in hedging positions. However, it is not clear why more entrenched firms (i.e., firms with fewer shareholder protection rights) would be willing to disclose this additional information. Hermalin and Weisbach (2007) provide a theoretical framework incorporating the costs and benefits of increased transparency. Accordingly, firms weigh the costs and benefits of discretionary disclosures to arrive at an optimal level of disclosure. In this situation, it is plausible that the costs of not disclosing changes in hedging for firms with fewer shareholder protection provisions outweigh the benefits of non-disclosure.

Testing what can entice these firms to disclose is of importance. Healy, Hutton, and Palepu (1999) and Bushee and Noe (2000), provide evidence that increases in institutional ownership are positively related to disclosure levels. This foundation suggests that institutional ownership may have the ability to influence disclosure policy by applying pressure on management. One would then expect to find that higher levels of institutional holding should have differential effects on the firm's disclosure policies relative to the governance of the firm. To further substantiate that disclosure and corporate governance are substitutes, there should be evidence that greater institutional ownership in low governance firms (i.e., higher levels of the *E-Index*) should exhibit a positive relation regarding discretionary disclosures. This institutional ownership effect should be either non-existent or negative for high governance firms (i.e., lower scores of the *E-Index*). Accordingly, I divide the sample into two groups based on the median of the *E-Index* and run the previous regressions in Table 7 on the two sub-samples.

[Place Table 7 about here]

Columns 1 through 4 report the second stage of the Heckman analysis for firms with greater shareholder protection provisions. *INST* is consistently negative and significant in one of the models. Columns 5 through 8 provide the analysis for firms with fewer shareholder protection provisions. This sub-sample provides supporting evidence that higher institutional ownership can positively impact discretionary disclosures of poorly governed firms.

Another possibility that would explain the support for disclosure and corporate governance being substitutes is that the level of governance subsequently changes following a firm's initial discretionary disclosure. In short, firms may begin disclosing changes in their hedging program and follow that by changing the number of shareholder provisions adopted by the firm. The firm continues to disclose leading to our previous findings. To investigate this possibility, I use a change regression to regress the change in governance levels on an indicator variable for the first time the firm voluntarily announced a change in hedging activity. The lack of significance of the initial disclosure indicator in Table 8 helps to minimize this concern.

[Place Table 8 about here]

Finally, specific provisions may differentially impact the disclosure policies for SIC 1311 firms that make changes in their hedging positions. Bebchuk, Cohen, and Ferrrel (2009) identify the six provisions, i.e., the *E-Index,* that have the ability to significantly influence firm value. Appropriately, I do not make predictions on the signs or significance of the individual provisions on the disclosure policy of the company. I replicate Table 4 with the six provisions of the *E-Index* in place of the *E-Index* value. As Table 9 indicates, provisions that limit shareholders' ability to amend bylaws, require more than a majority to approve a merger, and provide management with golden parachutes increase the probability that firms will make disclosure announcements. There is also marginal evidence that firms where shareholders have limited ability to amend the corporate charter experience a negative impact on the disclosure environment.

[Place Table 9 about here]

The results throughout provide support for corporate governance and discretionary disclosures being substitutes. Specifically, firms with fewer shareholder protection provisions (higher levels of the *G-Index* and *E-Index*) are more likely to voluntarily disclose changes in their hedging program. I provide empirical evidence against the possibility of sample selection bias and reverse causality/correlation. I also provide evidence that various shareholder provisions have differential effects, as well as support for institutional ownership having the ability to exert pressure on management and impact the information environment of the firm. Collectively, the findings suggest corporate governance and discretionary disclosure are substitutes.

V. Conclusion

Previous studies document that governance measures have the ability to influence a firm's information environment. The extant literature fails to arrive at a consensus among various measures of governance and over whether the measures complement or substitute for discretionary disclosure. In this study, I investigate whether the voluntary disclosures made by SIC 1311 companies are complements or substitutes to the existing governance levels of the firms. The voluntary disclosure measures are constructed using a hand-collected sample of 490 announcements of changes in hedging policies made by oil and gas companies between January 1991 and January 2013. This particular data allows me to control for sample selection bias and omitted variable bias due to heterogeneity between complex industries while understanding how governance impacts the firm's voluntary disclosure.

The findings in this paper reveal novel evidence regarding the relationship between corporate governance and firm disclosure policies. Specifically, I find overwhelming evidence that firms with fewer shareholder protection rights have a positive relationship with the discretionary disclosure of hedging announcements within the oil and gas industry. This finding is robust in the analysis for the *G-Index* and *E-Index* but not for the *ATI*, indicating there are differential effects between provisions. There is also evidence that institutional investors exact pressure on firms with relatively poor governance to increase disclosure. Evidence throughout indicates that firms with fewer shareholder protection rights are not only more likely to disclose changes to their hedging practices but also provide more of them. Furthermore, the interaction between institutional ownership and shareholder provisions have ramifications for firm disclosure policies.

My findings contribute to the literature by providing evidence that the corporate governance of a firm is related to a firm's disclosure environment. The evidence suggests that firms are aware of the perceived costs and benefits of voluntary disclosure. For oil and gas companies with poor governance relative to industry peers, the evidence strongly supports the notion that benefits of disclosing hedging activities greatly outweigh any potential costs. The inferences of this study extend far beyond the oil and gas industry since the relationship between corporate governance and discretionary disclosure is pertinent across the corporate world, especially given the extensive prevalence of hedging activities associated with commodity, currency, interest rate, and other risk exposures.

Chapter 2:

Is Good News for a Firm also Good News for a Nearby Firm? Geography and Comovement of Stock Returns[29]

I. Introduction

Previous studies show that comovement in stock returns cannot be fully explained by common economic factors (Barberis and Shleifer 2003; Barberis, Shleifer, and Wurgler 2005; Kumar and Lee 2006; Pirinsky and Wang 2006). While these studies provide valuable insights on how investors behave, there is still a limited understanding on the channels through which investors incorporate seemingly unrelated news into stock prices. This paper helps fill the void in the literature by examining the effects of good news of a company on firms that do not have correlated cash flows while sharing a similar investor base. Specifically we examine how a firm's dividend initiation announcement (positive news) influences stock prices of seemingly unrelated firms.

A priori, it is not clear that positive news of a firm would affect stock prices of seemingly unrelated firms in absence of correlated cash flows or risks. It is possible that individual investors may not use these news announcements in assessing the value of unrelated firms, such that the effect of positive news is restricted to the equity value of the news creating firm and does not affect seemingly unrelated firms. Alternatively the news announcement may serve as an attention-grabbing event and result in positive spillover effects for seemingly unrelated firms amongst investor clientele. Individual investors have a documented tendency to invest in firms that are established locally

[29] This chapter is based on collaborative work with Vahap B. Uysal.

(Coval and Moskowitz 1999, 2001; Huberman 2001; Hong, Kubik, and Stein 2005, 2008). Limited resources (DellaVigna and Pollet 2009) and "coarse thinking" (Massa and Zhang 2009) may lead investors to place a greater value on a particular group of firms (e.g., dividend paying companies) based on their affiliation with the news generating firm (e.g., dividend initiation). Thus, a release of positive news, which attracts a local individual investor clientele (e.g., senior citizens), may cause the underlying clientele of investors to favorably view non-news generating firms that are in the same group as the positive news-generating firm. This new association may lead to a spillover of positive news announcement, generating an increase in the stock prices of seemingly unrelated firms in the presence of a large investor clientele (positive-investor-attention hypothesis).

The positive news may be at the expense of seemingly unrelated firms without any news announcements. Specifically, firms compete for the investor attention (Hirshleifer, Lim, and Teoh 2009) and firms with news announcements tend to capture considerable attention from individual investors (Barber and Odean 2008). Limited resources confine the ability of individual investors to process relevant stock market information (DellaVigna and Pollet 2009). In response, individual investors attempt to efficiently allocate their available resources and shift their focus to firms that are generating positive news in the market. This in turn may generate an adjustment in their portfolios: selling or not buying non-news generating firms while purchasing positive news generating firms in the same group. Thus, the shift in attention may generate an unfavorable market reaction for the seemingly unrelated firms (investor-distraction hypothesis).

We test the aforementioned hypotheses by assessing the impact that similar investor clientele has on the stock prices of seemingly unrelated dividend paying and non-dividend paying firms in response to a dividend initiation of a firm located within the same metropolitan statistical area (MSA). Specifically, we define observations as seemingly unrelated firms, if the firms are located in the same MSA, but are categorized in a different industry as the news creating firm. Prior studies have documented that dividend initiation announcements generate positive abnormal returns (Asquith and Mullins 1983; Healy and Palupu 1988; Michaely, Thaler, and Womack 1995) and attract considerable investor attention (Barber and Odean 2008). Thus, we employ dividend initiations as positive news for this study. By focusing on dividend initiations, we are able to clearly identify the avenue in which a news generating firm influences stock prices of seemingly unrelated firms in the presence of a specific investor clientele for the underlying firms.

Dividend paying and non-paying firms constitute differing clientele bases (Bell and Jenkinson 2002). Especially, senior citizens form an important clientele for dividend paying firms and have correlated trades which can influence stock prices (Graham and Kumar 2006). Geographical location also generates investor clienteles. Specifically, Coval and Moskowitz (1999) show that investors tend to invest locally. Combined with the studies on dividends, these studies suggest that senior citizens should invest in the stocks of dividend paying companies located within the same MSA; thereby, forming a geographically segmented investor clientele. To ensure that our results are not driven by correlated cash flows of firms in the same industry, we exclude firms from the same industry grouping in the same MSA as the dividend initiating firm. This empirical design also allows us to assess the effect of news of a firm on other firms that do not have correlated cash flows, but share a similar investor clientele.

The findings in this paper reveal novel evidence on the comovement of stock returns. Specifically, after accounting for firm characteristics and common macroeconomic shocks in a region, we find that seemingly unrelated firms in an MSA receive a favorable market reaction of 40 basis points when there is a high percentage of senior citizen population in the MSA. The positive reaction results are found specifically for dividend paying firms, while non-dividend payers do not experience a significant impact. Collectively, these findings are consistent with the positive-investor-attention hypothesis as firms' equity prices are benefiting from an investor clientele of senior citizens, who incorporate the positive news into all dividend paying firms located in the area.

We take further steps to examine robustness of the findings. The results of the paper are robust to several model specifications and numerous relatedness classifications including Hoberg and Phillips Text-based Network Industry Classifications (Hoberg and Phillips 2010a, 2010b). We also run separate regressions for mean variables both at the dividend initiation announcements and at the MSA levels. The results remain intact for the sub-sample of seemingly unrelated dividend paying firms in MSAs with a relatively high proportion of senior citizens. However, non-dividend payers did not receive a significant market reaction from the news. We also examine the effect of investor concentration on our findings. As the hypotheses are implicitly built upon the irrational behavior of individual investors, the findings should be prominent in the presence of low institutional ownership. We investigate this notion by interacting the senior citizen variable with high and low institutional holding. Our results reveal that dividend paying firms in areas with high senior citizen concentration receive positive market reaction only if there is low institutional ownership.

We further examine alternative economic hypotheses that may explain our findings. First, the positive market reaction for dividend paying firms located within areas with a high percentage of senior citizens might be an effect that all dividend paying firms experience similar reactions. We are able to dispel this notion as seemingly unrelated firms located outside of the MSA of the initiating firm did not experience a significant shock to their equity prices. Second, the supply of dividend payers in the MSA at the time of the announcement may be the reason for the findings. Specifically, few dividend paying firms in an MSA may generate the findings of the paper if these firms are located in areas with high percentage of senior citizens. Upon introducing the number of dividend paying firms, at the time of the dividend initiation in the MSA in the analysis, the findings of the paper are unaffected. Third, the positive market reactions to seemingly unrelated dividend paying firms may be attributed to the expectation of these firms to increase their own payout policy following the dividend initiation. However, dividend paying firms do not subsequently increase dividend payout following a firm initiating a dividend in the same MSA. Finally, seemingly unrelated dividend paying firms may experience an increase in their cash flows subsequent to the dividend initiation in the same MSA. We do not find supporting evidence for this hypothesis either. Collectively, these findings are not fully consistent with the alternative hypotheses and lend further support to the positive-investor attention hypothesis.

This paper relates to studies examining the comovement of stock returns. Pirinsky and Wang (2006) find that comovement of stock returns in an MSA cannot be fully explained by firm fundamentals. By reporting that high percentage of senior citizens influence market reactions to seemingly unrelated firms in the same MSA, the paper suggests regional investor clientele as a channel through which the comovement of stock returns can transpire. Furthermore, we contribute to the literature that investigates the implications of a firm's location on stock returns. Local investors tend to invest more heavily in local companies and have the ability to impact the equity prices (Ivkovic and Weisbenner 2005; Hong, Kubik, and Stein 2008). The findings in this paper suggest that the ability of the demographic composition surrounding the firm to influence stock returns depends on the match between local investor clientele and firm characteristics.

Our paper is also related to previous studies that examine the effects of investor psychology. Investors do not always act rationally when incorporating news announcements and analyzing a firm's fundamentals (Daniel, Hirshleifer, and Subrahmanyam 1998; Dong, Hirshleifer, Richardson, and Teoh 2006; Hirshleifer, Hou, Teoh, and Zhang 2004; Hirshleifer, Lim, and Teoh 2009; Hirshleifer and Teoh 2003). Our findings in the paper contribute to these studies by not only documenting evidence that the local demographics of a firm engage in coarse thinking but that their behavior is directional. Investors direct their attention positively towards the new group of firms associated with the positive news generating firm. Thus, this type of investor behavior does not uniformly impact the equity valuations for all companies located within the same MSA.

Finally, results of this study improve the understanding of the implications for dividend announcements. Prior literature has shown that dividend initiations result in positive market reactions for the company making the announcement (Asquith and Mullins 1983; Healy and Palepu 1988; Michaely, Thaler, and Womack 1995). Our research contributes to this vein of literature as providing support that dividend announcements do not only favorably impact the announcing firm but also other dividend paying firms that are located within the same geographical proximity.

This chapter is organized as follows. Section II discusses the development of the relevant hypotheses. Section III provides details of sample selection and descriptive statistics of the data. Section IV reports the univariate results based on the percentage of senior citizen population. Section V discusses the regression analyses, and Section VI provides robustness checks. Section VII concludes the chapter based on the findings.

II. Hypotheses Development

There has been substantial evidence of comovement of stock returns. Among others Barberis and Shleifer (2003), Barberis, Shleifer, and Wurgler (2005) and Kumar and Lee (2006) show that common economic factors cannot fully explain comovement in stock returns. One of the channels that may generate comovement of stock returns is the collective behavior of an investor clientele (Antón and Polk 2014). Specifically, investors that invest in a group of firms based on group characteristics, rather than individual firm characteristics, may generate correlated stock returns among the firms in the group.

Limited attention of investors may lead them to pay attention to group characteristics. Specifically, individual investors are not only limited by available resources (DellaVigna and Pollet 2009), but also by the amount of attention that they can expend when evaluating a firm's prospects (Hirshleifer, Lim, and Teoh 2009). Limited attention leads investors to focus on groups of firms of which they are aware (Barber and Odean 2008). Furthermore, investor characteristics influence the group of firms that the limited attention will be directed towards (Grinblatt and Keloharju 2001). Thus, investors are likely to focus on characteristics of firm groups that fit best with the needs of investors. To the extent that these investors form a critical mass (clientele), they are likely to influence stock valuations.

Investor reactions responding to a firm's significant news event (Ahern and Sosyura 2014; Tetlock 2007) tend to go beyond just the specific firm generating the news. The news announcement not only captures investor attention for the firm with the news, but also may attract attention to firms with similar characteristics. A sizeable clientele response can result in spillover effects for firms that do not generate any news.

In order to test the idea that investors revise their investments of non-news generating firms in response to a positive news announcement of a firm in the same group, we focus on the effect from the presence of local investor clientele (i.e., senior citizen population in a MSA) on market reaction to dividend paying firms in the same MSA, in response to dividend initiation of a firm in the same MSA. Dividend initiations are significant favorable events that attract investor attention (Peng and Xiong 2006). As the stock price movement for new dividend paying firms is significantly positive upon the initiation announcement (Asquith and Mullins 1983; Healy and Palepu 1988; Michaely, Thaler, and Womack 1995), dividend initiations portray the firm in a positive manner to the investors. Furthermore, these positive events are widely cited in the popular media outlets that are likely to capture the attention of investor clientele for dividend paying firms.

Senior citizens are a specific investor clientele that pay great attention to dividend paying firms. In particular, senior citizen investors tend to show a preference for owning dividend paying stocks (Graham and Kumar 2006). Furthermore, dividend initiations are widely cited in popular media outlets which furthers the likelihood in attracting attention of senior citizens. Thus, senior citizens establish an identifiable clientele for dividend paying firms.

Dividend initiations also attract special attention from the local investor clientele. As investors tend to invest locally in firms that are in their same MSA (Coval and Moskowitz 1999, 2001; Huberman 2001; Hong, Kubik, and Stein 2005, 2008). This also suggests higher level awareness of local stocks by local investors. Feng and Seasholes (2004) also show that investor groups located within the same region tend to buy and sell securities in unison patterns within a reasonable time frame. Investors that are geographically close in proximity tend to invest in similar patterns, which provides the foundation for comovement among stock prices in the same MSA. Collectively, senior citizens in an MSA generate clientele for dividend paying firms in the same MSA, which may shed light on the stock price comovement for firms that are located in the same MSA, but not the same two-digit SIC code as the dividend initiating firm (seemingly unrelated firms).

The attention of senior citizens toward dividend initiating firms can bring recognition to other dividend firms in the same MSA. Previous studies show that investors evaluate a company based on a firm's grouping rather than the firm's fundamentals (Barberis and Shleifer 2003; Barberis, Shleifer, and Wurgler 2005; Patton and Verardo 2012). For example, Massa and Zhang (2009) show positive spillover effect for acquirers' values when they pair up with popular targets. That is, investors view acquirers more favorably if they have a favorable opinion of the target firms. A firm with a significant news announcement not only draws investor attention to themselves but other firms with similar characteristics. As dividend initiations attract positive attention for the announcing firm, the news may attract positive attention for other dividend paying firms. This positive spillover of investor attention for other local dividend paying firms may result in a favorable market reaction in the presence of local clientele for seemingly unrelated dividend paying firms, leading to the positive-investor-attention hypothesis:

H1: Seemingly unrelated dividend paying firms will obtain a favorable market reaction when a firm making a dividend initiation announcement is located in an area with a high percentage of senior citizens.

Alternatively, the finite amount of investor attention may lead to seemingly unrelated firms competing with each other for investor attention (Barber and Odean 2008). Firms attract considerable investor attention when they announce the initiation of dividends to shareholders. The increase in investor attention coupled with limited investor resources provides understanding that the increased awareness of the dividend initiating firm may come at the expense of other local dividend paying firms. For example, Hirshleifer, Lim, and Teoh (2009) document the impact of earning announcements on the equity valuation is dependent on how many other firms are announcing and the relatedness between firms making the announcements. Competition for investor attention should intensify as firms compete for similar clientele, specifically, local investors (Coval and Moskowitz 1999, 2001; Huberman 2001; Hong, Kubik, and Stein 2005, 2008).

Existing local dividend clientele may adjust current portfolio allocations to reflect the new information revealed by the dividend initiation. The potential reallocation of limited investor resources may negatively impact other local dividend paying firms. For instance, Hong, Kubik, and Stein (2008) provide evidence that the more numerous firms are in a particular area the lower respective stock price when firms go public, ceteris paribus. A new dividend paying firm provides local senior citizen investors with an additional option for their portfolio, intensifying the competition for attention from this identifiable investor clientele. In response to this heightened competition, seemingly unrelated dividend paying firms may experience an initial negative market reaction when another local firm initiates a dividend in the presence of a local clientele, establishing the investor-distraction hypothesis:

H2: Seemingly unrelated dividend paying firms will experience an unfavorable market response when a firm located in an area with a high percentage of senior citizens makes a dividend initiation announcement.

III. Sample Selection and Descriptive Statistics

Our sample consists of firms that are present in both COMPUSTAT and CRSP from 1980 to 2011. As we are analyzing the impact of a positive news announcement of a firm on surrounding firms, we restrict the positive news sample to just dividend initiations to accurately identify other firms that are located in the same MSA.

For MSA specific characteristics we consult the U.S. Census Bureau and U.S. Bureau of Labor Statistics. In classifying the location of the firm's headquarters, which is identified using the metropolitan statistical area of the firm, we follow a previous study in the locality literature (Almazan, De Motta, Titman, and Uysal 2010). After determining the MSA for the company generating the positive news, we identify all other public firms located within the same MSA. The data set excludes: (i) companies headquartered in Hawaii and Puerto Rico; (ii) dividend initiations and firm observations by financial firms (SIC codes 6000-6999) and regulated utilities (SIC codes 4900-4999); and (iii) firms with less than $10 million in total assets. If observations are missing either debt or cash accounting values, we replace with a value of zero. We winsorize all variables used in the analysis at the bottom and top 1% to reduce the effect of outliers.

We narrow our focus to seemingly unrelated firms that do not have correlated cash flows and risk with the underlying dividend initiating firm. As firms in the same industry have correlated cash flows, we exclude all firm observations that are classified into the same two-digit SIC code as the company making the announcement. As news announcements generated by seemingly unrelated firms may influence their own stock returns, we remove all firms that announce their quarterly earnings and dividend announcements in the same month as the dividend initiation announcement. A final data screen we implement is the requirement that each dividend initiation possess at least 10 remaining firm observations in the same MSA. This screen is attributed to the findings of Hong, Kubik, and Stein (2008) where a few firms located in a specific area can create a larger bias and increase in stock valuations by local investors. The final sample consists of 748 unique dividend initiation announcements with a total of 28,233 seemingly unrelated firm observations.

Previous geographic literature sheds light on the impact of the population of senior citizens within an MSA on a firm's dividend policies (Becker, Ivkovic, and Weisbenner 2011). The population makeup and density within an MSA has a direct correlation in participation by those investors who reside in more sociable and active financial communities (Brown, Ivkovic, Smith, and Weisbenner 2008). Therefore, we assign a binary variable that receives the value of one if the observation is located in the top quartile of the sample in terms of the percentage of senior citizens within a MSA. This data is collected from the U.S. Census Bureau and measured as the population estimates for each MSA by year. This senior citizen variable allows us to capture the portion of stock returns explained by this particular investor clientele.

To assess the market reaction, we calculate the cumulative abnormal returns for firms located within the same area as the firm with positive news. This cumulative abnormal return is derived by utilizing market adjusted returns. We employ the estimation window of -5 to +5 days relative to the corresponding day of good news (dividend initiation announcement date). The extended window allows us to control for leakage of information in the pre-announcement period. It is also imperative for us to allow investors ample time to incorporate this new information into the market for seemingly unrelated firms (Hirshleifer, Lim, and Teoh 2009). Variable definitions are provided in Appendix B.

Table 10 provides the descriptive statistics for the entire sample. The mean cumulative abnormal return is 30 basis points, and there is a large variation around the mean (standard deviation of 740 basis points). This suggests that stock prices of firms in the MSA do not uniformly respond to dividend initiations. Dividend paying companies comprise 54.6% of the entire sample. Therefore, the data are representative of both dividend paying and non-dividend paying companies. Approximately, one-third of all the firm observations are located in the 20 most populous cities in the United States. The *Senior Citizen* variable represents the top quartile in terms of senior citizen density within the MSA; this value is comprised of firms located in areas where the total population is comprised of more than 12.8% senior citizens.

[Insert Table 10 about here]

IV. Univariate Analysis

This section examines the effect of the geographical demographics on the cumulative abnormal returns experienced by seemingly unrelated firms in the same MSA as the firm that initiates dividends. Table 11 reports the mean cumulative abnormal return for the percentage of senior citizens in the MSA quartiles. In Panel A of Table 11, the mean *CAR* of the highest senior citizen percentage quartile is 0.0048, while it is 0.0024 for the lowest quartile. The difference is 24 basis points and statistically significant ($p<0.10$). We further find dispersion in the cumulative abnormal returns between the bottom (-0.0004) and top (0.0024) quartiles of 28 basis points in the sub-sample of dividend paying firms ($p<0.05$). However, the difference of *CAR* for non-dividend paying companies between the senior citizen quartiles is not statistically significant. These findings suggest a disparity in market reactions generated by differential payout policies. Collectively, these findings provide preliminary evidence in support of the positive-investor-attention hypothesis.

We also examine whether our findings are driven by local macroeconomic shocks. Particularly, Panel B reports the effects of high density of senior citizens on *CAR* across state unemployment rate quartiles. We find a negative disparity of *CAR* between the high and low density of senior citizens in three of the four state unemployment rate quartiles. Notably, the difference in *CAR* is significant in the presence of favorable local macroeconomic conditions (smallest quartile of observations for the state unemployment rate). This suggests that our findings are not driven by positive shocks to the local economy. We further control for the state of local macroeconomic conditions in the models.

[Insert Table 11 about here]

Panel C provides further evidence that our findings are not driven by firms located in small cities. Specifically, Panel C examines the observations from companies located within the 20 most populous cities in the United States and outside the populous cities. There is a negative disparity between the first and fourth quartiles of senior citizen density for firms located within and outside the 20 most populous cities. The difference is significant for firms located within the 20 most populated cities, suggesting that our findings are not driven by firms located in small cities. We further account for the differences between observations within and outside the most populous cities in the multivariate regressions.

We also examine the effect of senior citizens across size quartiles, as large and well established firms are more likely to pay dividends to shareholders (Fama and French 2001). However, Panel D documents a notable negative difference of -0.0058 in stock price reaction for the smallest firm size quartile amongst the quartiles of senior citizen percentages, while all quartiles experience a negative disparity. Panel E reports that the lowest quartile of observations, based upon *Tobin's Q*, experiences a meaningful negative difference of -0.0073 between the first (0.0060) and fourth (0.0133) quartiles of senior citizens. Senior citizens are more likely to invest in large firms with low Tobin's Q (Graham and Kumar 2006). Consistent with this investor preference there are significant positive returns for low Tobin's Q firms in areas with a high concentration of senior citizens. This result highlights the important role senior citizen clientele have on local firms when aligned with their investor preferences.

Overall, the univariate analysis provide preliminary evidence in support of the positive-investor-attention hypothesis. The findings lend support to the concept that a particular group of investors (in this case senior citizens) may engage in coarse thinking and not incorporate the good news of a dividend initiation uniformly across all firms located the same MSA. The univariate analysis exhibits the importance of controlling for various factors that are consistent with the investing behavior of senior citizens in the multivariate regression analysis.

V. Regression Analysis

In this section, we examine the comovement of equity values for seemingly unrelated firms to positive news announcements from other firms located within the same MSA. Our empirical methodology follows previous event studies as we conduct a short-term event study and calculate the market adjusted returns for each seemingly unrelated firm using the CRSP value-weighted index. We use the cumulative abnormal returns as the dependent variable to analyze how a firm's positive news announcements influences the stock prices for seemingly unrelated firms located within the same MSA. The dependent variable also allows us to disentangle and identify the channels where a firm's good news influences the comovement in stock prices for seemingly unrelated firms in the same geographic proximity.

Macroeconomic factors have the ability to influence a firm's prospects and market expectations. Specifically, local shocks to firms located within a particular geographic region may generate correlated cash flows; thereby driving comovements in stock valuations. Following Korniotis and Kumar (2013), we use the unemployment rate within the firm's state during the year as a proxy for regional economic shocks. Previous studies on economic geography show the effect of populous cities on investor behavior (Coval and Moskowitz 2001; Malloy 2005). Coval and Moskowitz (2001) document that investors located in the most populous cities tend to hold a higher percentage of their assets locally. This relation has the ability to affect local stock returns as investors can gather "soft information" on locally based firms. Investors place a higher value on this type of investment research which is considered to be private or personal insight into the firm (Daniel, Hirshleifer, and Sybrahmanyam 1998). The difference in the population of the area in which a firm is located also has a direct effect on the analysts covering the companies in a particular area (Malloy 2005). Therefore, we collect the 20 most populated cities in the country from the U.S. Census Bureau from 1980 – 2011; there are minor changes to this variable in the temporal setting as cities become less and more populated. For the time period of the sample, there were a total of 25 different cities that made the list; therefore, we implement a binary variable that is time invariant for all firm observations located within these 25 cities.

To control for a stock price run-up (Jegadeesh and Titman 1993; Grinblatt, Titman, and Wermers 1995), we calculate the previous quarter's return for the stock. The univariate analysis conducted in Section 4 provided evidence for the need to control for total sales of the firms, as senior citizens' market reaction was different across the quartile of smallest firms. We also control for the number of firms in the same MSA so that small MSA size is not driving our findings (Hong, Kubik, and Stein 2008). Finally, we account for the firm's *Tobin's Q*, as Table 11 provides, supporting evidence that senior citizens distinguish the differences between firms with low *Tobin's Q.*

The econometric issues that need to be closely monitored are the correlations between observations and the clustering of observations, as well as the correlation between firms within the same industry. To address the first concern, we employ robust clustered standard errors by MSA (Petersen 2009). Differences in the time when the initiation announcement is made are controlled for by using year fixed effects.

Table 12 reveals a strong effect of senior citizen density on stock price reaction of seemingly unrelated firms. Specifically, *Senior Citizen* variable is significantly positive at the 5% level. The effect is also economically significant. In a response to dividend initiation announcement of a firm in a MSA, there is a favorable market reaction of 40 basis points to the equity price of seemingly unrelated firms located in the same MSA when there is a large senior citizen population. This finding is consistent with the positive-investor-attention hypothesis.

We further examine whether the effect is uniform across firms that have a similar history as the dividend initiating firm. The results of separating the whole sample into dividend paying firms (column 5) and non-dividend paying firms (column 9) are in Table 12. The *Senior Citizen* variable is persistent, representing an increase of stock price by 30 basis points and is statistically and economically significant for the dividend payer subsample. However, the senior citizen density does not significantly impact the equity prices of seemingly unrelated non-dividend paying firms. Therefore, the dividend paying sample is driving the results and lends support in favor of the positive-investor-attention hypothesis.

These findings are critical for the understanding of the channels that are driving the cumulative abnormal returns for seemingly unrelated firms located within the same MSA. As senior citizens prefer dividend paying firms over non-dividend payers, the significant effect of senior citizen density in the subsample of dividend paying subsample, and the insignificant effect in the subsample of non-dividend paying subsample, is consistent with the investor attention hypothesis. The effect of senior citizens is prominent when these firms are already in the radar screen of local senior citizen clientele.

[Insert Table 12 about here]

We have included several firm and MSA characteristics that may influence *CAR*. However, there may be omitted variables that are driving our findings. Therefore, Table

12 reports regression analyses with fixed effects for years (columns 2, 6, and 10), firms (columns 3, 7, and 11), industries, and MSAs (columns 4, 8, and 12). Our initial findings for the sample remain intact with the introduction of fixed effects. When analyzing the fixed effects models for the dividend paying sample, *Senior Citizen* continues to be significant and positive for all models, responsible for a stock price increase of approximately 30 basis points. *Senior Citizen* is insignificant for the sample of non-dividend paying companies. After accounting for by MSAs, industry, and firm characteristics, these findings lend further support to the view that seemingly unrelated dividend paying firms obtain a favorable market reaction when a local firm, in an area with a high concentration of senior citizens, makes a significant positive news announcement.

Other firm characteristics also help explain variation in market reaction to seemingly unrelated news. Specifically, *Stock Return* is highly significant and negative with a value of 0.004 for the entire sample. *Stock Return* continues to be negative and significant for dividend paying firms. This is indicative that the momentum of the returns for the previous quarter does not tend to continue.

VI. Robustness Checks

We employ numerous robustness tests, to verify the inferences from our previous findings. The first robustness procedure we engage in is to incorporate the Text-based Network Industry Classifications (TNIC) data (Hoberg and Phillips 2010a, 2010b), which have been shown to improve upon SIC codes. The TNIC relatedness data are based on textual analysis of a firm’s 10-K, which pair firms with other firms based on similarity scores annually. We screen the data to exclude all firms located in the same two-digit SIC code and firms that are closely related by evidence from the TNIC pair-wise classification. As these data measures are only available for the period of 1996 to 2008, the sample is reduced even further. The total sample for this analysis is 10,668 observations.

After incorporating the TNIC relatedness screens into the data, the previous findings are unchanged. Table 13 reports that *CAR* experiences a positive significant co-movement in equity prices for seemingly unrelated firms located within an area with a high density of senior citizens. Upon separating the data into dividend payers and non-dividend payers, we document a positive shock of 90 basis points to the stock price for dividend paying firms (p-value<0.01), while non-dividend payers do not experience a significant market reaction in the model. Table 13 substantiates the findings that dividend paying firms in areas with a high density of senior citizens receive a positive impact from another local firm's dividend initiation announcement.

[Insert Table 13 about here]

Table 13 incorporates fixed effects along with the additional relatedness measure into the model. The findings in Table 13 substantiate the previous results as seemingly unrelated dividend paying firms receive a positive stock price reaction of approximately 100 basis points when located in areas with a high concentration of senior citizens. *Senior Citizen* for the non-dividend paying sample remains insignificant to the incorporation of the additional relatedness screens. Collectively, not only do the previous results continue to hold, but are strengthened by incorporating the additional relatedness measure into the sample. Thus, our findings are not driven by the limitations of relatedness measures associated with SIC codes.

We also employ two mean regressions methods to test the hypotheses in the paper. The first is averaging the variables across each individual dividend announcement and treating this as a single observation. This method allows us to assess whether the previous findings are driven by a few dividend announcements. The second method is averaging all the observations by the MSA of the dividend initiating firm, resulting in a single observation for each of the MSAs represented in the data. This mean regression enables us to test whether the findings are generated by a large number of dividend announcements in a few MSAs.

The intention of calculating the average of each announcement by the relevant firm observations in the first mean regression is to verify that the previous results are not being motivated by a select few dividend initiations. This results in the sample size decreasing from 28,245 total observations to 748 unique dividend initiation observations. Table 14 columns 1 through 3 report the results for the mean regressions of dividend initiation announcements. The regressions for the dividend paying firms yields similar results to the previous findings where the senior citizen percentage of the MSA significantly increases the equity valuations of dividend paying companies by 40 basis points ($p<0.01$). In the non-dividend paying sample the *Senior Citizen* variable remains to be insignificant. These results are consistent with the positive-investor-attention hypothesis as regions with a high percentage of senior citizens reward dividend payers in the event of a dividend initiation by a firm within the same MSA.

[Insert Table 14 about here]

Table 14 columns 4 through 6 provide the results from the second mean regression in which we utilize based on the average for all variables across a particular MSA. The sample yields 26 observations and three regressions as the construction of the analysis does not allow for any type of fixed effects. As the clustering of standard errors by MSA is not permissible; we apply the correction to the standard errors by the White's method (White 1980). Despite the limited sample size, we continue to find supporting evidence that dividend paying companies within a geographic location with a high percentage of senior citizens experience a significantly positive comovement in stock prices of 70 basis points ($p<0.01$), when another firm initiates a dividend policy. The effect of senior citizens is not significant for the sub-sample of non-dividend paying firms. These findings suggest that a particular area is not generating our results, strengthening the evidence in support of the positive-investor-attention hypothesis.

Firms that are relatively young in their life cycles have greater mobility opportunities than their older counterparts in relocating the firm based on the growth and investment opportunities of a particular geographic location. A firm's initial location is strategically chosen to be conducive to the success of the firm and take advantage of knowledge spillovers (Alcácer and Chung 2007). It is imperative to disentangle the effects of this choice. Therefore, the unobservable characteristics that go into a firm's decision where to locate become less relevant over time. To relieve this concern, we execute regression analyses on the sub-section of firms that have been public for at least 10 years in Table 15.

The evidence in Table 15 is in line with the investor attention hypothesis. Specifically, the cumulative abnormal returns are positively significant not only for the dividend paying sample (p-value<0.05), but the whole sample (p-value<0.10) with stock price reaction of approximately 30 basis points. The impact of the percentage of senior citizens in the area continues to be insignificant for non-dividend paying firms. These results suggest that the findings of the paper are not being influenced by younger firms and their choice in locating the firm.

[Insert Table 15 about here]

The positive-investor-attention hypothesis is built upon behavioral explanations which rely on behavior of individual investors. Thus, the effect should be prominent for firms with low institutional holdings. We obtain institutional holdings measures from the CDA/Spectrum 13F Holdings database. As most companies file semi-annually, we confine our attention, as in Hong and Kacperczyk (2009), to year-end reports for institutional holdings. Consistent with previous studies, we set institutional holdings to zero for firms that do not have institutional investors reported in the dataset. We measure institutional holdings as the ratio of shares held by institutional investor relative to total shares outstanding. We define high institutional holding as a binary variable, if the institutional holdings for the firm in the year preceding the dividend initiation is located in the top quartile of the sample. Observations not in upper quartile are identified as low institutional holding.

Table 16 provides regression analysis for the institutional holdings of the sample. The cumulative abnormal returns are significantly positive when there is a large percentage of senior citizens and low institutional holdings for both the entire sample (p-value<0.01), and the dividend paying sub-sample (p-value<0.01). However, the effect of senior citizen is not significant when there are high institutional holdings. Collectively, these findings are consistent with the positive-investor-attention hypothesis.

[Insert Table 16 about here]

It is plausible that macroeconomic factors impacted equity returns for all dividend paying firms located in areas densely populated with senior citizens, not only those located in the same MSA as the initiating firm during the event window. To alleviate this concern, we collect relevant data pertaining to all firms outside the MSA where the dividend initiation occurred. Following the same data screens used in the previous analysis, the sample of unrelated dividend paying firms, defined as firm observations outside the MSA and not within the same two-digit sic code of the announcing firm, consists of 168,878 observations (columns 1 through 4). Table 17 includes a variety of fixed effects in the regression analysis and the *Senior Citizen* variable is significant for the base model for the dividend sub-sample, but becomes insignificant once fixed effects are introduced. Thus, the insignificant effect of senior citizens on stock prices of firms located outside of the dividend initiating firm suggests that macroeconomic shocks are less likely to drive our findings.

[Insert Table 17 about here]

It is also viable that the dividend initiation announcement influences the equity prices of related firms (same two-digit SIC code) that are located in other geographical areas with high percentages of senior citizens. We address this issue by retrieving the data for all dividend paying firms with the same two-digit SIC code that are not in the same MSA as the initiating firm for the sample. Ignoring the data screen of requiring ten observations per MSA, we employ the remaining data requirements; the resulting sub-sample of dividend paying outside MSA observations of related firms consists of 9,333 observations (columns 5 through 8). Table 17 implements numerous fixed effects in the regression analysis and the *Senior Citizen* variable remains insignificant across the sub-sample, except when firm fixed effects are incorporated, *Senior Citizen* becomes negative with marginal significance. Table 17 provides additional evidence that the main finding is contained to seemingly unrelated firms within the same geographic location of the positive news announcement. The conclusion provided by Table 17 further lends support to the hypothesis that when a firm initiates a dividend in an area with a high percentage of senior citizens, seemingly unrelated dividend paying firms in the same MSA experience a favorable equity reaction.

An alternative explanation for the findings in the paper is that the limited supply of dividend paying firms in the MSA for local senior citizens may generate positive returns for seemingly unrelated firms. Specifically, our findings may be driven by observations where there are relatively few dividend paying firms in the MSA as the dividend initiating firm. We alleviate this concern by replacing the number of firm observations for each dividend initiation with the number of dividend paying firm observations. Table 18 reports findings that are consistent with previous findings where the dividend paying sample receives a significantly positive reaction of approximately 30 basis points. The level of dividend paying firms are not responsible for the positive stock market reaction for seemingly unrelated dividend paying companies in areas with a high concentration of senior citizens.

[Insert Table 18 about here]

The finding that seemingly unrelated dividend paying firms receive a positive market reaction may be driven by the increase of their dividend payouts following the dividend initiation. Therefore, we collect the payout policy of the firm one year prior to the declaration date and the payout policy the year following the initiation. If the firm increased dividend payouts the year following the initiation announcement, the *Dividend Increase* binary variable receives a value of one and zero otherwise. Table 19 reports coefficient estimates of the probit model in which the dependent variable is the *Dividend Increase* variable. Seemingly unrelated dividend paying firms located in areas with high senior citizen density do not have a higher probability of increasing dividend payout after the initiation announcement. This provides further evidence that dividend paying firms within densely populated areas with senior citizens were not more likely to increase dividends than those that were not following the dividend announcement. Thus, our findings are less likely to be attributed to future changes in the payout policy of local firms.

[Insert Table 19 about here]

A plausible economic driver for the findings is that the dividend paying firms located in areas with a high percentage of senior citizens in the sample may experience a significant increase in their cash flows the year of the dividend initiation. Thus, our findings may be reflecting the market rewarding these firms for the increase in profitability and has no correlation to the dividend initiation announcement of a nearby firm. To address this possibility we calculate the mean industry adjusted change in profitability (*EBITDA/TA*) from the year of the initiation to the firm's prior year profitability for the dividend paying sample. Table 20 shows that dividend paying firms located in areas with a high density of senior citizens do not experience a significant change in their profitability the year of the initiation announcement. These results combined with those from Tables 16, 17, 18, and 19 are not fully consistent with the alternative hypotheses and rather strengthen the evidence in support of the positive-investor-attention hypothesis.

[Insert Table 20 about here]

In a final robust analysis we re-estimate the model using multiple dependent variables calculated across a variety of extended event windows, including the event window (-0, +0), a three-day window (-1, +1), and a five-day window (-2, +2). As our focus is dividend paying firms in areas densely populated with senior citizens, we only report the estimates of the dividend paying sub-sample of the data, and for brevity we do not report the estimates of the control variables. Using the event day (columns 1 through 4) as the dependent variable, Table 21 shows that seemingly unrelated dividend paying firms located in areas with a high percentage of senior citizens have a significant positive equity reaction to the dividend initiation across all specifications. The three-day event window (columns 5 through 8) is significantly positive across all qualifications. The last model reported is representative of the five-day event window (columns 9 through 12) and provides supporting yet weaker results as *Senior Citizen* is only significant for the base model and the firm fixed effects regression. Table 21 exhibits suggestive evidence that the length of the event window is not dictating the findings and supports the positive-investor-attention hypothesis.

[Insert Table 21 about here]

VII. Conclusion

Previous studies document that the comovement of stock prices is not fully explained by firm fundamentals. The ability of an individual firm's actions to have an effect on stock prices of surrounding firms is important to understand; however, the literature provides limited evidence of these channels. In this study, we investigate how and why investor clienteles contribute to stock price comovement. Controlling for firms with correlated cash flows and risks, provides us the setting to study the direct market reaction of a news announcement on seemingly unrelated firms who possess similar investor clientele.

The findings in this paper reveal novel evidence on the comovement of stock returns. Specifically, we find evidence that capital markets react favorably to seemingly unrelated firms in an MSA with a high percentage of senior citizens when a firm makes a dividend initiation announcement. This finding is prevalent for dividend paying firms and insignificant for non-dividend paying firms providing evidence of the positive-investor-attention hypothesis. The persistency of this outcome is robust to numerous empirical methods and measures. Evidence throughout indicates positive spillover effects of significant positive news (e.g., dividend initiations) for seemingly unrelated firms within the same geographical location in the presence of individual investor clientele (e.g., senior citizens).

Our findings contribute to the literature by providing evidence that the local demographics of a firm influence stock returns. We identify a channel in which news announcements of a firm have the ability to affect other local seemingly unrelated firms. The evidence suggests that a firm's local investor clientele observe significant news announcements of one local firm and associate the announcement as news for other seemingly unrelated firms within the same MSA. The preferences of particular investor clientele in firm characteristics can help explain the comovement of equity returns between firms in the same geographical area.

Chapter 3:

Benefits of Government Bank Debt Guarantees: Evidence from the Debt Guarantee Program[30]

I. Introduction

Recent financial economics literature has often focused on government intervention and the potential negative consequences thereof. In particular, Dam and Koetter (2012), Hryckiewicz (2014), and Poole (2009) share a negative perspective on the economic impact of government intervention upon the financial system. Likewise, criticism of government guaranteed bank deposits has proliferated. Pennacchi (2006) and Gropp, Gruendl, and Guettler (2014) show that deposit insurance is linked to increased risk-taking. Still, the magnitude and the frequency of government intervention into financial markets suggests that there may be some positive effects. Recent theory provided by Cheng and Milbradt (2012) suggests that bailouts can increase economic value by instilling confidence in credit markets. Furthermore, the far reaching benefits of government bailouts may have the ability to outweigh any moral hazard effect (Cordella and Yeyati 2003).

Government intervention often plays a critical role in resolving financial crises. We provide detailed analysis for a relatively new kind of intervention – government guaranteed bank bonds – by documenting the widespread benefits throughout the banking and financial sector. Our sample utilizes bonds issued by financial firms that were insured against default by the Federal Deposit Insurance Company (FDIC) under the Debt

[30] This chapter is based on collaborative work with Jeffrey R. Black and Duane Stock.

Guarantee Program (DGP). This program was the first government guarantee of publicly traded corporate bonds in the United States. The importance of our research is enhanced as the adoption of governments offering bank bond guarantees has recently gained popularity by governments as a tool in response to financial crises. The bond guarantees that were adopted by many other nations in response to the most recent financial crisis were thought to be helpful in preventing bank failures and subsiding a more severe credit crisis. Debt guarantees in other countries have also been successful in curbing the deterioration of the public confidence in the banking system (Schich 2009).

The purpose of this research is to understand how well bond guarantees accomplish their intended objective of reducing the risk of a systemic meltdown during a financial crisis by way of increasing bank bond liquidity.[31] This study provides strong evidence that a government guarantee of newly-issued bank debt during times of financial turmoil improves bank bond liquidity, which reduces rollover risk for the issuing entity, and ultimately lowers the overall default risk of the institution (not just the default risk of the insured bonds). Our findings establish empirical support for the adoption of bank debt guarantees as a financial tool in the midst of a financial crisis.

A first order effect of issuing guaranteed bank bonds is the significantly greater bond market liquidity relative to uninsured counterparts. We estimate the bid-ask spreads on FDIC-insured bonds were about 83.9% smaller than uninsured bonds of the issuing firms. This enhanced liquidity allows the government-insured debt to boast dramatically lower transaction costs than non-insured debt and thus inject liquidity into a bank's debt

[31] We consider liquidity throughout the remainder of the paper as the ease of buying or selling a bond, as measured by the natural logarithm of the bid-ask spread consistent with the bid-ask spread methodology of Hong and Warga (2000).

markets. The augmented liquidity of these debt issuances significantly reduced borrowing costs through multiple channels.

In accordance with financial policy crafted with the intent to alleviate concerns about the "financial accelerator," described by Bernanke, Gertler, and Gilchrist (1996), the benefits for each bond issue are positively correlated with the default riskiness of the issuing firm. Intuitively, guaranteed bonds can be issued at lower yields due to the reduced default risk. This yield reduction benefit could potentially be completely offset by an insurance premium paid to the guarantor reflecting the issuing firm's default risk. If so, in the broad context, the firm itself receives a limited direct cost benefit by issuing guaranteed debt, but may still realize increased demand for their guaranteed debt issues and thus realize greater liquidity for their bonds. However, we find guaranteed bond yields were 435 basis points lower than yields of non-guaranteed issuances (net 329 basis points after accounting for the insurance premium paid to the FDIC).

As intended, the safety of the insured debt instruments attracted considerable demand, significantly increasing the liquidity of guaranteed bonds, compared to their uninsured counterparts. Participation in the guarantee program increased with the relative liquidity improvement compared to non-guaranteed issues. Herein is the central purpose of a debt guarantee program. As investors embark on a flight to quality during turbulent economic times, the government-guaranteed safety of the insured bonds is meant to attract safety-seeking investors to bank debt. This insured bank debt often replaced maturing debt for the firm, reducing rollover concerns and, ultimately, firm default risk as well. The ability of each bank to reduce its unique default risk lessens the overall risk of contagion and crisis throughout the financial sector.

We examine the cross-sectional variation in this benefit to determine which bank characteristics commanded a greater benefit. Riskier firms and firms issuing debt during more risky times received a larger yield reduction, even after accounting for the insurance premium paid. This evidence suggests policy makers were concerned about the "financial accelerator," in which small systematic shocks are amplified by the deleterious actions (i.e. default, reduction in credit extension, or a decline in spending) of weaker firms which are adversely affected by the original shock.[32] Seemingly in accordance with concerns about the "financial accelerator," policy makers constructed the program and insurance premiums to assist riskier and weaker banks to a greater extent than others. One way this was accomplished was via a positively-sloped term structure of insurance premia, given that we find a negative credit spread term structure (CSTS) for weaker banks. By instituting a positively-sloped term structure of insurance premia for all firms, irrespective of individual firm risk, the program not only provided greater benefits to riskier firms, but also encouraged them to issue shorter-term rather than longer-term debt for their rollover purposes. These results favor the ideology that financial institutions in the greatest need for support in accessing public debt markets during a crisis should be able to receive the most government support, consistent with Bernanke et al. (1996).

As suggested above, we show the CSTS of debt for riskier banks, which was negatively sloped for uninsured debt, was transformed to a positive slope for guaranteed debt, thus encouraging banks to rollover maturing debt (high risk during times of economic turmoil) using insured, lower-rate, short term debt. A negatively-sloped CSTS for high-risk bank debt is consistent with the Merton (1974), Lee (1981), and Longstaff

[32] The financial accelerator is described in greater detail by Bernanke et al. (1996), Krishnamurthy (2010) and Caballero and Krishnamurthy (2008).

and Schwartz (1995) theoretical solutions for the term structure of credit spreads. In contrast, we find a flat CSTS for highly rated debt (AAA and AA) which is also consistent with classic theory of credit spreads.

Besides the above classic theory of term structure of credit spreads, we furthermore consider how term structures of credit spreads are affected by rollover risk and investor preferences in a crisis. He and Xiong (2012) maintain that the financial crisis of 2008 strongly illustrated how deterioration in liquidity interacts with an increased default risk thus increasing credit spread. Hence, rollover cost considerations, when added to other numerous factors affecting CSTS slope, encourage the CSTS to be negatively sloped as is portrayed in their computations. Separately, Gorton, Metrick, and Xie (2014) propose a theory of CSTS during financial crisis, stressing the impact of lender behavior. They posit this effect should cause the slope of the CSTS to be positive. Our results indicate the rollover effect of He and Xiong (2012) may dominate the credit tightening effect of Gorton et al. (2014) as we find a negatively-sloped CSTS during the crisis.

While augmented debt market liquidity and reduced cost of debt are pleasing benefits to the banks participating in a government guarantee program, another related goal of a bank debt guarantee is to more broadly reduce default risk of the firm and the contagion risk to the economy. Our empirical analysis suggests the marginal firm's default risk (measured by its 5 year credit default swap spread) decreased by approximately 5% when participating in the DGP. This reduction in default risk, stemming from the increased liquidity and DGP participation is the first empirical evidence supporting the theory proposed by He and Xiong (2012) and He and Milbradt

(2014). The improvement in default risk is also consistent with Greatrex and Rengifo (2012) who find that other instances of government intervention during the financial crisis reduced CDS spreads.

He and Milbradt (2014) hypothesize an endogenous loop of improving debt market liquidity and default risk. Accordingly, Liu, Longstaff, and Mandell (2006), and Ericcson and Renault (2006), among others, show a strong positive correlation between liquidity and credit quality. The government guaranteed bank debt, which exogenously lowers default risk, may improve the liquidity of otherwise unaffected non-guaranteed bonds of these same banks. On the other hand, it is plausible that guaranteed bonds exogenously affect the level of default risk for a firm without directly impacting the liquidity of outstanding non-guaranteed bonds as the guaranteed securities are the only bonds explicitly protected against default risk. In fact, the effect of insured bonds upon non-insured bond liquidity of the same firms could be negative, as the newly issued guaranteed bonds could direct investor attention away from the outstanding, non-insured bonds. We test this using a difference-in-differences approach and find that bid-ask spreads on non-guaranteed bonds of participating firms declined (liquidity improved) by more than 12% following their DGP participation announcement. This is the first such test of this half of the endogenous liquidity-default loop because there rarely exists an event which exogenously affects the default risk of a security without directly affecting liquidity, as is the case here. The DGP is thus an optimal setting for such a test. The results of the difference-in-differences analysis appear to confirm the assertion made by He and Milbradt (2014) that lower default risk increases debt liquidity.

A legitimate concern for many citizens and policymakers with regard to a government bond guarantee would be the losses experienced on guaranteed debt defaults. Anecdotally, this was not the case with the DGP. In the specific case of the DGP, only six institutions defaulted on their insured liabilities, resulting in a $153 million loss to the FDIC – which was less than 2% of the total premiums collected under the program (FDIC 2013), suggesting that the FDIC enjoyed a gross profit of approximately $10.2 billion.

The evidence from our analysis suggests the beneficiaries of bank bond guarantees were widespread throughout the banking and financial sector. We observe that the outcome of DGP participation was not only beneficial to all stakeholders involved, but also consistent with recent financial theory. However, it is important to understand the quality of the guarantee provided through this particular program. We acknowledge that it may not be appropriate to generalize these findings and suggest all governments follow suit, as the guarantee in the DGP was backed by the United States government, considered by many to be a sovereignty without default risk. Government bank bond guarantees, while not appropriate in every situation, can be a very effective form of government intervention in the midst of a financial crisis, particularly in the cases of exceptionally strong guarantors.

The paper is organized as follows. Section II provides an in-depth explanation of the FDIC Temporary Liquidity Guarantee Program, and the Debt Guarantee Program in particular. Section III develops the relevant hypotheses. Section IV provides details of the sample and descriptive statistics of the data. Section V reports the empirical findings. Finally, Section VI concludes the research.

II. FDIC Debt Guarantee Program

The financial crisis of 2008 triggered numerous large U.S. government interventions into the financial sector. Perhaps the best known intervention was the Troubled Asset Relief Program, TARP, wherein the U.S. Treasury purchased preferred stock of numerous banks.[33] Separate from TARP, the FDIC executed a program called the Temporary Liquidity Guarantee Program (TLGP) which consisted of two components. The first part and most widely known portion of TLGP was the Transaction Account Guarantee Program (TAGP) wherein the FDIC fully guaranteed non-interest bearing transaction accounts. The second portion of TLGP was the Debt Guarantee Program (DGP). This research focuses on the second component, in which the FDIC insured senior unsecured debt issued under the DGP, in return for an insurance premium. Morrison and Foerster (2009) estimate that about two thirds of senior unsecured bank debt issued after the peak of the crisis was insured under the DGP program. An important aspect of this program was that it was the first instance of a U. S. Treasury guarantee of corporate bonds in the United States.[34]

Initially, all eligible financial institutions were automatically enrolled into both TAGP and DGP programs with coverage beginning at the approximate peak of the crisis on October 14, 2008. The enrolled entities had until December 5, 2008 to decide whether or not the entity would choose to participate in the programs. In contrast to TARP, the FDIC published the banks that decided to opt-out of any part of the program, leaving the names of those that chose to stay in the program unannounced with no regard to whether

[33] Kim and Stock (2012) and Veronesi and Zingales (2010) analyze how different claims were affected by TARP issuances.
[34] The guarantee was through the FDIC where it was clearly stated that the guarantees were backed by the full faith and credit of the U. S. Treasury.

they desired to participate or simply ignore the program. Due to this procedure, we use the bank's first announcement of a guaranteed bond issue as the public's first confirmed knowledge of the bank's participation in the DGP.

The principal function of DGP was to provide a guarantee on new issues of senior unsecured debt offered by the financial institution. The FDIC (2008) cites the purpose of this program was "to strengthen confidence and encourage liquidity in the banking system by guaranteeing newly issued senior unsecured debt of banks, thrifts, and certain holding companies, and by providing full coverage of non-interest bearing deposit transaction accounts, regardless of dollar amount." The debt guarantee limit was restricted to 125% of the face value of senior unsecured debt that was outstanding as of September 30, 2008 and scheduled to reach maturity on or before June 30, 2009 (Federal Register 2008). Financial entities with no senior unsecured debt within the specified time period were provided a limit for bond guarantees of two percent of the total consolidated liabilities as of September 30, 2008. The last day to issue debt under the DGP was October 31, 2009, and the debt guarantee expired either at maturity or on December 31, 2012, whichever came first. The DGP applied to a very large proportion of bank funding and thus allowed for a maximum of approximately $1.75 trillion of insured debt to potentially be issued[35], wherein approximately $618 billion was actually issued. The insurance premia applicable to the DGP are outlined in Panels A and B of Table 22, where Panel A describes premia for earlier issues and Panel B describes additional premia for issuances after April 1, 2009.

[Insert Table 22 about here]

[35] According to Morrison and Foerster (2009) there was 1.4 trillion of eligible debt outstanding at the end of September 2008. Thus, firms could have used 1.75 trillion of insured debt (125% of 1.4 trillion).

III. Literature Review and Hypothesis Development

Government guarantees allow firms to rollover their maturing debt by creating additional demand for their bonds during turbulent market conditions. By comparing spreads of assets with different safety but similar liquidity, as well as different liquidity but the similar safety, Krishnamurthy and Vissing-Jorgensen (2012) show that investors demand both the liquidity and the safety of US Treasuries. During a flight-to-quality episode, this demand is intensified, leading investors to extend troubled or suspect firms a smaller portion of credit extended, raising rollover costs and consequently raising default risk.

A debt guarantee from a credit-worthy government will mitigate the effects a flight-to-quality episode for poor credit quality institutions, as it improves the credit quality of any debt issue to that of the guaranteeing entity. This will increase demand for that security, which should manifest in greater liquidity.

Hypothesis 1: *Government-guaranteed bonds are significantly more liquid than their non-guaranteed counterparts.*

The financial accelerator occurs when a small shock to a financial system is amplified by worsening market conditions for one or more reasons, which in turn leads to weaker firms defaulting and further worsening market conditions. Bernanke et al. (1996) presume that at the onset of a recession, due to a flight-to-quality, a lesser proportion of credit will be extended to weaker firms. This increases the cost of external funding for these firms. The increased cost of funds reduces the borrower’s production and ultimately encourages default. This will lead these firms to become a proportionally greater part of the decline in economic activity.

Furthermore, in order to diminish any effects of the financial accelerator, policy makers should target the firms which are most likely to default. Accordingly, weaker banks should receive a larger share of the benefits afforded from any government intervention in order to reduce the risk of the financial accelerator defined by Bernanke et al. (1996).

Hypothesis 2: *Bond issuances of riskier firms receive a greater reduction in cost of debt from a government guarantee than bond issuances of safer firms.*

Similarly, and by the same logic, a government guarantee should be constructed in such a way that debt issuances during more turbulent times should receive a larger reduction in the cost of debt. This relationship does not even need to be a function of the insurance premia structure provided by the insuring agency. In fact, this relationship should be rather mechanical since yields of uninsured bonds should be higher during more turbulent times; and insured bonds, which default risk is of little to no concern, should be rather unaffected by general market volatility.

Hypothesis 3: *Government guaranteed debt issued during more volatile market conditions receive a greater reduction in the cost of debt.*

For a government guarantee to be constructed in a way which favors the riskiest firms, the insurance premium paid for the guarantee should not vary by individual firm characteristics. In fact, in the specific case of the DGP, the insurance premium did not vary by firm characteristics, but instead by the maturity of each issue, as exhibited in Table 22. Thus, one should expect that the credit spread reduction associated with each debt issuance would vary by maturity. Therefore, we describe the complex theory and empirical evidence of how CSTS behave, as well as illustrate the potentially strong qualitative differences about CSTS shape and slope for different credit qualities in Figure 2.

Research on credit spread term structure has a long history beginning with Merton (1974) where, in the first structural model of credit spreads, he gives arbitrage-free solutions for CSTS. His classic results, later refined and corrected by Lee (1981), are that lower credit quality bonds may well have a negative CSTS slope, but the slope for high grade bonds is qualitatively different. That is, higher credit quality bonds have a hump shaped CSTS, where the credit spread first increases with maturity, peaks at some maturity, and then declines. See Figure 2 for qualitatively representative plots of Merton's (1974) theoretical results.

[Insert Figure 2 about here]

In another classic theoretical paper, Longstaff and Schwartz (1995) give CSTS plots using alternative measures of credit quality such as the value of the firm relative to a low threshold firm value where default occurs and, the volatility of firm value. The qualitative results are broadly similar to Merton (1974) where, for example, high quality firms have a positive slope throughout or, alternatively, a humped shape where the negatively sloped portion has only a mild negative slope. Figure 2 shows a high grade term structure qualitatively representative of Longstaff and Schwartz (1995).

Empirical tests of CSTS typically use nonfinancial firms as the sample. Among these many empirical tests of CSTS, Sarig and Warga (1989) and Fons (1994) find a negative CSTS. More recently, Krishnan, Ritchken, and Thomson (2006) find, on average, the CSTS for banks, including strong banks, is negatively sloped. However, the negative slope is much stronger and much more statistically significant for low credit quality banks compared to higher credit quality banks. The average negative slope found by Krishnan et al. (2006) is qualitatively represented in Figure 2. In contrast to the above literature, Helwege and Turner (1999) find the CSTS tends to always have a positive slope. More recently, Covitz and Downing (2007) support a positively sloped CSTS. In summary, classic theory suggests many alternative shapes and slopes of CSTS. Furthermore, the empirical testing of CSTS slopes do not yield clear predictions.

In the case of the DGP, the cost of debt reduction would not be homogenous across firms due to the positive term structure of the insurance premium. Riskier firms would realize greater benefits when issuing short term debt over long term, while safer firms would not necessarily benefit more or less based on their maturity choice.

Hypothesis 4: *For higher-risk firms, shorter-term government guaranteed debt issuances receive a greater reduction in cost of debt than longer-term debt; however, for lower-risk firms the cost of debt reduction from a government guarantee does not vary by maturity.*

Clearly a government debt guarantee will lead to a reduction in default risk on a bond level for the individual guaranteed issuances. However, for a government intervention to be successful in mitigating contagion risk, default risk of banks must be reduced on a firm level – not only for specific, guaranteed issuances.

He and Xiong (2012) develop a theory in which a firm's default risk is dependent on debt market liquidity. He and Milbradt (2014) extend their work, theorizing an endogenous loop in which default risk and debt market liquidity are dependent on one another. The dependence of default risk on liquidity is caused by more liquid debt instruments having lower yields, which lowers actual firm costs. This raises the optimal default boundary of a firm, lowering its default risk. Therefore, because guaranteed debt issuances are more liquid than non-guaranteed issuances, and carry a lower cost of debt, the overall firm default risk should be reduced if a firm participated in a government debt guarantee program.

Hypothesis 5: *Participation in a government debt guarantee leads to a decrease in default risk at the firm level.*

As stated previously, He and Milbradt (2014) assume liquidity is determined, in part, by default risk. This has never been strictly shown in the empirical literature due to the endogenous loop between liquidity and default risk. However, participation in a government debt guarantee creates a pseudo natural experiment by exogenously reducing default risk of the firm (and therefore *all* of its bonds) without directly affecting the liquidity of non-guaranteed bonds on an *ex ante* basis. Therefore, when observing the change in the bid-ask spreads of the non-guaranteed bonds of participants in a government debt guarantee, one would expect to see the liquidity improve relative to the rest of the bond market.

Hypothesis 6: *The previously outstanding, non-guaranteed debt issued by participants in a government debt guarantee experiences an improvement in liquidity.*

This research contributes to several strands of literature. First and foremost, it extends the current line of literature relating to the benefits of government intervention (Cordella and Yeyati 2003; Veronesi and Zingales 2010; Cheng and Milbradt 2012; Ambrose, Cheng, and King 2013; Hryckiewicz 2014) by being the first to empirically document how government debt guarantees alleviate stress in the banking and financial sector during financial crises. While Veronesi and Zingales (2010) look broadly at the DGP, estimating an extreme transfer of wealth from taxpayers to bank bondholders, our study differs in that we document the specific benefits of government debt guarantees, including the liquidity enhancement of debt, the cost of debt reduction, and the reduction in default risk – as well as documenting the FDIC's ex post profit from the DGP.

The next area in which this study contributes is the pricing of government guaranteed debt. Many urged the FDIC to adopt a risk-based program, with insurance premia ranging from 10 to 50 basis points depending on CAMEL rating.[36] Several studies argue that moral hazard is an inherent concern of government debt guarantees (Schich 2009; Levy and Schich 2010; Levy and Zaghini 2010; Grande, Levy, Panetta, and Zaghini

[36] See the Federal Register, Part VII, FDIC, 12, CFR Part 370.

2011) and would suggest that riskier firms should have to pay a larger insurance premium than safer firms to mitigate further moral hazard. Contrarily, we contribute to the literature by showing that the DGP was actually priced according to the theory of the financial accelerator (Bernanke et al. 1996; Krishnamurthy 2010; Caballero and Krishnamurthy 2008) and by not changing the insurance premia based on risk. Policymakers inherently provided a greater reduction in the cost of debt to riskier firms and firms issuing debt during riskier times, theoretically in an effort to mitigate contagion risk.

This important contribution is enhanced since the United States is not the only government to respond to a financial crisis by offering bank debt guarantee. The bond guarantees that were adopted by many other nations in response to the financial crisis were thought likely helpful in preventing bank failures and more severe credit crises (Grande et al. 2011). Schich (2009) finds that guarantees of other countries were useful in curbing the deterioration of the public confidence in the banking system. Levy and Schich (2010) analyze the design of the different bank bond guarantee programs across different countries. Levy and Zaghini (2010) investigate the determinants of yield spread differences between guaranteed bonds in different countries. This literature is relatively new with many important questions yet to be answered.

Next, we contribute to the vein of literature on the shape and slope of the term structure of bank yield spreads. In contrast to Helwege and Turner (1999), Covitz and Downing (2007) and Krishnan et al. (2006), we find that during the financial crisis, the term structures of bank yield spreads were negatively sloped for riskier firms and flat for safer firms, which aligns closer to theory of Merton (1974), Lee (1981), and Longstaff and Schwartz (1995).

Finally, we contribute to the literature pertaining to bank rollover risk and the endogenous liquidity-credit risk loop (Acharya, Gale, and Yorulmazer 2011; He and Xiong 2012; He and Milbradt 2014) by showing that the improved liquidity and reduced cost of debt provided by government guaranteed debt both reduces default risk of firms and improves the liquidity of previously issued, non-guaranteed bank debt. The effect of lowered default risk improving liquidity has long been assumed but to our knowledge we are the first to show the causal relationship, due to the endogenous nature of default risk and liquidity.

IV. Data Description

The bond data we use to conduct the research is comprised of all bond trades from the Trade Reporting and Compliance Engine (TRACE) database from 2008 through 2009. We use this time frame because bonds insured under the DGP had to be issued between October 14, 2008 and November 1, 2009. Furthermore, this period was one of financial stress and we wish to analyze yields and spreads during a stressful period. The earliest issuance date was November 25, 2008 and the latest insured bond maturity date is December 28, 2012, which is three days before the FDIC guarantee would have expired. Thus, the maximum maturity of the bonds was approximately four years. We use Mergent Fixed Investment Securities Database (FISD) and the FDIC Temporary Liquidity Guarantee Program Archives to identify the DGP bond issuances by CUSIP number.

To eliminate erroneous entries in the TRACE data, the transactions are filtered according to the methods outlined by Dick-Nielsen (2009). The data are then processed further using a 10% median filter as described in Friewald, Jankowitsch, and Subrahmanyam (2012). Following Bessembinder, Kahle, Maxwell, and Xu (2009), daily yields are obtained by weighting individual trade prices by volume and finding the yield from the weighted-average price. We eliminate observations with yields less than 0 and greater than 100 to remove erroneous entries. The insured bonds do not contain any embedded calls, puts, or convertibility options; and to preserve comparability we limit the sample of non-insured bonds only to those without these embedded options.

We use TRACE for trade-level data, Mergent FISD for bond-level data, and COMPUSTAT for firm-level data. We collect a daily midpoint (average of bid and ask prices) of the 5 year CDS spreads from Datastream. We also use VIX data from the Chicago Board Options Exchange (CBOE), the Baa-Aaa spread and US Treasury yields from the St. Louis Federal Reserve Electronic Database (FRED), as well as hand collect the earliest public confirmation of DGP participation for each firm from Factiva, Bloomberg, and other various news sources.[37] Treasury yields for all maturities are linearly interpolated from the FRED data.

We construct several variables from the data. First, we construct the *Rating* variable which increases with firm default risk. AAA rated firms are assigned a value of zero, AA+ firms are assigned a value of 1, AA firms a value of 2, and so on with each downward step increasing the variable by one unit. We also construct *Ln(Bid-Ask Spread)* by estimating the bid-ask spread using the methodology of Hong and Warga (2000); that

[37] If we are unable to find any public confirmation of DGP participation then we assume that the issuance date of the first guaranteed bond is the first public knowledge that a firm is positively a DGP participant.

is, we subtract the average sell price from the average buy price and divide by the mid-point for each bond-day, and then take the natural logarithm. We use the natural logarithm to deal with the skewed nature of bid-ask spreads, as well as improve interpretability of the regression coefficients. Similarly, we also define *Ln(Issue Size)* and *Ln(Firm size)* as the natural log of issue size and firm assets scaled by one million dollars. Finally, we construct *Post Announcement* as a binary variable. For DGP-participating firms, this equals 1 for observations after the firm announces its DGP participation, and 0 prior to the announcement date. For nonparticipants, this variable equals 1 after October 20, 2008 (the earliest DGP participation announcement) and 0 before.

Table 23, Panels A and B, provides daily descriptive statistics for the bonds from October 1, 2008 through October 31, 2009. Panel A displays statistics for the full sample, while Panel B is limited to only guaranteed bonds. We see 27 percent of the bond-days in the sample are issued by firms participating in the DGP. The credit ratings of the issuing firms ranged from AAA to CC. It is important to note that while all guaranteed bonds were rated AAA, we use the credit rating of the issuing firm rather than the bond itself, so we can conduct ceteris paribus analysis when comparing guaranteed and non-guaranteed bonds of the same firm. Standard & Poor's debt ratings were acquired at a firm level from COMPUSTAT.

[Insert Table 23 about here]

For firm-level regressions, several bond-level variables need aggregated to the firm level. We do this based on trading volume. We calculated the percent of bond volume guaranteed under the DGP *(% Gntd. Volume*) by dividing the trading volume of a firm's bonds guaranteed under the DGP by the total trading volume of the firm's bonds. We calculate the daily log of the bid-ask spread by taking the natural log of the volume-weighted average of a firm's bonds' bid-ask spreads. Finally, we calculate the standard deviation of the bid-ask spread – to proxy for liquidity risk and rollover risk – as the rolling 5-day standard deviation of the volume-weighted average of a firm's bonds' bid-ask spreads, following Dick-Nielsen, Feldhütter, and Lando (2012).

V. Empirical Findings

Government guarantees allow firms to rollover their maturing debt and potentially create additional demand and liquidity in the market for their bonds. A debt guarantee from a credit-worthy government may well turn the table on a flight-to-quality episode, as it improves the credit quality of any debt issue to that of the guaranteeing entity.

We first test whether government guarantees actually increased the liquidity of debt issuances. This should be the case in a flight-to-quality episode, as the guarantee increases the safety of debt, and likely increases the demand for that security in a market when investors flock to safe assets. In this context, we estimate the difference in liquidity of guaranteed and non-guaranteed bonds.

To do this, we regress the natural logarithm of the bid-ask spread on a dummy variable indicating whether a bond is guaranteed, as well as, control variables that affect bid-ask spreads as given by Chakravarty and Sarkar (2003). For this regression, the sample includes only bonds (both guaranteed and non-guaranteed) issued by DGP-participating firms. We also limit the sample to observations after the firm has announced their participation in DGP. This results in 26,267 bond-day observations from 1,966 bonds.

As shown in Model 1 of Table 24, if a bond is guaranteed, the natural logarithm of the bid-ask spread is 1.824 units lower, which means that government guaranteed bonds have 83.86 percent[38] smaller bid-ask spreads than their non-guaranteed counterparts. While a certain level of liquidity improvement was expected, this result indicates a vast difference in liquidity due to the government guarantees which is supportive of Hypothesis 1.

[Insert Table 24 about here]

We further inspect the effect of the government guarantee by interacting the guarantee dummy variable with several variables of interest: maturity, credit rating, issue size, and firm size in Table 24. From these interactions, displayed in Model 6 in Table 24, we find that while bid-ask spreads are typically larger for longer-maturity bonds (6.7% increase in bid-ask spread for each year of maturity), this effect is magnified in guaranteed bonds (33.4% increase in bid-ask spread for each year of maturity).[39] This differential in slopes is primarily due to the different scales of guaranteed bonds' bid-ask spreads and non-guaranteed bonds' bid-ask spreads. Specifically, a 33.4% increase in the minuscule bid-ask spreads of guaranteed bonds is actually comparable in dollar terms to a 6.7% increase in the larger bid-ask spreads of non-guaranteed bonds. Larger firms' guaranteed bonds also received a larger boost to liquidity. While firm size had no significant effect on bid-ask spreads of non-guaranteed bonds, we find that a 1% increase in firm size results in a 0.157% decrease in bid-ask spreads of guaranteed bonds.[40] This

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[38] Exp(-1.824) - 1 = -0.8386. Of course, this computation can be repeated for the interpretation of every coefficient from a regression with a dependent variable in log form (Tables 3, 6, and 7).

[39] Exp(0.065) - 1 = 0.067 for non-insured. For insured, the Maturity and Guarantee*Maturity are coefficients are summed such that exp(0.065+0.223) -1 = 0.334.

[40] Since both the explanatory and outcome variables are in log form, we can interpret these coefficients as elasticities.

suggests that investors not only sought the safety of the government guarantee, but the guaranteed bonds of larger banks over those of smaller banks. Surprisingly, the increase in liquidity from a guarantee does not significantly vary by rating or issue size.

Next, we investigate how government guarantees affect bond pricing by regressing the credit spread on a guaranteed bond dummy, interactions with critical variables, and a set of control variables. In addition to examining the effects of debt guarantees on credit spreads, we also estimate an equation where the total cost of debt issuance – in place of credit spread – is considered; specifically, the dependent variable is changed to be the credit spread plus insurance premium. The results for both estimations are in Table 25. To measure bond yield, we exclude floating rate bonds. To ensure accuracy of the TRACE data, we limit our data to yields between 0 and 100 percent. We also limit our observations to those between October 1, 2008 and October 31, 2009 - approximately the issuance window of DGP bonds. There are two samples: one using all bond-day observations, from all credit qualities, and another using only bond-day observations of bonds issued by financial firms (SIC codes between 6000 and 6999). The first sample, analyzed in the odd numbered columns of Table 25, consists of 187,092 bond-day observations from 8,600 bonds. The second sample, analyzed in the even columns of Table 25, consists of 57,902 observations from 3,473 bonds.

In Model 1 of Table 25, we observe guaranteed bonds have yields which are 4.347% lower than their non-guaranteed counterparts (3.287% after accounting for the insurance premium paid to the FDIC). When we limit the sample to bonds of financial firms, we find that yields of guaranteed bonds were actually 6.486% lower (5.451% after accounting for the insurance premium). The greater difference for financial firms may be due to the heightened uncertainty and turmoil in the financial sector during the sample period.

Subsequently, we examine evidence pertaining to Hypothesis 2, which suggests riskier firms receive a larger credit spread reduction from the government guarantee. To do this we analyze the interaction of the guarantee dummy and credit rating in Models 3, 4, 7, and 8 of Table 25. Accordingly, we find riskier firms (a larger *Rating* variable) receive a larger credit spread reduction. This stands to reason in the case of the DGP, as no differential insurance premium for firm risk was charged by the FDIC. In particular, we find that a government guarantee lowers cost of debt by 126 basis points for each additional rating downgrade in Model 4. This offers evidence in favor of Hypothesis 2, and suggests policymakers acted in accordance with financial accelerator concerns in the wake of the 2008 financial crisis. Similarly, benefits were greater during times of heightened market uncertainty. In particular, for a one point increase in the VIX, a government guarantee reduced the credit spread by 12.2 basis points in Model 4, consistent with Hypothesis 3, and lending further credence that policymakers were concerned with financial accelerator effects.

[Insert Table 25 about here]

Table 25 illustrates a negatively-sloped convex credit spread term structure for non-insured bonds. This favors Krishnan et al. (2006). Next, we consider the CSTS of guaranteed bonds where we incorporate the regression coefficient on the interaction of maturity and the guaranteed dummy; we find the slope of the credit spread for guaranteed issuances is not statistically significant.[41]

[41] The slope of the credit spread for guaranteed issuances is estimated as the sum of the given Maturity and Guaranteed*Maturity coefficients. The t-stat for this sum is not significant for Models 3, 4, 7 and 8.

While using a discrete cardinal ratings variable makes interpretation of regression coefficients very simple, credit spreads may not have a linear relationship with issuer credit ratings. As a robustness test, we recreate Model 3 of Table 25 using ratings fixed effects (therefore without the *Rating* and *Junk* variables) as well as an interaction of the *Guaranteed* dummy variable and the ratings fixed effects. The value of these fixed effects, as well as the value of the interaction coefficients are plotted in Figure 3. The slopes of the plotted lines suggest that the cardinal *Rating* variable and the *Junk* dummy variable do a good job of capturing the effect of credit rating on credit spreads. More importantly, we find that the regression coefficients on the other variables are qualitatively similar to those in Model 3 of Table 25.

[Insert Figure 3 about here]

In order to test Hypothesis 4, we split the sample into two default risk-based groups: high-rated firms (with a Standard & Poor's credit rating no lower than AA-), and low-rated firms (with a Standard & Poor's credit rating of BBB+ or lower).[42] The results for these regressions are presented in Table 26.

When we examine Models 1 and 2 in Panel A of Table 26, we see that high-rated firms have insignificant coefficients for maturity and maturity squared; suggesting high-rated firms faced a flat-sloped credit spread term structure without the guarantee. In Models 3 and 4, we see, in contrast, low-rated firms had a highly significant negative maturity coefficient and a similarly significant, but much smaller, coefficient for maturity squared. Thus, low-rated firms faced a negatively-sloped, convex CSTS without the guarantee. This is consistent with Hypothesis 4 suggesting shorter-term guaranteed debt

[42] While we would prefer to use BB or lower, to align with speculative grade bonds, we extend the low rated group in order to have a meaningful sample size in the split-sample regressions.

of riskier firms received a greater credit spread reduction than longer-term debt. Upon analyzing the effect of the guarantee in Models 1 and 3, we find the slope of the CSTS increases more for low-rated firms (64.4 bps) than high-rated firms (12.1 bps). Note, the slope of the CSTS for guaranteed issuances is significantly positive only for high-rated firms (Model 2) when the dependent variable is the sum of the credit spread and the positively-sloped insurance premium in Models 2. This evidence suggests that during the 2008 crisis, riskier bond issuances faced negatively-sloped CSTSs, while safer issuances faced relatively flat CSTSs. Collectively, the dissimilar shapes of CSTS for high versus low credit qualities supports Hypothesis 5. In regard to theories of credit spread term structure behavior during a crisis, this result suggests that the He and Xiong (2012) rollover effect is more supported than the Gorton et al. (2014) effect.

In Panel B of Table 26, we further analyze the CSTS by splitting the sample into quartiles based on the level of the VIX on each bond-day observation. We use a similar procedure to that of Panel A, but rather than using high- and low-rated bonds as the samples, we use bond-day observations in which the VIX level was in the lower and upper quartile of Models 1 and 2, and Models 3 and 4, respectively. In this analysis, we see a similar phenomenon to that found in Panel A. That is, we find that when market conditions are less volatile, the CSTS of non-guaranteed bonds is less negatively sloped than when market conditions are more volatile, as evidenced by the different coefficients on Maturity (-0.242 in Model 1 versus -0.493 in Model 3). Interestingly, we see that the CSTS of guaranteed bonds is more positively sloped during more volatile market conditions than it is during less volatile conditions, as evidenced by much higher coefficients for the guaranteed and maturity interaction terms. In Model 1 (less volatile markets), we find that the slope of guaranteed bonds is positive 11.3 bps per year of maturity while, in strong contrast, the slope of non-guaranteed bonds is negative 24.2 bps per year. Furthermore, in more volatile markets (Model 3) the slope of guaranteed bonds is positive 81.8 bps per year while the slope of non-guaranteed bonds is negative 49.3 bps per year.

[Insert Table 26 about here]

Corporate bonds with no default risk offer a unique opportunity to analyze the magnitudes and term structures of different parts of credit spreads. We use the estimated coefficients of maturity, maturity squared, and the interaction of guaranteed and maturity, (holding the other variables at their means) from the previous regressions to create visual representations of the credit spread, the non-default spread, and the default spread. The non-default spread provides a good estimate of the liquidity spread. Figure 4 uses the sample of bonds used in Tables 25 and 26. Panel A of Figure 4 is illustrative of the full sample from Table 25. The credit spread term structure estimated has a negative slope where, in contrast, the non-default spread is positive. The difference in the two spreads is the default spread which has a negative slope. We note that the default spread is much larger than the insurance premium charged.

[Insert Figure 4 about here]

In Panels B and C of Figure 4, we split the sample into high- and low-rated firms by using the coefficients from regression Models 1 and 3 of Table 26. Interestingly, in Panel B we see high rated firms faced a flat CSTS, but a negatively-sloped default spread. The flat CSTS is a result of summing a relatively gentle negative sloping default spread summed with a positive sloping non-default term structure. For longer maturity issuances, the default spread is nearly equal to the insurance premium charged by the FDIC, which would suggest that higher-rated firms may have had little economic incentive to issue longer maturity guaranteed bonds. In Panel C, for lower-rated firms, we see that both the CSTS and default spreads are clearly negatively sloped and of much greater magnitude than the DGP insurance premium structure. It is interesting to note that the default spread slope is negative but the non-default (liquidity) spread slope is positive. In conjunction, these results suggest weaker (lower-rated) firms received a much greater benefit than safer (higher-rated) firms from the positively-sloped insurance premium structure.

Next, we test whether the government guarantee broadly translated into lower default risk for participating banks, as opposed to merely offering lower default risk for individual insured bonds. To answer this question, we perform a firm-level two-stage least squares (TSLS) analysis on the effects of DGP-induced liquidity on firms' credit default swaps (CDS) spreads. This methodology allows us to measure the effect of liquidity on default risk by using DGP involvement as an exogenous shock to liquidity. It should be noted that DGP involvement is not a perfect instrument for liquidity because DGP involvement is an endogenous choice and possibly influenced by default risk. However, because DGP involvement substantially improves bond-level debt liquidity, as shown earlier, this research design permits us to examine the effects of DGP involvement on default risk through the liquidity channel. This valuable insight allows us to quantify the effect of a government debt guarantee on firm-level default risk. The results provide the first empirical evidence of the endogenous liquidity-default loop proposed by He and Xiong (2012) and He and Milbradt (2014).

In this analysis, we measure firm-level default risk as the midpoint of the bid and ask of the firm's five year CDS spread, collected from Datastream. We measure liquidity two ways. First, as the log of the bid-ask spread of the bonds traded to measure the level of liquidity. Second, as the standard deviation of the bid-ask spread to measure the risk of liquidity, or alternatively, rollover risk – the risk of rolling over maturing debt at a higher cost due to an illiquid market. Clearly, both of these will be a function of default risk. Therefore we instrument for the liquidity measures using the percentage of the firm's bond volume traded on a given day which is insured under the DGP (scaled from 0 to 1). More in-depth variable descriptions are provided in Appendix A.

The results of the TSLS are provided in Table 27. We use a sample of firm-days between September 1, 2008 and December 31, 2008 to capture the peak of new DGP participation and minimize the noise in default risk arising from items outside of DGP involvement. We estimate separate models using the level of liquidity and the volatility of liquidity for all firms and for the sub-sample of financial firms (SIC code in the 6000s). In the first stage of the model, DGP involvement strongly decreases both the level and volatility of the bid-ask spread. If all of the firm's traded bonds are guaranteed, then transaction costs decreased by 66.48% (62.47%) for all (financial) firms.[43] Similarly, if all of the firm's traded bonds are guaranteed, then liquidity risk – the standard deviation of the bid-ask spread – decreased by 32.4 (31.2) bps for all (financial) firms, from Models 2A and 4A, respectively.

In the second stage regressions, we observe the effects of the change in liquidity due solely to the DGP. Since the bid-ask spread and the credit default swap spread are

[43] Exp(-1.093) - 1 = -0.6648; Exp(-0.980) - 1 = -0.6247; taken from models 1A and 3A.

both in log form, we can interpret those models directly as elasticities. Therefore, for a 1% increase in bid-ask spreads, default risk increases by 0.841% (1.305%) for all (financial) firms. From earlier analysis, we know that guaranteed bonds had 83.86% smaller bid-ask spreads. Accordingly, if all of a firm's traded bonds were guaranteed, firm-level default risk would be reduced by 70.53%. This was not the case, as only a very small fraction of a firm's traded bonds were guaranteed. In fact, only 0.396% of firms' daily bond volume was guaranteed on average (and still only 4.7% if we condition on the firm participating in the DGP). Taken in conjunction, this equates to an estimated 4.23% (5.84%) average reduction in default risk for a (financial) firm participating in DGP, or an 8.99 (12.41) basis point reduction in CDS spreads.[44] Using the coefficients in the liquidity risk models (Models 2B and 4B), we estimate a reduction in default risk of 5.27% (4.26%) when a (financial) firm participates in DGP. This evidence supports Hypothesis 5, that debt guarantees decrease default risk for the entire firm, not just the guaranteed debt issues. These findings provide empirical evidence consistent with the theory established by He and Xiong (2012) and He and Milbradt (2014), as the exogenous liquidity improvement provided by the insured bonds reduced debt rollover costs, and ultimately lowered default risk.

[Insert Table 27 about here]

We test the effect of debt guarantees on the liquidity of non-guaranteed bonds (Hypothesis 6) using a difference-in-differences approach to examine the effect of a DGP participation announcement on bid-ask spreads relative to the market. To do this, we regress the natural logarithm of bid-ask spreads on a binary variable indicating DGP

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[44] These figures are calculated using log linear properties of the regression coefficients and the mean 212.49 basis point mean CDS spread.

participation, another binary indicating whether the observation was before or after the announcement of DGP participation[45], and the interaction of the two indicator variables.

We limit the sample to bond-day observations of non-guaranteed bonds between September 1, 2008 and December 31, 2008 in order to capture the high uncertainty during peak months of the financial crisis, but also limit the noise of bid-ask spreads arising from factors other than the DGP. The results of this test are presented in Table 28.

As in previous regressions, we use two samples: one with all firms and one with only financial firms (SIC code in the 6000s). As shown in Model 1 of Table 28, prior to DGP announcement, bonds of DGP participants had 75% larger bid-ask spreads than nonparticipants. However, following announcement of participation, these firms' bonds' bid-ask spreads declined by 16%, consistent with Hypothesis 6. We use control variables in Models 3 and 4 and find that the DGP participants received a statistically significant 11.3% reduction in their bid-ask spreads upon announcing their participation in the guarantee program (significant at the 1 and 10% levels in Models 3 and 4, respectively).[46] This offers conclusive evidence in favor of Hypothesis 6 – the liquidity of previously-issued, non-guaranteed bonds of DGP participants improved relative to the market after the announcement of DGP participation.

[Insert Table 28 about here]

[45] If the issuing firm did not participate in DGP, then we use an event date of October 28, 2008 – the first confirmation of DGP participation.

[46] The coefficients accounting for the 75%, 16% and 11.3% differences in spread are 0.559, -0.177, and -0.120, respectively.

VI. Conclusion

Many economists share a negative opinion about the wisdom or effectiveness of government intervention into financial markets. We study a unique type of government intervention – government guaranteed bank bonds – which we show provides large benefits to bank bond issuers, existing bondholders, bank shareholders, the greater economy, and the guaranteeing agency itself. We analyze these guarantees using FDIC-guaranteed debt under the Debt Guarantee Program (DGP). A primary purpose of a debt guarantee program is to reduce the risk of system failure and curtail financial crises.

Specifically, we find guaranteed bonds are over 83% more liquid (in terms of bid-ask spread) than their non-guaranteed counterparts. Also, the cost of debt for participating firms was reduced more for less liquid, riskier, and shorter-maturity issuances, suggesting policymakers acted in accordance with Bernanke et al. (1996) to assist riskier banks more than safe banks to prevent an exacerbation of credit risk in the financial sector. Importantly, the positively sloped term structure of premia charged was consistent with the idea that it is appropriate to have weaker banks enjoy greater benefits and prevent a financial accelerator effect. This is because weaker firms tend to have a negatively-sloped credit spread. Next, we find the default risk of the average DGP participating firm decreased by approximately 5%, consistent with the endogenous liquidity-default loop models of He and Xiong (2012) and He and Milbradt (2014). Finally, we find preexisting, non-guaranteed bonds increased in liquidity by more than 12% due to the government guarantee. These findings, along with the implications of the financial theory cited in this study, present a convincing case that the guarantee of bank debt may be a suitable instrument of government intervention.

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Appendix A: Chapter 1 Variable Definitions

This appendix lists all the variables used throughout Chapter 1 and Tables 1 through 9, provides their precise definitions, and explains their construction. Voluntary disclosures are hand collected via a Factiva guided search and the remaining principal data sources are Compustat, CRSP, I/B/E/S, RiskMetrics (formerly IRRC), Thomson Financial CDA/Spectrum, and firms' 10-K forms.

Variable	***Definition***
AC	Analyst Coverage. The number of financial analysts following the firm in a particular year.
ATI	The alternative takeover index defined by Cremers and Nair (2005). This index takes a value between 0 and 3 for each given firm by giving one point for each of the three components of the index that the firm has. The three provisions include: blank check preferred, staggered boards, and restrictions on calling special meetings or acting by written consent.
BDIND	The board independence indicator takes the value of 1 if more than 60% of the directors are classified as independent, and 0 otherwise. As in previous research, independent directors are classified as those who are not corporate executives and do not have a business relationship with the company.
BDSIZE	The total number of individuals that serve on the board of directors for a firm in a given year.
DISC-Binary	Voluntary disclosure measure that is binary nature. This variable takes a value of 1 if a particular firm provides a voluntary change in hedging announcement in a given year, and zero otherwise.
DISC-Count	Voluntary disclosure measure that is a count variable. This variable takes the value of the number of hedging voluntary disclosures that a firm provides the market in a particular year.
DISC-Initial	Voluntary disclosure measure that is binary nature. This variable takes a value of 1 if a particular firm provides its first voluntary change in hedging announcement in a given year, and zero otherwise.
DISC-Ratio	Voluntary disclosure measure that is a ratio variable. This measure is defined as the number of disclosures that a particular firm in a certain year provides the market, divided by the total number of disclosures for the entire oil and gas industry in the same year.

Appendix A (*continued*)

DISC-Transparency	Voluntary disclosure measure that is a measure of transparency. This variable is calculated as the number of disclosures that a firm in a given year provides the market, divided by the time series volatility of hedge ratio changes for that firm during the announcement sample period. If the firm does not make an announcement during time t, then the value is set to 0.
DISP	This variable is the analyst forecast dispersion in a particular year. It is measured as the standard deviation of one-year-ahead earnings per share (EPS) forecasts scaled by the absolute mean forecast; accordingly, I use the most recent consensus forecast before the end of year.
E-Index	The entrenchment index was created by Bebchuk, Cohen, and Ferrell (2009). The level of the entrenchment index for any given firm is calculated by giving one point for each of the six provisions related to the index that the firm has. The six provisions are: staggered board, limits to amend bylaws, limits to amend charter, supermajority, golden parachutes, and poison pill.
G-Index	The governance index was created by Gompers, Ishii, and Metrick (2003). The level of the governance index for any given firm is calculated by giving one point for each of the twenty four provisions related to the index that the firm possesses. The twenty four provisions are: Antigreen mail, blank check, business combination law, cash-out law, compensation plans, director duties, director indemnification, director indemnification contracts, director liability, fair price, golden parachutes, limits to amend bylaws, limits to amend charter, limits to special meeting, limits to written consent, no cumulative vote, no secret ballot, pension parachutes, poison pill, severance agreements, silver parachutes, staggered board, supermajority, and unequal vote.
ΔHEDGER-Binary	Indicator variable that the firm has changed its hedge ratio for the particular year.
INST	Indicator takes the value of 1 if institutional investors own more than 66% of total number of common shares outstanding. The total percentage of the firm that is owned by institutional investors as reported by Thomson Financial CDA/Spectrum database for a given year.
Leverage	Calculated as the book value of long-term debt divided by the sum of book values of preferred stock, common equity, and long-term debt. **The specific Compustat variables associated with the variable definition are as follows: book value of long-term debt is DLTT, book value of preferred stock is PSTK, and book value of common equity is CEQ.*

Appendix A (*continued*)

MTB	Market-to-book ratio is the book value of total assets, minus book value of common equity, plus market value of equity, divided by book value of total assets. **The specific Compustat variables associated with the variable definition are as follows: book value of total assets is AT, book value of common equity is CEQ, and the market value of equity is multiplication of CSHO and PRCC_F.*
QR	Quick ratio for the firm is defined by the ratio: (cash + cash equivalents + receivables) / current liabilities. **The specific Compustat variables associated with the variable definition are as follows: cash and cash equivalents is CHE, receivables is RECT, and current liabilities is LCT.*
ROA	Return on assets for the firm. This variable is calculated as the ratio of net income to assets. **The specific Compustat variables associated with the variable definition are as follows: net income is NI and book value of total assets is AT.*
RVOL	Equity return volatility for the firm. This variable is measured as the standard deviation of daily stock returns in a particular year.
Size	The natural logarithm of the market value of assets. The market value of assets equals book value of assets, minus book value of common stock, plus market value of equity. **The specific Compustat variables associated with the variable definition are as follows: net income is NI and book value of total assets is AT.*
TLCF	Tax loss carry forwards for a firm. The measure takes a value of 1 if firm has tax loss carry forwards, zero otherwise. **The specific Compustat variable associated with the variable definition is as follows: Tax loss carry forwards is TLCF.*
TXFO	Foreign tax credits for the firm. The measure takes the value of 1 if firm has foreign tax credits, zero otherwise. I use the amount of current foreign taxes payable as the measure of foreign tax credit. Following prior literature, I set missing value to zero. **The specific Compustat variable associated with the variable definition is as follows: foreign income taxes is TXFO.*

Appendix B: Chapter 2 Variable Definitions

This appendix lists all the variables used throughout Chapter 2 and Tables 10 through 21, provides their precise definitions, and explains their construction.

Variable	*Definition*
AGE	The age of the firm in years is measured as the number of years the firm is reported in the COMPUSTAT Fundamentals Annual – same year as observation.
CAR	The market adjusted value-weighted cumulative abnormal return for the window of -5 days to +5 days surrounding the dividend initiation announcement.
Cash/TA	Measure the cash and short-term securities of the firm. This variable is CHEQ (COMPUSTAT), which is the cash and short-term investments. It is then adjusted by the total assets of the firm (ATQ)
EBITDA/TA	Measured as the operating income before depreciation (OIBDPQ) and adjusted by the total assets of the firm (ATQ).
High Institutional Holding	Binary variable that takes the value of one if the firm is located within the highest quartile in terms of institutional holdings the year preceding the dividend initiation announcement, zero otherwise.
Institutional Holdings	Measured as the ratio of shares held by institutional investors relative to total shares outstanding in yearend reports for institutional holdings obtained from CDA/Spectrum 13F Holdings database.
Log (# of Dividend Firms)	Measured as the log (number of dividend paying firms). This variable measures the number of dividend paying firm observations associated with each dividend initiation that is included in the final sample.
Log(# of Firms)	Measured as the log (number of firms). This variable requires that at least 10 firms per dividend initiation are included in the final sample.
Log(Population)	Measured as the log (population estimate), this population estimate is obtained from the U.S. Census Bureau. This variable is observation specific for year and MSA. – same year as observation
Low Institutional Holding	Binary variable that takes the value of one if the firm is not located within the highest quartile in terms of institutional holdings the year preceding the dividend initiation announcement, zero otherwise.
Payer	Binary variable that takes the value of one if the firm within the sample is a dividend payer the quarter prior to the dividend announcement, zero otherwise.

Appendix B (*continued*)

Sales	Measured as the log (1+SALEQ), where SALEQ is the COMPUSTAT variable for sales/turnover (net) and has been adjusted to 1990 dollars.
Senior	The percentage of the population of the MSA that is over the age of 64, this variable was obtained from the U.S. Census Bureau. – same year as observation
Senior Citizen	Binary variable that takes the value of one if the firm is located within the highest quartile in terms of persons over 65 compared to the overall population of the MSA, zero otherwise.
Size	Measured as the log (1+ATQ), where ATQ is the COMPUSTAT variable for total assets and has been adjusted to 1990 dollars.
State Unemployment Rate	The state unemployment rate for the firm observation in the sample by year; obtained from the U.S. Bureau of Labor Statistics – same year as observation.
Stock Return	This is the firm's previous quarter returns as measured by the monthly CRSP file.
Tobin's Q	Derived as (ATQ – CEQQ + absolute value (PRCCQ*CSHOQ))/ATQ. Where ATQ is the total assets of the firm, CEQQ is the total common/ordinary equity, PRCCQ is the closing price of the firm's stock at the end of the quarter, and CSHOQ is the firm's common shares outstanding.
Top 20 City	Binary variable that takes the value of one if the firm is located within one of the 20 most populous cities as measured by the U.S. Census Bureau from 1980-2011, resulting in a total of 25 different cities, zero otherwise.
Total Debt/TA	This variable captures both short and long-term debt of the firm. It is measured by adding debt in current liabilities (DLCQ) and long-term debt (DLTTQ); then it is adjusted by the total assets of the firm (ATQ).

Appendix C: Chapter 3 Variable Definitions

This appendix lists all the variables used throughout Chapter 3 and Tables 22 through 28, provides their precise definitions, and explains their construction.

Panel A: Bond-Level Variables

Variable	*Definition*
Bond Age	The bond age is calculated as the difference in the trade execution date from TRACE and the offering date from Mergent FISD, scaled by 365 days.
Coupon Rate	The coupon rate is gathered from Mergent FISD for all fixed-coupon bonds, and assigned a 0 for all zero coupon bonds. This value is missing for all floating-rate bonds.
Floating Dummy	The Floating Dummy is a binary variable equal to 1 for variable rate bond issuances and 0 otherwise.
Guaranteed Dummy	The Guaranteed Dummy is a binary variable equal to 1 for a bond issuance guaranteed by the FDIC under the Debt Guarantee Program and 0 otherwise.
Ln(Bid-Ask Spread)	Following Hong and Warga (2000), the bid-ask spread is estimated using TRACE data each day, by finding the volume-weighted average buy price and sell price, and then finding the difference in the buy and sell prices, scaled by the mid-point of the two prices. The bid-ask spreads are then winsorized at the 1st and 99th percentiles. We then take the natural log of the estimated bid-ask spread.
Ln(Issue Size)	Ln(Issue Size) is the natural log of the size of the bond issue (defined as the sum of the offering amount and action amount per Mergent FISD) scaled by $1 million.
Maturity	The maturity is defined as the maturity date (from Mergent FISD) minus the trade execution date (from TRACE), scaled by 365.
Maturity^2	The square of Maturity.
Premium	Premium is the insurance premium the issuing firm paid to the FDIC in exchange for the guarantee. This is calculated according to Table 1.
Price	The daily price of the bond is calculated as the volume weighted average of the bond price from trades over the day, following Bessembinder, Kahle, Maxwell, and Xu (2009).
Total Cost	The total cost of debt issuance is calculated as the sum of the yield spread and the insurance premium.

Appendix C (*continued*)

Yield	The yield is calculated for each bond-day observation of fixed- or zero-coupon bonds using the interest frequency, coupon, and maturity from Mergent FISD, the settlement date (three business days after the trade date) and the weighted average daily bond price gathered from TRACE. The decimal yield is finally multiplied by 100.
Yield Spread	The yield spread is calculated as the difference in the yield of a bond and the interpolated treasury yield, based on maturity.

Panel B: Firm-Level Variables

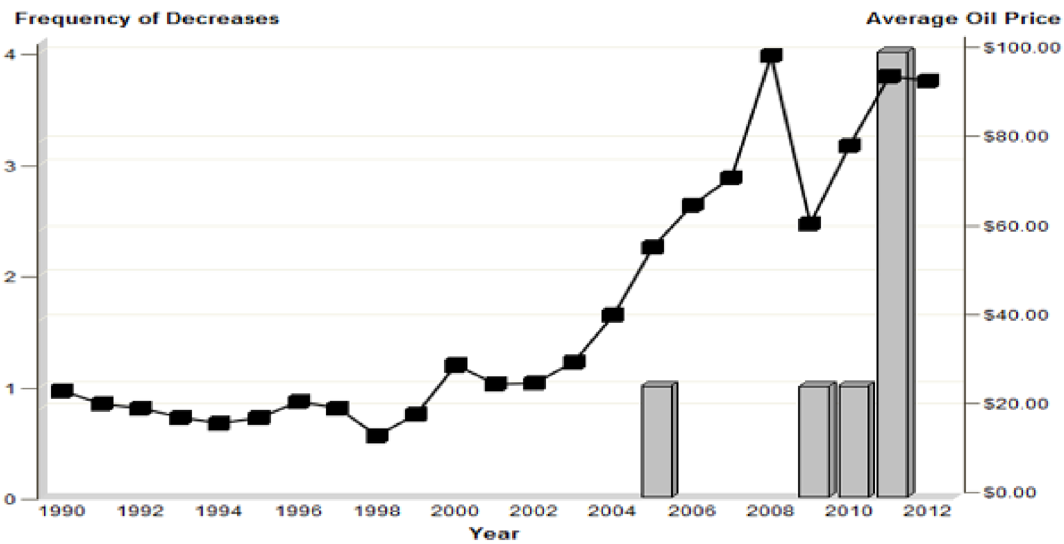
% Guaranteed Volume	The percent of the firm's bond volume trading on a given day is guaranteed under the Debt Guarantee Program.
DGP Firm Dummy	The DGP Firm dummy is a binary variable equal to 1 if the issuing parent firm is a DGP-participating firm, and 0 otherwise.
Leverage	Leverage of the issuing firm is calculated from COMPUSTAT as the sum of total current liabilities (DLC) and total long term liabilities (DLTT), scaled by total assets (AT).
Ln(Bid-Ask Spread)	The natural log of the volume-weighted bid-ask spread of each of the firm's bonds traded on a given day.
Ln(CDS)	The natural log of the mid-quote (average of bid and ask) spread of the firm's 5 year credit default swap, collected from Datastream.

Appendix D: Figures and Tables

Figure 1: Oil and Gas Prices with the Yearly Distribution of Hedging Announcement

The figure in Panel A (B) below shows the yearly distribution of oil specific voluntary disclosures related to corporate hedging decreases (increases) by oil and gas firms (SIC Code = 1311) and the average oil price between January 1990 and January 2013. The figure in Panel C (D) below shows the yearly distribution of natural gas specific voluntary disclosures related to corporate hedging decreases (increases) by oil and gas firms (SIC Code = 1311) and the average natural gas price between January 1990 and January 2013.

Panel A: Oil Decrease Announcements



Panel B: Oil Increase Announcements

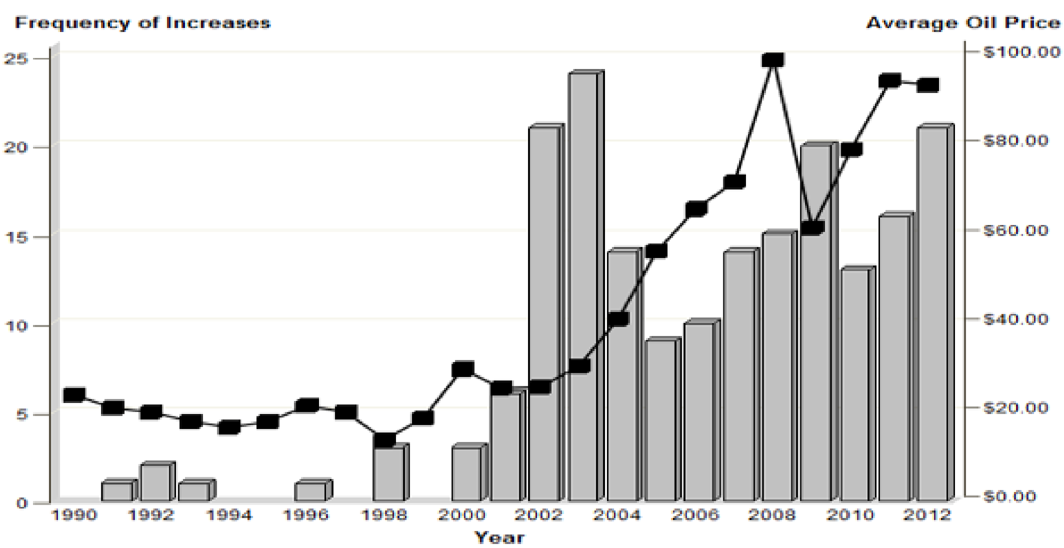
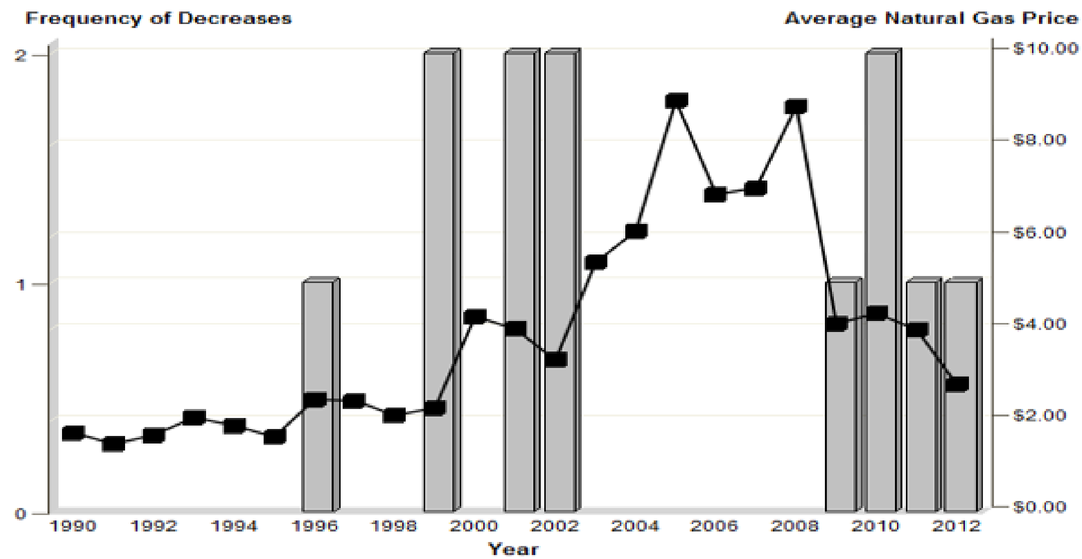


Figure 1 (*continued*)

Panel C: Gas Decrease Announcements



Panel D: Gas Increase Announcements

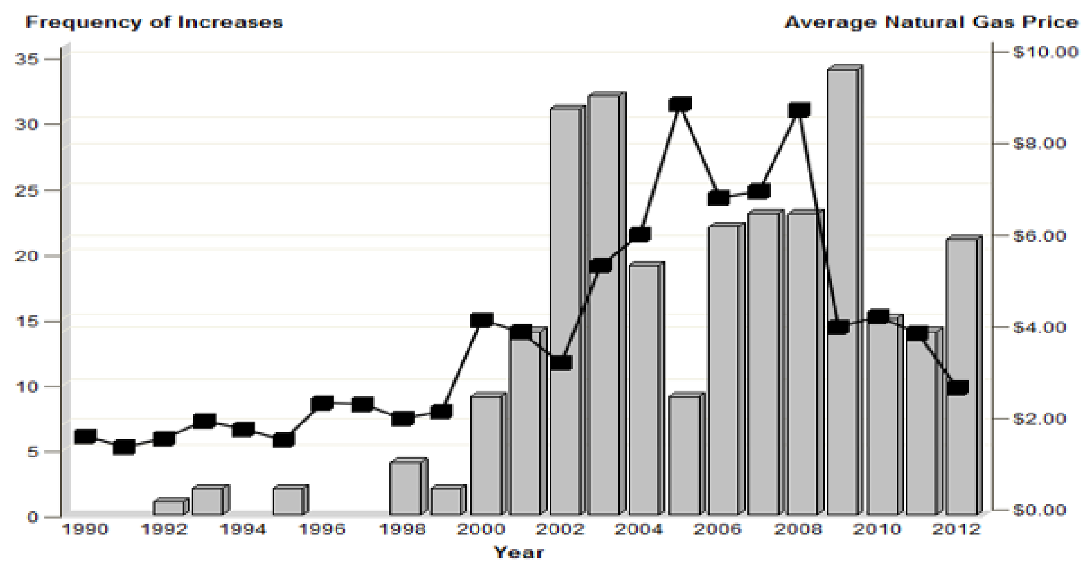


Table 1: Announcement Event Descriptive and Event Characteristics

This table presents the descriptive statistics of the announcement and event characteristics for corporate hedging announcement by oil and gas firms (SIC Code = 1311) between January 1991 and January 2013. Panel A displays the announcements identified as *Contemporaneous* (*Non-Contemporaneous*) when there are other (no other) firm-specific news items between disclosure days -1 and +1. Panel B represents the reason identified for the change in hedging policy for the announcement. A disclosure is categorized as *Market View* when the firm making the hedging-related announcement explicitly claims that the change in hedging policy is a result of its expectations about future oil and/or gas prices. Announcements are identified as a *Bank Loan* observation when the change in hedging policy is a consequence of a loan-related transaction. Any remaining observations are recognized as *Other* observations for the reason for change in hedging policy. Panel C shows the timing of the change in hedging policy relative to the time of the announcement for the announcements. Disclosures are categorized as *Ex ante* (*Ex post*) when the change in hedging policy is announced in advance of (subsequent to) its implementation.

	Oil - Decreases	Gas - Decreases	Oil - Increases	Gas - Increases	Total
Panel A: Contemporaneous vs. Non-Contemporaneous					
Contemporaneous	6	10	159	222	397
Non-Contemporaneous	1	2	35	55	93
Total	7	12	194	277	490
Panel B: Reason for Change in Hedging Policy					
Market View	0	3	50	78	131
Bank Loans	2	0	17	25	44
Other	5	9	127	174	315
Total	7	12	194	277	490
Panel C: Timing of the Change in Hedging Policy relative to Announcement					
Ex ante	2	3	7	7	19
Ex post	5	9	187	270	471
Total	7	12	194	277	490

Table 2: Summary Statistics, Chapter 1

This table reports summary statistics for the oil and gas firms (SIC Code =1311) between January 1991 and January 2013 used in the analysis. *G-Index* is the governance index from Gompers, Ishii, and Metrick (2003), *E-Index* is the entrenchment index from Bebchuck, Cohen, and Ferrell (2009), and *ATI* is the alternative takeover provision index from Cremers and Nair (2005). *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, and *DISP* is the analyst forecast dispersion for the respective firms. *MTB* is the market-to-book ratio, *QR* is the firm's quick ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, *TLCF* is defined as the tax loss carry forward, and *TXFO* is a proxy for foreign tax credits. Panel A reports descriptive statistics of selected variables used throughout. Panel B contains summary statistics for the three sub-groups identified in the oil and gas industry: (1) firms that do not hedge and therefore do not disclose changes in hedging policy, (2) firms that hedge and do NOT disclose changes in hedging policy, and (3) firms that hedge and disclose changes in hedging policy. The notation ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively, in the differences in means and medians of the variables between the three sub-samples using the t-test for means and Wilcoxon signed rank-sum test for medians. The variables in the table are defined in Appendix A.

Panel A: Entire Sample

Variable	*N*	Mean	Median	Std	P25	P75
DISC-Binary	417	0.1679	0	0.3742	0	0
DISC-Count	417	0.4868	0	1.4313	0	0
DISC-Ratio	417	0.014	0	0.0414	0	0
DISC-Transparency	417	5.3649	0	16.3963	0	0
ATI	417	2.2278	2	0.7617	2	3
E-Index	417	2.2806	2	1.3285	1	3
G-Index	269	9.4349	9	2.0038	8	11
AC	417	16.9544	16	7.8275	10	23
BDIND	417	0.7842	1	0.4119	1	1
BDSIZE	417	9.1295	9	2.1264	7	11
DISP	417	0.0051	0.0027	0.0062	0.0016	0.0053
Leverage	417	0.4056	0.4098	0.1665	0.2816	0.5257
MTB	417	1.4714	1.4249	0.362	1.1913	1.693
QR	417	0.7994	0.7526	0.3356	0.5533	0.9829
ROA	417	0.039	0.05	0.069	0.0108	0.084
RVOL	417	0.0282	0.0247	0.0117	0.0191	0.0346
Size	417	8.6383	8.5253	1.3231	7.5855	9.7228
TLCF	417	0.4484	0	0.4979	0	1
TXFO	417	0.4748	0	0.5	0	1

Table 2 (*continued*)

Panel B: Differences in Means and Medians by Group

	(1) Non Ann & Non ΔHedge		*(2) Non Ann & ΔHedge*		*(3) Announcing*	
Variable	Mean	Median	Mean	Median	Mean	Median
ATI	2.1575	2	2.25	2	2.2857	3
E-Index	1.937	2	2.3136	2	2.8	4
G-Index	9.4205	9	9.2676	9	10.0769	11
AC	15.6378	15	17.7182	17	16.9429	25
BDIND	0.811	1	0.8091	1	0.6571	1
BDSIZE	9.5512	9	9.0636	9	8.5714	10
DISP	0.0058	0.003	0.0046	0.0025	0.0049	0.0055
Leverage	0.401	0.4033	0.3963	0.3962	0.4428	0.5519
MTB	1.4846	1.4514	1.4889	1.4511	1.3921	1.5831
QR	0.801	0.7526	0.81	0.7621	0.7634	0.9475
ROA	0.0405	0.0529	0.0387	0.0475	0.0373	0.0894
RVOL	0.0268	0.0238	0.028	0.0237	0.0316	0.0369
Size	8.6846	8.563	8.6865	8.6069	8.4027	9.3776
TLCF	0.4961	0	0.3955	0	0.5286	1
TXFO	0.5197	1	0.5045	1	0.3	1
	Difference (1&2)		*Difference (1&3)*		*Difference (2&3)*	
Variable	Mean	Median	Mean	Median	Mean	Median
ATI	-0.0925	0	-0.1282	-1	-0.0357	-1
E-Index	-0.3766**	0***	-0.863***	-2***	-0.4864***	-2***
G-Index	0.1529	0	-0.6564*	-2	-0.8093**	-2**
AC	-2.0804**	-2**	-1.3051	-10	0.7753	-8
BDIND	0.0019	0	0.1539**	0**	0.152***	0***
BDSIZE	0.4876**	0*	0.9798***	-1***	0.4922*	-1*
DISP	0.0012*	0.0005*	0.0009	-0.0025	-0.0003	-0.003*
Leverage	0.0047	0.0071	-0.0418*	-0.1486*	-0.0465**	-0.1557**
MTB	-0.0043	0.0003	0.0925	-0.1317	0.0968**	-0.132**
QR	-0.009	-0.0095	0.0376	-0.1949	0.0466	-0.1854
ROA	0.0018	0.0054	0.0032	-0.0365	0.0014	-0.0419
RVOL	-0.0012	0.0001	-0.0048***	-0.0131***	-0.0036**	-0.0132***
Size	-0.0019	-0.0439	0.2819	-0.8146	0.2838	-0.7707*
TLCF	0.1006*	0*	-0.0325	-1	-0.1331*	-1*
TXFO	0.0152	0	0.2197***	0***	0.2045*	0***

Table 3: G-Index and Voluntary Disclosure Regressions

This table contains the results of regression specifications conducted to analyze the relation between the *G-Index* and various measures of voluntary disclosures made by oil and gas mining firms (SIC Code = 1311) between January 1991 and January 2013. Panel A reflects equation model (1) provided in the paper and includes the entire sample of firms. Column 1 is a logit regression specification with the *DISC-Binary* measure as the dependent variable and marginal effects are provided in column 2. Column 3 is the Poisson regression specification with the *DISC-Count* variable as the dependent variable with marginal effects in column 4. Column 5 exhibits the GLM fractional logit regression specification appropriate for the *DISC-Ratio* variable as the dependent variable with marginal effects listed in column 6. Column 7 reports the Tobit regression specification with a lower limit of 0 for the dependent variable of *DISC-Transparency*. Panel B contains the two-step Heckman selection models. Column 1 is the first-stage logit regression that models the probability of a firm having a hedge ratio in year *t* and marginal effects are provided in column 2. Columns 3, 5, 7, and 9 reflect the second stage of the Heckman regression analysis and models the effects of the governance index on the voluntary disclosure measure conditional that the firm has a hedge ratio. The dependent variables in order are *DISC-Binary, DISC-Count, DISC-Ratio*, and *DISC-Transparency* in the appropriate regression estimation, followed by the marginal effects, respectively. *G-Index* is the governance index from Gompers, Ishii, and Metrick (2003). *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, and *DISP* is the analyst forecast dispersion for the respective firms. *MTB* is the market-to-book ratio, *QR* is the firm's quick ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, *TLCF* is defined as the tax loss carry forward, *TXFO* is a proxy for foreign tax credits, and *Size* is the size of the firm. Δ*HEDGE* is an indicator variable that the firm has changed its hedge ratio for the particular year. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

Table 3 (*continued*)

Panel A: Entire Oil and Gas Sample Regression Analysis – *G-Index*

	(1) Logit DISC-Binary	(2) Marginal Effects	(3) Poisson DISC-Count	(4) Marginal Effects	(5) Fractional DISC-Ratio	(6) Marginal Effects	(7) Tobit LL(0) DISC-Transparency
G-Index	0.2628***	0.0283	0.2685***	0.1062	0.3094***	0.0037	11.4143***
	[3.2865]		[4.0658]		[3.6956]		[3.7209]
MTB	-1.7557**	-0.1892	-2.2754**	-0.9002	-1.6211*	-0.0193	-51.3527***
	[-2.5195]		[-2.2576]		[-1.6729]		[-2.8501]
ROA	10.7469**	1.1579	10.6908**	4.2293	10.6252***	0.1268	462.9321***
	[2.4582]		[2.2928]		[2.9235]		[3.3733]
Size	-0.173	-0.0186	-0.5197*	-0.2056	-0.5045	-0.006	-4.0785
	[-0.8523]		[-1.6821]		[-1.3391]		[-0.8879]
AC	0.0203	0.0022	0.0361*	0.0143	0.0489	0.0006	0.9922
	[1.0880]		[1.8302]		[1.5022]		[1.5317]
BDIND	-0.9427*	-0.1016	-0.393	-0.1555	-0.3196	-0.0038	-35.2801***
	[-1.9512]		[-1.3198]		[-0.6097]		[-3.6191]
BDSIZE	-0.0441	-0.0047	-0.0865	-0.0342	-0.0391	-0.0005	-2.0095
	[-0.5601]		[-1.2493]		[-0.3669]		[-0.7594]
DISP	-69.7363	-7.5134	-107.2579***	-42.4317	-79.3679**	-0.9469	-2782.7886**
	[-1.6285]		[-3.5857]		[-2.2313]		[-1.9848]
RVOL	58.5868*	6.3122	42.0860**	16.6494	62.1588**	0.7416	1942.3212**
	[1.8507]		[1.9950]		[2.2252]		[2.3843]
N	273		273		273		273
pseudo R^2	0.1250		0.1887				0.0848

Table 3 (*continued*)

Panel B: Heckman (1979) Two-Stage Regression Analysis – *G-Index*

	(1) Logit ΔHEDGE	(2) Marginal Effects	(3) Logit DISC-Binary	(4) Marginal Effects	(5) Poisson DISC-Count	(6) Marginal Effects	(7) Fractional DISC-Ratio	(8) Marginal Effects	(9) Tobit LL(0) DISC-Transparency
G-Index			0.5144*** [3.7513]	0.0721	0.5285*** [12.9592]	0.3153	0.5712*** [4.9653]	0.0101	17.2187*** [5.0421]
MTB	-0.1822 [-0.3286]	-0.0382	-1.1226* [-1.6588]	-0.1573	-1.3317* [-1.8742]	-0.7946	-0.704 [-0.8871]	-0.0124	-30.2970* [-1.7210]
ROA			11.6303* [1.8921]	1.6301	11.6050** [2.2215]	6.9246	12.5416*** [3.1100]	0.2214	461.9284*** [3.2003]
Size	0.0207 [0.1779]	0.0043	-0.0131 [-0.0451]	-0.0018	-0.3768 [-1.1092]	-0.2248	-0.4511 [-1.1588]	-0.008	-3.4954 [-0.6809]
AC			-0.0165 [-0.6373]	-0.0023	0.0085 [0.3002]	0.005	0.0303 [0.7839]	0.0005	0.2499 [0.4250]
BDIND			-1.3811** [-2.5142]	-0.1936	-0.7689*** [-2.8379]	-0.4588	-0.7293 [-1.5612]	-0.0129	-37.2200*** [-4.6712]
BDSIZE			-0.0398 [-0.4699]	-0.0056	-0.1122* [-1.9236]	-0.0669	-0.0793 [-0.8682]	-0.0014	-1.8608 [-0.7129]
DISP			-108.0516*** [-3.5486]	-15.1445	-147.5570*** [-5.9515]	-88.0451	-115.8938*** [-3.0594]	-2.0459	-3463.8643*** [-3.5437]
RVOL			77.4761** [2.3865]	10.8591	56.1518*** [3.3015]	33.5049	70.6634** [2.5241]	1.2474	2118.7168*** [3.4402]
TLCF	-0.3344** [-2.1042]	-0.0701							
TXFO	-0.3641 [-1.0340]	-0.0763							
Leverage	0.0907 [0.0760]	0.019							
QR	0.0156 [0.0414]	0.0033							
Mills Ratio			-4.5953** [-2.5556]	-0.6441	-5.7767*** [-4.2946]	-3.4469	-6.0096** [-2.4726]	-0.1061	-90.8070** [-2.5914]
N	417		181		181		181		181
pseudo R^2	0.0084		0.1577		0.2402				0.0967

Table 4: E-Index and Heckman (1979) Two-Stage Selection Model

This table contains the results of regression specifications conducted to analyze the relation between the *E-Index* and various measures of voluntary disclosures made by oil and gas mining firms (SIC Code = 1311) between January 1991 and January 2013. This table contains the two-step Heckman selection models. Column 1 is the first-stage logit regression that models the probability of a firm having a hedge ratio in year *t* and marginal effects are provided in column 2. Columns 3, 5, 7, and 9 reflect the second stage of the Heckman regression analysis and models the effects of the governance index on the voluntary disclosure measure conditional that the firm has a hedge ratio. The dependent variables in order are *DISC-Binary, DISC-Count, DISC-Ratio*, and *DISC-Transparency* in the appropriate regression estimation followed by the marginal effects, respectively. *E-Index* is the governance index from Bebchuk, Cohen, and Ferrell (2009). *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, and *DISP* is the analyst forecast dispersion for the respective firms. *MTB* is the market-to-book ratio, *QR* is the firm's quick ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, *TLCF* is defined as the tax loss carry forward, *TXFO* is a proxy for foreign tax credits, and *Size* is the size of the firm. Δ*HEDGE* is an indicator variable that the firm has changed its hedge ratio for the particular year. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

Table 4 (*continued*)

Heckman (1979) Two-Stage Regression Analysis – *E-Index*

	(1) Logit ΔHEDGE	(2) Marginal Effects	(3) Logit DISC-Binary	(4) Marginal Effects	(5) Poisson DISC-Count	(6) Marginal Effects	(7) Fractional DISC-Ratio	(8) Marginal Effects	(9) Tobit LL(0) DISC-Transparency
E-Index			0.4078***	0.0666	0.5464***	0.3825	0.5833***	0.0113	16.0568***
			[3.1083]		[3.8963]		[5.1928]		[3.9894]
MTB	-0.1822	-0.0382	-0.8918	-0.1457	-0.6012	-0.4209	-0.1231	-0.0024	-21.5653
	[-0.3286]		[-1.2874]		[-1.1033]		[-0.2509]		[-1.0246]
ROA			5.4406	0.8888	4.9779*	3.4846	5.5955**	0.1086	202.8948
			[1.2831]		[1.6651]		[2.3005]		[1.5733]
Size	0.0207	0.0043	-0.2834	-0.0463	-0.5508***	-0.3856	-0.6827***	-0.0133	-11.0414**
	[0.1779]		[-1.5261]		[-3.2063]		[-3.3794]		[-2.2382]
AC			0.0261	0.0043	0.0517***	0.0362	0.0719***	0.0014	1.2172**
			[1.1170]		[3.3071]		[3.0492]		[1.9869]
BDIND			-1.0259***	-0.1676	-0.6669**	-0.4668	-0.5845*	-0.0113	-21.9693**
			[-2.6870]		[-2.3857]		[-1.8785]		[-2.0932]
BDSIZE			-0.082	-0.0134	-0.0432	-0.0302	0.0109	0.0002	-1.8563
			[-1.1370]		[-0.6126]		[0.1208]		[-0.8473]
DISP			-31.5799	-5.1591	-15.963	-11.1741	7.3767	0.1432	-880.3479
			[-1.2548]		[-0.7007]		[0.3319]		[-0.9124]
RVOL			10.0549	1.6426	-13.2974	-9.3082	-9.2866	-0.1803	260.1329
			[0.4735]		[-0.8879]		[-0.7415]		[0.3768]
TLCF	-0.3344**	-0.0701							
	[-2.1042]								
TXFO	-0.3641	-0.0763							
	[-1.0340]								
Leverage	0.0907	0.019							
	[0.0760]								
QR	0.0156	0.0033							
	[0.0414]								
Mills Ratio			-2.1152**	-0.3455	-3.6033**	-2.5223	-3.4515**	-0.067	-49.4244
			[-2.3404]		[-2.4644]		[-2.2089]		[-1.1498]
N	417		290		290		290		290
pseudo R^2	0.0084		0.0951		0.1500				0.0384

Table 5: ATI and Heckman (1979) Two-Stage Selection Model

This table contains the results of regression specifications conducted to analyze the relation between the *ATI* and various measures of voluntary disclosures made by oil and gas mining firms (SIC Code = 1311) between January 1991 and January 2013. This table contains the two-step Heckman selection models. Column 1 is the first-stage logit regression that models the probability of a firm having a hedge ratio in year *t* and marginal effects are provided in column 2. Columns 3, 5, 7, and 9 reflect the second stage of the Heckman regression analysis and models the effects of the governance index on the voluntary disclosure measure conditional that the firm has a hedge ratio. The dependent variables in order are *DISC-Binary, DISC-Count, DISC-Ratio*, and *DISC-Transparency* in the appropriate regression estimation followed by the marginal effects, respectively. *ATI* is the alternative takeover provision index from Cremers and Cohen (2005). *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, and *DISP* is the analyst forecast dispersion for the respective firms. *MTB* is the market-to-book ratio, *QR* is the firm's quick ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, *TLCF* is defined as the tax loss carry forward, *TXFO* is a proxy for foreign tax credits, and *Size* is the size of the firm. Δ*HEDGE* is an indicator variable that the firm has changed its hedge ratio for the particular year. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

Table 5 (*continued*)

Heckman (1979) Two-Stage Regression Analysis – *ATI*

	(1) Logit ΔHEDGE	(2) Marginal Effects	(3) Logit DISC-Binary	(4) Marginal Effects	(5) Poisson DISC-Count	(6) Marginal Effects	(7) Fractional DISC-Ratio	(8) Marginal Effects	(9) Tobit LL(0) DISC-Transparency
ATI			0.1834	0.0311	0.1200	0.084	0.1835	0.0036	9.2998
			[0.9877]		[0.7540]		[0.9485]		[1.4333]
MTB	-0.1822	-0.0382	-1.0213	-0.1731	-0.8798	-0.6159	-0.3639	-0.0071	-27.5455
	[-0.3286]		[-1.5956]		[-1.3318]		[-0.6291]		[-1.3539]
ROA			4.1555	0.7042	3.3101	2.3171	3.5454	0.0694	154.7247
			[0.9299]		[0.9810]		[1.5384]		[1.0822]
Size	0.0207	0.0043	-0.1257	-0.0213	-0.2972*	-0.208	-0.3828**	-0.0075	-5.2085
	[0.1779]		[-0.8684]		[-1.9465]		[-2.0307]		[-1.0182]
AC			0.0183	0.0031	0.0392**	0.0274	0.0549**	0.0011	0.9871*
			[0.8858]		[2.4120]		[2.5150]		[1.6930]
BDIND			-0.8577*	-0.1454	-0.4623	-0.3236	-0.3826	-0.0075	-19.7442
			[-1.8986]		[-1.4063]		[-1.0677]		[-1.5145]
BDSIZE			-0.1035	-0.0175	-0.0741	-0.0518	-0.0237	-0.0005	-2.8938
			[-1.4275]		[-1.0366]		[-0.2751]		[-1.1751]
DISP			-28.5747	-4.8426	-14.8385	-10.3869	5.2014	0.1019	-845.722
			[-1.0751]		[-0.5226]		[0.2133]		[-0.7143]
RVOL			21.0033	3.5595	2.2782	1.5947	7.338	0.1437	785.7985
			[1.0644]		[0.1482]		[0.5703]		[1.1472]
TLCF	-0.3344**	-0.0701							
	[-2.1042]								
TXFO	-0.3641	-0.0763							
	[-1.0340]								
Leverage	0.0907	0.019							
	[0.0760]								
QR	0.0156	0.0033							
	[0.0414]								
Mills Ratio			-1.7804*	-0.3017	-3.2511**	-2.2758	-3.0381*	-0.0595	-44.6217
			[-1.8768]		[-1.9923]		[-1.7237]		[-0.9760]
N	417		290		290		290		290
pseudo R^2	0.0084		0.0653		0.0712				0.0201

Table 6: Second-Stage Institutional Regressions

This table contains the results of regression specifications conducted to analyze the relation between the *G-Index, E-Index,* and *ATI* with the inclusion of institutional ownership (*INST*) and various measures of voluntary disclosures made by oil and gas mining firms (SIC Code = 1311) between January 1991 and January 2013. All results presented are reflective of the second stage of the Heckman (1979) two-step selection model. The other regressions are not provided for brevity, but are available upon request. Columns 1, 5, and 9 are logit regression specifications with the *DISC-Binary* measure as the dependent variable. Columns 2, 6, and 10 are the Poisson regression specifications with the *DISC-Count* variable as the dependent variable. Columns 3, 7, and 11 exhibit the GLM fractional logit regression specifications appropriate for the *DISC-Ratio* variable as the dependent variable. Columns 4, 8 and 12 report the Tobit regression specifications with a lower limit of 0 for the dependent variable of *DISC-Transparency*. *G-Index* is the governance index from Gompers, Ishii, and Metrick (2003). *E-Index* is the governance index from Bebchuk, Cohen, and Ferrell (2009). *ATI* is the alternative takeover provision index from Cremers and Cohen (2005). Control variables include: *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, *DISP* is the analyst forecast dispersion for the respective firms, *MTB* is the market-to-book ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, and *Size* is the size of the firm. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

Table 6 (*continued*)

	(1) Logit DISC-Binary	(2) Poisson DISC-Count	(3) Fractional DISC-Ratio	(4) Tobit LL(0) DISC-Transparency	(5) Logit DISC-Binary	(6) Poisson DISC-Count	(7) Fractional DISC-Ratio	(8) Tobit LL(0) DISC-Transparency	(9) Logit DISC-Binary	(10) Poisson DISC-Count	(11) Fractional DISC-Ratio	(12) Tobit LL(0) DISC-Transparency
G-Index	0.4539***	0.4729***	0.5238***	15.2056***								
	[3.0918]	[10.5900]	[4.5359]	[4.2775]								
E-Index					0.3593***	0.4783***	0.5435***	14.4156***				
					[2.7432]	[3.8426]	[5.0254]	[3.9939]				
ATI									0.0621	0.1075	0.1462	6.9707
									[0.3044]	[0.6266]	[0.7443]	[1.0368]
INST	0.6624	1.5588**	0.8570	24.5860	0.2531	1.1044**	0.5154	22.5573	0.5905	1.6425***	1.1191*	38.0863*
	[0.6039]	[2.3377]	[1.3178]	[1.0270]	[0.3304]	[2.2290]	[1.0541]	[1.1784]	[0.7659]	[2.9544]	[1.8993]	[1.7542]
MTB	-1.4353**	-1.3003**	-0.7405	-35.5858**	-0.8560	-0.6321	-0.1512	-21.7597	-1.0124	-0.8686	-0.3848	-27.3464
	[-2.0765]	[-2.0949]	[-0.9899]	[-2.0809]	[-1.2059]	[-1.3191]	[-0.3159]	[-1.0328]	[-1.5574]	[-1.5879]	[-0.7119]	[-1.3507]
ROA	11.4679*	8.8625**	11.0564***	445.8136***	4.2253	3.9592*	4.9865**	179.8085	2.8909	2.3981	2.8844	128.1718
	[1.8933]	[2.1846]	[2.6422]	[3.3563]	[0.9921]	[1.6576]	[2.0427]	[1.4388]	[0.6597]	[0.9468]	[1.2788]	[0.9499]
Size	-0.0450	-0.2102	-0.3851	-4.3444	-0.3057*	-0.5578***	-0.6905***	-12.3204**	-0.1858	-0.3619**	-0.4427**	-7.5456
	[-0.1640]	[-0.6625]	[-1.0315]	[-0.8014]	[-1.7436]	[-3.3020]	[-3.6732]	[-2.5598]	[-1.3353]	[-2.3386]	[-2.4705]	[-1.5077]
AC	-0.0203	-0.0078	0.0220	0.2327	0.0191	0.0448**	0.0646***	1.0241	0.0122	0.0324*	0.0472**	0.7649
	[-0.7690]	[-0.3075]	[0.5781]	[0.3885]	[0.7418]	[2.4157]	[2.8379]	[1.6416]	[0.5495]	[1.7929]	[2.2035]	[1.2582]
BDIND	-1.4989***	-0.9058***	-0.7953*	-37.8121***	-1.1429***	-0.7602***	-0.6302**	-26.1464**	-1.0679**	-0.7265**	-0.5876*	-28.3268**
	[-2.6239]	[-4.0141]	[-1.7742]	[-4.2520]	[-2.8309]	[-2.9239]	[-2.0387]	[-2.3749]	[-2.5016]	[-2.5358]	[-1.6821]	[-2.4111]
BDSIZE	-0.0772	-0.1778**	-0.1191	-2.6221	-0.1063	-0.0862	-0.0130	-2.5958	-0.1251	-0.1204	-0.0536	-3.6606
	[-0.7267]	[-2.5728]	[-1.1765]	[-0.9227]	[-1.2795]	[-1.1180]	[-0.1385]	[-1.0797]	[-1.4155]	[-1.4352]	[-0.5903]	[-1.2962]
DISP	-120.0986***	-108.6424**	-100.2889**	-3209.0707***	-28.9714	3.5792	15.0541	-550.1845	-18.9922	15.9963	25.5926	-236.4470
	[-3.0055]	[-2.5087]	[-2.2641]	[-3.6691]	[-1.0310]	[0.1382]	[0.6171]	[-0.5885]	[-0.6222]	[0.5635]	[0.9291]	[-0.2267]
RVOL	95.2538***	72.0093***	81.6423***	2566.1554***	7.9503	-11.3031	-7.6233	303.9505	17.0145	1.3254	6.6806	766.1504
	[3.5740]	[3.6014]	[2.8828]	[4.0474]	[0.3575]	[-0.7145]	[-0.5888]	[0.4222]	[0.8055]	[0.0822]	[0.5101]	[1.0508]
Mill's Ratio	-3.7473*	-4.9692***	-5.2584**	-65.8522	-1.6128	-2.7799*	-2.8469*	-27.9783	-0.9829	-2.0038	-1.9039	-11.3297
	[-1.8147]	[-3.4845]	[-2.0975]	[-1.5122]	[-1.6253]	[-1.8731]	[-1.7324]	[-0.6036]	[-0.8929]	[-1.2718]	[-1.0582]	[-0.2293]
N	165	165	165	165	262	262	262	262	262	262	262	262
pseudo R^2	0.1688	0.2771		0.0984	0.0983	0.1684		0.0399	0.0738	0.1082		0.0246

Table 7: E-Index and Institutional Regressions

This table contains the results of regression specifications when the sample is split into two samples by the median *E-Index* values. All results presented are reflective of the second stage of the Heckman (1979) two-step selection model. The other regressions are not provided for brevity, but are available upon request. Column 1 is a logit regression specification with the *DISC-Binary* measure as the dependent variable. Column 2 is the Poisson regression specification with the *DISC-Count* variable as the dependent variable. Column 3 exhibits the GLM fractional logit regression specification appropriate for the *DISC-Ratio* variable as the dependent variable. Column 4 reports the Tobit regression specification with a lower limit of 0 for the dependent variable of *DISC-Transparency*. *E-Index* is the governance index from Bebchuk, Cohen, and Ferrell (2009). Control variables include: *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, *DISP* is the analyst forecast dispersion for the respective firms, *MTB* is the market-to-book ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, and *Size* is the size of the firm. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

	Low E-Index Sample Second Stage Heckman Regressions				High E-Index Sample Second Stage Heckman Regressions			
	(1) Logit DISC-Binary	(2) Poisson DISC-Count	(3) Fractional DISC-Ratio	(4) Tobit LL(0) DISC-Transparency	(5) Logit DISC-Binary	(6) Poisson DISC-Count	(7) Fractional DISC-Ratio	(8) Tobit LL(0) DISC-Transparency
INST	-0.7453	-0.5114	-0.6581	-18.5739**	0.5339	1.5087***	1.2190**	1193.4199*
	[-0.4350]	[-0.3116]	[-0.3942]	[-2.6551]	[0.7813]	[3.0005]	[2.1747]	[1.7849]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
N	63	63	63	63	199	199	199	199
pseudo R^2	0.3427	0.2533		0.3594	0.1174	0.1411		0.0222

Table 8: Delta E-Index Regressions

This table contains the results of change regression specifications. The dependent variables are the change in the respective index between years. *G-Index* is the governance index from Gompers, Ishii, and Metrick (2003). *E-Index* is the governance index from Bebchuk, Cohen, and Ferrell (2009). *ATI* is the alternative takeover provision index from Cremers and Cohen (2005). *MTB* is the market-to-book ratio, *ROA* is the firm's return on assets, and *Size* is the size of the firm. *HEDGER-Binary* is an indicator variable that the firm has a hedge ratio for the particular year. All results presented are reflective of the OLS regression specifications with clustered standard errors and firm and year dummies. T-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

	(1) All ΔG-Index	(2) Only Hedgers ΔG-Index	(3) All ΔE-Index	(4) Only Hedgers ΔE-Index	(5) All ΔATI	(6) Only Hedgers ΔATI
DISC-Initial	-0.1765	-0.1237	0.0939	0.1923	-0.0322	0.0283
	[-1.1488]	[-0.7145]	[0.4660]	[0.9741]	[-0.2829]	[0.1821]
ΔMTB	0.0915	0.3239	-0.0978	-0.0416	-0.2207	-0.4745***
	[0.3488]	[1.3077]	[-0.4730]	[-0.1539]	[-1.5679]	[-2.8495]
ΔROA	0.6314	0.5188	-0.8863	-0.5407	-0.6155	-0.7768
	[0.8896]	[0.5128]	[-1.3690]	[-0.7232]	[-1.4089]	[-1.4312]
ΔSize	0.0762	0.1931	0.0537	0.0536	0.1929	0.3129*
	[0.3366]	[0.7661]	[0.2218]	[0.1615]	[1.3687]	[1.7397]
N	226	149	376	264	376	264
adj. R^2	0.1853	0.1147	0.5376	0.5369	0.0192	0.0972

Table 9: Second-Stage Heckman E-Index Provision Regressions

This table contains the results of regression specifications conducted to analyze the relation between the specific provisions of the *E-Index* (staggered board, limits to amend bylaws, limits to amend charter, supermajority, golden parachutes, and poison pill) and various measures of voluntary disclosures made by oil and gas mining firms (SIC Code = 1311) between January 1991 and January 2013. All results presented are reflective of the second stage of the Heckman (1979) two-step selection model. The other regressions are not provided for brevity, but are available upon request. Column 1 is a logit regression specification with the *DISC-Binary* measure as the dependent variable. Column 3 is the Poisson regression specification with the *DISC-Count* variable as the dependent variable. Column 5 exhibits the GLM fractional logit regression specification appropriate for the *DISC-Ratio* variable as the dependent variable. Column 7 reports the Tobit regression specification with a lower limit of 0 for the dependent variable of *DISC-Transparency*. Control variables include: *AC* is the measure of the level of analyst coverage, *BDIND* is a measure of board independence, *BDSIZE* is a measure of the board size, *DISP* is the analyst forecast dispersion for the respective firms, *MTB* is the market-to-book ratio, *ROA* is the firm's return on assets, *RVOL* is the firm's stock return volatility, and *Size* is the size of the firm. The standard errors are clustered and the t-statistics are presented in brackets below the respective coefficients. The symbols *, **, and *** denote statistical significance at the 0.10, 0.05 and 0.01 levels, respectively, using a 2-tailed test. The variables in the table are defined in Appendix A.

	(1) Logit DISC-Binary	(2) Marginal Effects	(3) Poisson DISC-Count	(4) Marginal Effects	(5) Fractional DISC-Ratio	(6) Marginal Effects	(7) Tobit LL(0) DISC-Transparency
Staggered boards	-0.0289	-0.0045	0.0149	0.0104	0.2483	0.0048	11.7193
	[-0.0584]		[0.0370]		[0.7455]		[0.8754]
Limits to amend Bylaws	1.1895***	0.1850	1.3076***	0.9153	1.1515***	0.0223	24.6124**
	[3.4681]		[6.6487]		[3.7239]		[2.1518]
Limits to amend Charter	-1.1966*	-0.1861	-0.4498	-0.3149	-0.3224	-0.0062	-17.6784
	[-1.7766]		[-1.0682]		[-0.7764]		[-1.2789]
Supermajority	0.5131*	0.0798	1.0375***	0.7262	0.9464***	0.0183	32.8505***
	[1.8112]		[4.3525]		[2.9410]		[4.2788]
Golden Parachutes	1.1000	0.1711	0.8907***	0.6235	0.8429**	0.0163	30.7283**
	[1.5583]		[2.7215]		[2.4925]		[2.2418]
Poison pill	0.9476	0.1474	0.5612	0.3928	0.5939	0.0115	15.0923
	[1.6440]		[1.3256]		[1.5169]		[1.3278]
Controls	YES		YES		YES		YES
N	290		290		290		290
pseudo R^2	0.1320		0.1916				0.0609

Table 10: Descriptive Statistics, Chapter 2

Descriptive statistics for all of the variables included in the analysis throughout the article using the dividend initiation data for all other firms located in an MSA as the announcement. The time period for the sample is 1980 to 2011 and results in a total of 748 dividend initiations after the data screens. The variables in the table are defined in Appendix B.

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
AGE	28,245	25.698	14.981	0	13	24	37	62
CAR	28,245	0.003	0.074	-0.201	-0.037	-0.001	0.038	0.267
Cash/TA	28,245	0.119	0.148	0.000	0.019	0.059	0.160	0.721
EBITDA/TA	28,245	0.037	0.028	-0.050	0.021	0.036	0.051	0.130
High Institutional	28,245	0.405	0.323	0.000	0.089	0.379	0.676	1.000
Institutional Holdings	28,245	0.250	0.433	0	0	0	0	1
Log (# of Dividend Firms)	28,245	3.252	0.737	1.386	2.708	3.296	3.932	4.357
Log (# of Firms)	28,245	3.880	0.685	2.398	3.367	3.912	4.554	4.820
Log (Population)	28,245	16.351	0.732	14.634	15.776	16.620	17.080	17.210
Low Institutional	28,245	0.750	0.433	0	1	1	1	1
Payer	28,245	0.546	0.498	0	0	1	1	1
Sales	28,245	4.830	1.894	0.780	3.444	4.709	6.177	9.485
Senior	28,245	0.117	0.015	0.077	0.109	0.124	0.128	0.141
Senior Citizen	28,245	0.250	0.433	0	0	0	0	1
Size	28,245	6.072	1.993	2.542	4.560	5.868	7.459	11.123
State Unemployment Rate	28,245	0.063	0.017	0.032	0.050	0.061	0.074	0.117
Stock Return	28,245	0.033	0.200	-0.519	-0.080	0.031	0.140	0.687
Tobin's Q	28,245	1.637	0.933	0.672	1.059	1.342	1.850	6.026
Top 20 City	28,245	0.343	0.475	0	0	0	1	1
Total Debt/TA	28,245	0.237	0.187	0.000	0.082	0.217	0.348	0.831

Table 11: Univariate Statistics by Senior Citizen Population Quartiles

Descriptive statistics for all of the variables included in the analysis throughout the article using the dividend initiation data for all other firms located in an MSA as the announcement. The time period for the sample is 1980 to 2011 and results in a total of 748 dividend initiations after the data screens. The variables in the table are defined in Appendix B.

Panel A

	Senior Citizen Population Quartiles				
	1	2	3	4	1-4
Whole Sample	0.0024	0.0013	0.0045	0.0048	-0.0024*
Dividend Payers	-0.0004	0.0001	0.0029	0.0024	-0.0028**
Non-Dividend payers	0.0061	0.0023	0.0065	0.0078	-0.0017

Panel B

	Senior Citizen Population Quartiles				
State Unemployment Rate	1	2	3	4	1-4
1 (Lowest)	-0.0069	0.0020	0.0029	0.0046	-0.0115***
2	0.0057	0.0033	0.0040	0.0042	0.0015
3	0.0020	0.0037	0.0000	0.0058	-0.0038
4	0.0025	0.0024	0.0088	0.0061	-0.0037

Panel C

	Senior Citizen Population Quartiles				
	1	2	3	4	1-4
Outside Top 20 City	0.0041	0.0014	0.0048	0.0054	-0.0013
Top 20 City	-0.0004	0.0002	0.0044	0.0035	-0.0039*

Table 11 (*continued*)

Panel D

	Senior Citizen Population Quartiles				
Size Quartiles	1	2	3	4	1-4
1 (Lowest)	0.0045	0.0067	0.0054	0.0103	-0.0058*
2	0.0031	0.0038	0.0060	0.0034	-0.0003
3	0.0016	0.0014	0.0026	0.0044	-0.0028
4	-0.0014	-0.0041	0.0030	0.0017	-0.0031

Panel E

	Senior Citizen Population Quartiles				
Tobin's Q	1	2	3	4	1-4
1 (Lowest)	0.0060	0.0063	0.0103	0.0133	-0.0073**
2	0.0019	0.0007	0.0058	0.0029	-0.0010
3	0.0007	0.0020	0.0002	0.0024	-0.0017
4	0.0010	-0.0034	0.0032	-0.0007	0.0017

Table 12: Fixed Effects Regression Analysis for the Total Sample

This table provides the regression analysis of the data with the dependent variable being *CAR*. These regressions are representative of the time period from 1980 to 2011. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 12 (*continued*)

	Whole Sample				Dividend Paying Sample				Non-Dividend Paying Sample			
	(1)	(2)	(3)	(4)	**(5)**	**(6)**	**(7)**	**(8)**	(9)	(10)	(11)	(12)
Senior Citizen	0.004**	0.004**	0.004**	0.003*	**0.003*****	**0.003*****	**0.003****	**0.003***	0.004	0.003	0.004	0.003
	(0.032)	(0.038)	(0.043)	(0.099)	**(0.008)**	**(0.005)**	**(0.017)**	**(0.052)**	(0.177)	(0.298)	(0.212)	(0.550)
State Rate	0.010	0.063	0.014	-0.014	**-0.010**	**0.029**	**-0.010**	**-0.051**	0.005	0.075	-0.002	0.059
	(0.765)	(0.145)	(0.637)	(0.779)	**(0.785)**	**(0.378)**	**(0.753)**	**(0.412)**	(0.930)	(0.320)	(0.979)	(0.560)
Cash/TA	0.003	0.002	0.001	0.006	**0.004**	**0.003**	**0.004**	**0.008**	0.001	-0.000	-0.001	0.004
	(0.578)	(0.713)	(0.842)	(0.557)	**(0.228)**	**(0.309)**	**(0.313)**	**(0.165)**	(0.887)	(0.989)	(0.942)	(0.811)
Ebitda/TA	0.106**	0.107**	0.103**	0.144**	**0.124*****	**0.127*****	**0.124*****	**0.157*****	0.106*	0.103*	0.097	0.146*
	(0.011)	(0.011)	(0.016)	(0.018)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.078)	(0.083)	(0.129)	(0.098)
Log(# of firms)	0.001	0.003	0.001	0.003	**0.001**	**0.002**	**0.000**	**0.001**	0.002	0.004	0.002	0.006
	(0.522)	(0.289)	(0.413)	(0.358)	**(0.739)**	**(0.607)**	**(0.845)**	**(0.736)**	(0.394)	(0.156)	(0.238)	(0.121)
Log (pop.)	0.001	0.004	0.001	-0.004	**0.002**	**-0.000**	**0.002**	**-0.006**	0.000	0.008	-0.001	-0.011
	(0.329)	(0.582)	(0.636)	(0.611)	**(0.147)**	**(0.971)**	**(0.179)**	**(0.289)**	(0.851)	(0.503)	(0.568)	(0.587)
Sales	-0.001***	-0.001***	-0.001***	-0.005***	**-0.001**	**-0.001**	**-0.000**	**-0.005*****	-0.001**	-0.001**	-0.001**	-0.004**
	(0.000)	(0.000)	(0.000)	(0.001)	**(0.220)**	**(0.159)**	**(0.511)**	**(0.004)**	(0.037)	(0.046)	(0.030)	(0.011)
Stock Return	-0.004**	-0.004*	-0.004*	-0.005	**-0.008*****	**-0.009*****	**-0.008*****	**-0.011*****	-0.002	-0.002	-0.002	-0.002
	(0.032)	(0.064)	(0.055)	(0.151)	**(0.002)**	**(0.003)**	**(0.001)**	**(0.000)**	(0.487)	(0.646)	(0.501)	(0.646)
Tobin's Q	-0.004***	-0.004***	-0.004***	-0.007***	**-0.005*****	**-0.005*****	**-0.005*****	**-0.008*****	-0.003**	-0.003**	-0.003**	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.021)	(0.021)	(0.032)	(0.007)
Top 20 City	-0.001	-0.001	-0.002	-0.082***	**-0.002***	**-0.001**	**-0.002**	**-0.187*****	-0.001	-0.000	-0.001	0.068***
	(0.221)	(0.399)	(0.128)	(0.000)	**(0.086)**	**(0.139)**	**(0.103)**	**(0.000)**	(0.402)	(0.786)	(0.427)	(0.000)
Debt/TA	0.000	-0.000	0.000	0.004	**-0.003**	**-0.004**	**-0.002**	**0.001**	0.000	-0.001	0.001	0.006
	(0.940)	(0.802)	(0.920)	(0.304)	**(0.457)**	**(0.423)**	**(0.539)**	**(0.649)**	(0.930)	(0.846)	(0.726)	(0.327)
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	28,245	28,245	28,245	28,245	**15,414**	**15,414**	**15,414**	**15,414**	12,831	12,831	12,831	12,831
r^2	0.011	0.013	0.014	0.082	**0.015**	**0.016**	**0.02**	**0.138**	0.013	0.017	0.018	0.106

Table 13: Fixed Effects Regression Analysis for the Total Sample Incorporating Hoberg-Phillips TNIC Screens

This table provides the regression analysis of the data with the dependent variable being *CAR*. These regressions are representative of the time period from 1996 to 2008 and exclude firm observations classified in the same two-digit SIC code industry and the relatedness measure from Hoberg and Phillips known as the Text-based Network Industry Classifications. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 13 (*continued*)

	Whole Sample (1)	(2)	(3)	(4)	**Dividend Payers (5)**	**(6)**	**(7)**	**(8)**	Non-Dividend Payers (9)	(10)	(11)	(12)
Senior Citizen	0.007**	0.009*	0.008**	0.006	**0.009*****	**0.010****	**0.010*****	**0.010**	0.006	0.007	0.006	0.002
	(0.047)	(0.071)	(0.039)	(0.293)	**(0.002)**	**(0.032)**	**(0.001)**	**(0.117)**	(0.274)	(0.217)	(0.223)	(0.812)
State Rate	0.521***	0.607***	0.494**	0.723**	**0.435***	**0.564*****	**0.442***	**0.712****	0.548**	0.609**	0.505*	0.832
	(0.007)	(0.003)	(0.027)	(0.046)	**(0.051)**	**(0.009)**	**(0.056)**	**(0.029)**	(0.025)	(0.011)	(0.073)	(0.151)
Cash/TA	0.003	0.002	0.002	0.009	**0.010**	**0.009**	**0.006**	**0.021****	-0.003	-0.002	0.001	0.007
	(0.627)	(0.721)	(0.725)	(0.462)	**(0.166)**	**(0.252)**	**(0.471)**	**(0.048)**	(0.745)	(0.829)	(0.930)	(0.586)
Ebitda/TA	0.080	0.083	0.080	0.112	**0.144*****	**0.149*****	**0.131*****	**0.252*****	0.057	0.056	0.047	0.081
	(0.138)	(0.123)	(0.152)	(0.327)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.499)	(0.498)	(0.628)	(0.640)
Log(# of firms)	-0.003	-0.005	-0.003	-0.006**	**0.001**	**0.000**	**0.000**	**-0.001**	-0.006	-0.008***	-0.006*	-0.009***
	(0.429)	(0.219)	(0.361)	(0.045)	**(0.818)**	**(0.990)**	**(0.921)**	**(0.930)**	(0.107)	(0.006)	(0.061)	(0.002)
Log (pop.)	0.006*	0.010	0.006**	0.043	**0.003**	**-0.007**	**0.003**	**0.062**	0.008**	0.014	0.007**	0.080
	(0.055)	(0.867)	(0.048)	(0.481)	**(0.377)**	**(0.889)**	**(0.283)**	**(0.193)**	(0.032)	(0.859)	(0.026)	(0.475)
Sales	-0.001***	-0.001***	-0.001**	-0.006	**-0.001**	**-0.001**	**-0.001**	**-0.007*****	-0.001*	-0.001*	-0.001	-0.009
	(0.001)	(0.002)	(0.014)	(0.188)	**(0.313)**	**(0.251)**	**(0.175)**	**(0.005)**	(0.088)	(0.100)	(0.276)	(0.228)
Stock Return	0.003	0.003	0.003	0.004	**-0.002**	**-0.004**	**-0.003**	**-0.001**	0.006	0.006	0.005	0.004
	(0.399)	(0.471)	(0.435)	(0.206)	**(0.466)**	**(0.293)**	**(0.248)**	**(0.825)**	(0.206)	(0.219)	(0.291)	(0.464)
Tobin's Q	-0.003**	-0.003**	-0.003**	-0.009***	**-0.004*****	**-0.004*****	**-0.004*****	**-0.011*****	-0.003	-0.002	-0.003	-0.008*
	(0.014)	(0.011)	(0.018)	(0.007)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.124)	(0.131)	(0.115)	(0.070)
Top 20 City	-0.001	-0.001	-0.001	-0.240***	**-0.001**	**-0.001**	**-0.000**	**-0.040*****	-0.001	0.000	-0.000	-0.117
	(0.468)	(0.636)	(0.768)	(0.000)	**(0.349)**	**(0.493)**	**(0.964)**	**(0.000)**	(0.702)	(0.926)	(0.950)	(0.681)
Debt/TA	-0.001	-0.001	0.001	-0.007	**-0.004**	**-0.005**	**-0.001**	**0.007**	0.001	0.001	0.003	-0.014
	(0.941)	(0.877)	(0.874)	(0.658)	**(0.714)**	**(0.665)**	**(0.908)**	**(0.658)**	(0.904)	(0.913)	(0.758)	(0.543)
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	10,668	10,668	10,668	10,668	**5,378**	**5,378**	**5,378**	**5,378**	5,290	5,290	5,290	5,290
r^2	0.014	0.019	0.021	0.136	**0.022**	**0.026**	**0.035**	**0.208**	0.013	0.022	0.024	0.162

Table 14: Mean Regression Analysis

This table provides the regression analysis of the data by announcement mean and MSA mean with the dependent variable being *CAR*. Below are the results for announcement mean regressions on the entire sample (Column 1), dividend paying firms in the sample (Column 2) and non-paying dividend firms within the sample (Column 3). As there were 748 total dividend initiation announcement identified, there is a maximum of 748 observations. Also, below are the results for the MSA mean regression for the entire sample (Column 4), dividend paying firms within the data (Column 5) and non-paying dividend firms within the sample (Column 6). As there were only observations from 26 MSAs after data screens there are only 26 observations for this analysis. These regressions are representative of the time period from 1980 to 2011. The reported standard errors for announcement mean regressions are clustered by MSA and the standard errors for the MSA mean regressions are adjusted to the specification consistent with White's robust standard errors. The constant term was included in the model but excluded from this table for brevity. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

	Whole Sample (1)	**Dividend Payers (2)**	**Non-Dividend Payers (3)**	Whole Sample (4)	Dividend Payers (5)	Non-Dividend Payers (6)
Senior Citizen	**0.002**	**0.004*** **	**0.002**	0.006	0.007***	0.002
	(0.228)	**(0.004)**	**(0.436)**	(0.427)	(0.010)	(0.771)
State Rate	**-0.072**	**0.001**	**-0.034**	-0.192	0.406*	-0.490
	(0.287)	**(0.985)**	**(0.766)**	(0.500)	(0.095)	(0.313)
Cash/TA	**0.012**	**-0.019**	**0.016**	0.014	-0.052	-0.261
	(0.760)	**(0.515)**	**(0.630)**	(0.893)	(0.450)	(0.132)
EBITDA/TA	**0.189**	**0.043**	**0.275***	-0.856	-0.068	0.466
	(0.108)	**(0.803)**	**(0.058)**	(0.286)	(0.827)	(0.425)
Log(# of Firms)	**0.003**	**0.001**	**0.002**	0.006	-0.000	0.021*
	(0.119)	**(0.365)**	**(0.381)**	(0.454)	(0.939)	(0.061)
Log(Population)	**-0.001**	**0.001**	**-0.001**	-0.000	0.001	-0.004
	(0.777)	**(0.449)**	**(0.697)**	(0.986)	(0.646)	(0.669)
Sales	**-0.002**	**-0.001**	**-0.002**	-0.002	0.007***	-0.009
	(0.234)	**(0.685)**	**(0.405)**	(0.634)	(0.005)	(0.190)
Stock Return	**-0.012***	**-0.015****	**-0.015**	0.078	0.078**	0.040
	(0.094)	**(0.042)**	**(0.233)**	(0.290)	(0.032)	(0.184)
Tobin's Q	**-0.010****	**0.003**	**-0.014*** **	0.026	0.010	0.062***
	(0.019)	**(0.535)**	**(0.004)**	(0.193)	(0.353)	(0.007)
Top 20 City	**-0.009****	**-0.009*** **	**-0.006**	-0.025*	-0.013***	-0.041**
	(0.013)	**(0.000)**	**(0.145)**	(0.069)	(0.009)	(0.016)
Total Debt/TA	**0.007**	**0.027**	**0.001**	0.135**	0.080**	0.042
	(0.848)	**(0.226)**	**(0.979)**	(0.021)	(0.017)	(0.538)
Year Fixed Effects	**Yes**	**Yes**	**Yes**	No	No	No
N	**748**	**748**	**746**	26	26	26
r^2	**0.127**	**0.112**	**0.098**	0.581	0.744	0.659

Table 15: Fixed Effects Regression Analysis for the Total Sample
Firms 10 Years or Older

This table provides the regression analysis of the data with the dependent variable being *CAR*. These regressions are representative of the time period from 1980 to 2011. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 15 (*continued*)

	Whole Sample				**Dividend Paying Sample**				Non-Dividend Paying Sample			
	(1)	(2)	(3)	(4)	**(5)**	**(6)**	**(7)**	**(8)**	(9)	(10)	(11)	(12)
Senior Citizen	0.003*	0.003*	0.003*	0.003	**0.003***	**0.004*****	**0.003***	**0.004****	0.003	0.001	0.003	-0.000
	(0.086)	(0.072)	(0.095)	(0.124)	**(0.058)**	**(0.007)**	**(0.075)**	**(0.018)**	(0.270)	(0.630)	(0.327)	(0.907)
State Rate	0.015	0.072*	0.025	0.004	**-0.021**	**0.021**	**-0.015**	**-0.067**	0.043	0.116	0.035	0.069
	(0.692)	(0.055)	(0.485)	(0.914)	**(0.630)**	**(0.553)**	**(0.695)**	**(0.242)**	(0.582)	(0.129)	(0.668)	(0.370)
Cash/TA	0.003	0.002	0.001	0.011	**0.004**	**0.003**	**0.004**	**0.005**	0.001	-0.000	0.001	0.014
	(0.623)	(0.777)	(0.786)	(0.308)	**(0.274)**	**(0.375)**	**(0.311)**	**(0.472)**	(0.897)	(0.975)	(0.929)	(0.442)
Ebitda/TA	0.108**	0.108**	0.104**	0.151**	**0.099*****	**0.102*****	**0.094*****	**0.166*****	0.128**	0.121**	0.117*	0.155*
	(0.014)	(0.014)	(0.013)	(0.015)	**(0.004)**	**(0.005)**	**(0.002)**	**(0.002)**	(0.044)	(0.047)	(0.062)	(0.087)
Log(# of firms)	0.002	0.004	0.002*	0.003	**0.001**	**0.004**	**0.001**	**0.004**	0.002	0.004	0.003	0.003
	(0.146)	(0.134)	(0.067)	(0.222)	**(0.356)**	**(0.167)**	**(0.462)**	**(0.234)**	(0.217)	(0.205)	(0.143)	(0.416)
Log (pop.)	0.001	0.003	0.001	-0.003	**0.002**	**0.002**	**0.002**	**-0.010**	0.000	0.002	-0.002	-0.006
	(0.283)	(0.703)	(0.642)	(0.769)	**(0.203)**	**(0.851)**	**(0.255)**	**(0.138)**	(0.880)	(0.869)	(0.428)	(0.758)
Sales	-0.001***	-0.001***	-0.001***	-0.003**	**-0.001**	**-0.001**	**-0.000**	**-0.006*****	-0.001**	-0.001**	-0.001**	-0.002
	(0.000)	(0.000)	(0.004)	(0.020)	**(0.317)**	**(0.253)**	**(0.646)**	**(0.001)**	(0.015)	(0.019)	(0.021)	(0.267)
Stock Return	-0.007***	-0.006**	-0.006***	-0.007**	**-0.007*****	**-0.008*****	**-0.007*****	**-0.010*****	-0.006**	-0.006**	-0.006**	-0.007**
	(0.007)	(0.011)	(0.008)	(0.015)	**(0.007)**	**(0.008)**	**(0.005)**	**(0.000)**	(0.015)	(0.022)	(0.019)	(0.031)
Tobin's Q	-0.004***	-0.004***	-0.005***	-0.008***	**-0.004*****	**-0.005*****	**-0.005*****	**-0.007*****	-0.004**	-0.004**	-0.004**	-0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.002)**	(0.015)	(0.013)	(0.022)	(0.007)
Top20City	-0.002	-0.001	-0.002*	-0.074***	**-0.002**	**-0.000**	**-0.002****	**-0.107*****	-0.002	-0.002	-0.002	-0.043**
	(0.116)	(0.120)	(0.071)	(0.000)	**(0.115)**	**(0.333)**	**(0.031)**	**(0.000)**	(0.167)	(0.150)	(0.233)	(0.025)
Debt/TA	0.000	-0.000	0.000	0.002	**-0.004**	**-0.004**	**-0.003**	**-0.002**	0.002	0.001	0.004	0.006
	(0.811)	(0.989)	(0.851)	(0.497)	**(0.259)**	**(0.234)**	**(0.409)**	**(0.639)**	(0.617)	(0.786)	(0.369)	(0.371)
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	23,619	23,619	23,619	23,619	**13,659**	**13,659**	**13,659**	**13,659**	9,960	9,960	9,960	9,960
r^2	0.012	0.013	0.015	0.085	**0.016**	**0.017**	**0.022**	**0.141**	0.014	0.016	0.019	0.108

Table 16: Fixed Effects Regression Analysis for the Total Sample
Institutional Ownership

This table provides the regression analysis of the data with the dependent variable being *CAR*. These regressions are representative of the time period from 1980 to 2011. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 16 (*continued*)

	Whole Sample				**Dividend Paying Sample**				Non-Dividend Paying Sample			
	(1)	(2)	(3)	(4)	**(5)**	**(6)**	**(7)**	**(8)**	(9)	(10)	(11)	(12)
State Rate	0.009	0.063	0.013	-0.013	**-0.009**	**0.029**	**-0.009**	**-0.050**	0.006	0.075	-0.001	0.058
	(0.771)	(0.147)	(0.641)	(0.778)	**(0.804)**	**(0.368)**	**(0.775)**	**(0.416)**	(0.926)	(0.324)	(0.981)	(0.569)
Cash/TA	0.003	0.002	0.001	0.006	**0.004**	**0.003**	**0.003**	**0.008**	0.001	-0.000	-0.001	0.004
	(0.592)	(0.725)	(0.858)	(0.534)	**(0.238)**	**(0.324)**	**(0.320)**	**(0.165)**	(0.887)	(0.994)	(0.941)	(0.794)
Ebitda/TA	0.106**	0.107**	0.103**	0.144**	**0.124*** **	**0.127*** **	**0.124*** **	**0.157*** **	0.107*	0.103*	0.097	0.146
	(0.010)	(0.010)	(0.015)	(0.019)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.074)	(0.079)	(0.127)	(0.102)
Log(# of firms)	0.001	0.003	0.001	0.003	**0.000**	**0.001**	**0.000**	**0.001**	0.001	0.004	0.002	0.006
	(0.537)	(0.288)	(0.431)	(0.361)	**(0.757)**	**(0.617)**	**(0.873)**	**(0.738)**	(0.411)	(0.153)	(0.253)	(0.120)
Log (pop.)	0.001	0.004	0.001	-0.004	**0.002**	**-0.001**	**0.002**	**-0.006**	0.000	0.008	-0.001	-0.011
	(0.326)	(0.599)	(0.634)	(0.617)	**(0.140)**	**(0.938)**	**(0.176)**	**(0.297)**	(0.883)	(0.517)	(0.546)	(0.584)
Sales	-0.001***	-0.001***	-0.001***	-0.005***	**-0.001**	**-0.001**	**-0.000**	**-0.005*** **	-0.001	-0.001	-0.001	-0.004**
	(0.000)	(0.000)	(0.000)	(0.001)	**(0.214)**	**(0.157)**	**(0.502)**	**(0.004)**	(0.125)	(0.140)	(0.105)	(0.024)
Stock Return	-0.004**	-0.004*	-0.004*	-0.005	**-0.008*** **	**-0.009*** **	**-0.008*** **	**-0.011*** **	-0.002	-0.002	-0.003	-0.002
	(0.032)	(0.064)	(0.055)	(0.147)	**(0.002)**	**(0.003)**	**(0.001)**	**(0.000)**	(0.472)	(0.630)	(0.495)	(0.638)
Tobin's Q	-0.004***	-0.004***	-0.004***	-0.007***	**-0.005*** **	**-0.005*** **	**-0.005*** **	**-0.008*** **	-0.003**	-0.003**	-0.003**	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.028)	(0.029)	(0.036)	(0.008)
Top20City	-0.001	-0.001	-0.002	-0.082***	**-0.002***	**-0.001**	**-0.002***	**-0.187*** **	-0.001	-0.000	-0.001	0.068***
	(0.217)	(0.395)	(0.129)	(0.000)	**(0.075)**	**(0.115)**	**(0.092)**	**(0.000)**	(0.406)	(0.789)	(0.427)	(0.000)
Debt/TA	0.000	-0.001	0.000	0.004	**-0.003**	**-0.004**	**-0.002**	**0.001**	0.000	-0.001	0.001	0.006
	(0.974)	(0.772)	(0.933)	(0.304)	**(0.455)**	**(0.420)**	**(0.535)**	**(0.639)**	(0.956)	(0.824)	(0.732)	(0.340)
High Institutional	-0.000	-0.000	-0.000	-0.002	**0.001**	**0.001**	**0.001**	**-0.000**	-0.002	-0.002	-0.001	-0.003**
	(0.765)	(0.736)	(0.954)	(0.216)	**(0.390)**	**(0.404)**	**(0.349)**	**(0.862)**	(0.323)	(0.288)	(0.564)	(0.044)
High Institutional Senior Citizen*	0.001	0.002	0.001	0.002	**0.001**	**0.001**	**0.000**	**0.003**	0.002	0.002	0.002	0.003
	(0.604)	(0.563)	(0.615)	(0.530)	**(0.732)**	**(0.521)**	**(0.862)**	**(0.221)**	(0.693)	(0.733)	(0.669)	(0.613)
Low Institutional Senior Citizen*	0.005***	0.004***	0.004**	0.004**	**0.004*** **	**0.004*** **	**0.004*** **	**0.003*** *	0.005	0.004	0.004	0.002
	(0.009)	(0.010)	(0.014)	(0.049)	**(0.001)**	**(0.001)**	**(0.002)**	**(0.043)**	(0.118)	(0.220)	(0.159)	(0.570)
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	28,245	28,245	28,245	28,245	**15,414**	**15,414**	**15,414**	**15,414**	12,831	12,831	12,831	12,831
r^2	0.011	0.013	0.014	0.082	**0.015**	**0.016**	**0.02**	**0.138**	0.013	0.017	0.018	0.106

Table 17: Fixed Effects Regression Analysis
Dividend Paying Sample Outside the Announcing MSA

This table provides the regression analysis of the data with the dependent variable being *CAR*. Regressions in columns 1 through 4 are illustrative of the sample of seemingly unrelated firms (different 2-digit SIC code) outside the MSA of the initiating firm during the dividend announcement. The regressions in columns 5 through 8 are representative of industry related firm observations (same 2-digit SIC code) outside the MSA of the initiating firm during the dividend announcement. The sample period for the data is from 1980 to 2011. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 17 (*continued*)

	Different 2-Digit SIC Code Sample				Same 2-Digit SIC Code Sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Senior Citizen	0.001**	0.001	0.001	0.001	0.001	-0.002	0.001	-0.005*
	(0.037)	(0.546)	(0.105)	(0.574)	(0.777)	(0.516)	(0.703)	(0.093)
State Rate	0.031*	0.038	0.030*	0.024	0.019	0.061	0.032	0.073
	(0.076)	(0.125)	(0.088)	(0.434)	(0.698)	(0.449)	(0.517)	(0.450)
Cash/TA	0.004**	0.004*	0.004**	0.000	0.006	0.004	0.006	0.005
	(0.036)	(0.055)	(0.043)	(0.885)	(0.264)	(0.518)	(0.311)	(0.624)
Ebitda/TA	0.105***	0.105***	0.111***	0.143***	0.150***	0.153***	0.145***	0.142***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)
Log(# of firms)	0.002**	0.004***	0.002***	0.004***	-0.000	-0.001	0.003	0.002
	(0.013)	(0.001)	(0.005)	(0.000)	(0.719)	(0.598)	(0.167)	(0.496)
Log (pop.)	-0.002**	0.001	-0.002***	-0.001	0.001*	0.003	0.001*	0.001
	(0.010)	(0.815)	(0.004)	(0.722)	(0.083)	(0.416)	(0.075)	(0.878)
Sales	-0.000***	-0.000***	-0.001***	-0.005***	-0.001	-0.001*	-0.001*	-0.001
	(0.001)	(0.000)	(0.000)	(0.000)	(0.141)	(0.088)	(0.095)	(0.502)
Stock Return	-0.002	-0.002	-0.002	-0.003**	-0.010**	-0.010**	-0.009**	-0.011*
	(0.199)	(0.213)	(0.199)	(0.045)	(0.033)	(0.031)	(0.047)	(0.051)
Tobin's Q	-0.003***	-0.003***	-0.003***	-0.006***	-0.004***	-0.004***	-0.004***	-0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top 20 City	-0.000	-0.000	0.000	0.164***	-0.001	0.000	-0.001	0.024
	(0.642)	(0.953)	(0.990)	(0.000)	(0.661)	(0.955)	(0.323)	(0.173)
Debt/TA	-0.000	-0.000	0.000	-0.002	-0.008*	-0.010**	-0.010**	-0.006
	(0.907)	(0.878)	(0.996)	(0.413)	(0.058)	(0.040)	(0.032)	(0.528)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	No	Yes	No	No
SIC F.E.	No	No	Yes	No	No	No	Yes	No
Firm F.E.	No	No	No	Yes	No	No	No	Yes
N	168,878	168,878	168,878	168,878	9,333	9,333	9,333	9,333
r^2	0.010	0.010	0.011	0.037	0.019	0.041	0.028	0.230

Table 18: Fixed Effects Regression Analysis for the Total Sample Incorporating Dividend Payer Concentration within the MSA

This table provides the regression analysis of the data with the dependent variable being *CAR*. These regressions are representative of the time period from 1980 to 2011. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

Table 18 (*continued*)

	Whole Sample				**Dividend Paying Sample**				Non-Dividend Paying Sample			
	(1)	(2)	(3)	(4)	**(5)**	**(6)**	**(7)**	**(8)**	(9)	(10)	(11)	(12)
Senior Citizen	0.004**	0.004**	0.004**	0.003	**0.003*** **	**0.003*** **	**0.003** **	**0.003***	0.004	0.004	0.004	0.003
	(0.032)	(0.045)	(0.043)	(0.110)	**(0.008)**	**(0.006)**	**(0.019)**	**(0.056)**	(0.184)	(0.303)	(0.217)	(0.551)
State Rate	0.002	0.058	0.006	-0.019	**-0.017**	**0.022**	**-0.018**	**-0.058**	0.001	0.074	-0.005	0.056
	(0.957)	(0.181)	(0.824)	(0.697)	**(0.648)**	**(0.495)**	**(0.573)**	**(0.343)**	(0.984)	(0.342)	(0.938)	(0.584)
Cash/TA	0.003	0.002	0.001	0.006	**0.004**	**0.003**	**0.003**	**0.008**	0.001	-0.000	-0.001	0.004
	(0.582)	(0.709)	(0.845)	(0.554)	**(0.237)**	**(0.308)**	**(0.324)**	**(0.157)**	(0.885)	(0.994)	(0.946)	(0.809)
Ebitda/TA	0.106**	0.107**	0.103**	0.144**	**0.124*** **	**0.127*** **	**0.124*** **	**0.157*** **	0.107*	0.103*	0.097	0.147*
	(0.011)	(0.010)	(0.015)	(0.017)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.077)	(0.082)	(0.128)	(0.096)
Log(# of dividend firms)	-0.000	0.001	-0.000	0.001	**-0.001**	**-0.001**	**-0.001**	**-0.001**	0.001	0.003	0.001	0.003
	(0.757)	(0.731)	(0.866)	(0.809)	**(0.621)**	**(0.788)**	**(0.364)**	**(0.795)**	(0.743)	(0.363)	(0.566)	(0.320)
Log (pop.)	0.002*	0.005	0.002	-0.004	**0.003** **	**0.001**	**0.003** **	**-0.006**	0.001	0.008	-0.000	-0.010
	(0.052)	(0.511)	(0.174)	(0.658)	**(0.015)**	**(0.925)**	**(0.019)**	**(0.343)**	(0.561)	(0.493)	(0.922)	(0.607)
Sales	-0.001***	-0.001***	-0.001***	-0.005***	**-0.001**	**-0.001**	**-0.000**	**-0.005*** **	-0.001**	-0.001**	-0.001**	-0.004**
	(0.000)	(0.000)	(0.000)	(0.001)	**(0.232)**	**(0.173)**	**(0.541)**	**(0.004)**	(0.039)	(0.048)	(0.032)	(0.011)
Stock Return	-0.004**	-0.004*	-0.004*	-0.005	**-0.008*** **	**-0.008*** **	**-0.008*** **	**-0.011*** **	-0.002	-0.002	-0.003	-0.003
	(0.030)	(0.058)	(0.051)	(0.141)	**(0.003)**	**(0.003)**	**(0.001)**	**(0.000)**	(0.474)	(0.619)	(0.481)	(0.618)
Tobin's Q	-0.004***	-0.004***	-0.004***	-0.007***	**-0.005*** **	**-0.005*** **	**-0.005*** **	**-0.008*** **	-0.003**	-0.003**	-0.003**	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	(0.020)	(0.021)	(0.032)	(0.007)
Top20City	-0.001	-0.001	-0.001	-0.082***	**-0.002***	**-0.001**	**-0.002**	**0.117*** **	-0.001	-0.000	-0.001	0.068***
	(0.246)	(0.404)	(0.132)	(0.000)	**(0.077)**	**(0.131)**	**(0.104)**	**(0.000)**	(0.446)	(0.790)	(0.469)	(0.000)
Debt/TA	0.000	-0.000	0.000	0.003	**-0.003**	**-0.004**	**-0.002**	**0.002**	0.000	-0.001	0.001	0.006
	(0.934)	(0.795)	(0.910)	(0.313)	**(0.463)**	**(0.425)**	**(0.554)**	**(0.644)**	(0.930)	(0.837)	(0.730)	(0.335)
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	28,245	28,245	28,245	28,245	**15,414**	**15,414**	**15,414**	**15,414**	12,831	12,831	12,831	12,831
r^2	0.011	0.013	0.014	0.082	**0.015**	**0.016**	**0.02**	**0.138**	0.013	0.017	0.018	0.106

Table 19: Probit Regression Analysis including Fixed Effects
Dividend Paying Sub-Sample

This table provides the probit regression analysis of the dividend paying sample with the dependent variable being a binary variable that takes the value of 1 if the firm increased dividend payouts with the year following the dividend initiation. These regressions are representative of the time period from 1980 to 2011. The standard errors are clustered by MSA. P-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

	(1)	(2)	(3)	(4)
Senior Citizen	0.005	-0.016	-0.002	0.024
	(0.923)	(0.729)	(0.963)	(0.447)
State Unemployment Rate	-1.175	-0.522	-0.721	-1.543
	(0.614)	(0.726)	(0.693)	(0.134)
Cash/TA	0.157	0.211**	0.158	1.136***
	(0.154)	(0.016)	(0.209)	(0.000)
EBITDA/TA	8.241***	8.284***	8.774***	11.742***
	(0.000)	(0.000)	(0.000)	(0.000)
Log(# of Firms)	-0.040	-0.070	-0.065	-0.129*
	(0.466)	(0.303)	(0.120)	(0.057)
Log(Population)	0.055	0.342	0.042	0.055
	(0.387)	(0.108)	(0.355)	(0.628)
Sales	0.125***	0.126***	0.139***	0.154**
	(0.000)	(0.000)	(0.000)	(0.012)
Stock Return	0.104	0.097	0.137*	0.014
	(0.185)	(0.248)	(0.068)	(0.885)
Tobin's Q	0.104***	0.105***	0.062***	-0.095***
	(0.001)	(0.001)	(0.007)	(0.000)
Top 20 City	-0.089***	-0.083**	-0.009	-0.203
	(0.009)	(0.047)	(0.849)	(0.474)
Total Debt/TA	-0.571***	-0.548***	-0.574***	-0.952***
	(0.000)	(0.000)	(0.000)	(0.000)
constant	-2.322**	-6.807**	-1.701***	-1.082
	(0.012)	(0.044)	(0.010)	(0.521)
Year Fixed Effects	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	Yes	No	No
2-Digit SIC Fixed Effects	No	No	Yes	No
Firm Fixed Effects	No	No	No	Yes
N	15,414	15,414	15,405	12,831

Table 20: Change in ROA Fixed Effects Regression Analysis
Dividend Paying Sub-Sample

This table provides the regression analysis for the dividend paying sample where the dependent variable is the change in industry mean adjusted *EBITDA/TA* in the fiscal year of the dividend initiation from the industry mean adjusted *EBITDA/TA* of the previous year. These regressions are representative of the time period from 1980 to 2011. The standard errors are clustered by MSA. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

	(1)	(2)	(3)	(4)
Senior Citizen	-0.001	-0.001	-0.002	0.001
	(0.432)	(0.468)	(0.107)	(0.627)
State Unemployment Rate	0.116***	0.179***	0.120***	0.136*
	(0.005)	(0.000)	(0.002)	(0.090)
Cash/TA	0.005	0.005	0.004	0.006
	(0.418)	(0.382)	(0.515)	(0.407)
EBITDA/TA	0.144***	0.143***	0.147***	0.173***
	(0.004)	(0.005)	(0.004)	(0.001)
Log(# of Firms)	0.002*	0.002	0.002	0.001
	(0.073)	(0.393)	(0.225)	(0.742)
Log(Population)	-0.001	0.010	-0.001	0.011
	(0.514)	(0.138)	(0.463)	(0.191)
Sales	0.002***	0.001***	0.002***	-0.003
	(0.000)	(0.000)	(0.000)	(0.121)
Stock Return	0.034***	0.034***	0.035***	0.032***
	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.003***	-0.003***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.000)	(0.000)
Top 20 City	-0.001	-0.001	0.000	0.033***
	(0.499)	(0.560)	(0.958)	(0.000)
Total Debt/TA	0.009***	0.009***	0.010***	0.035***
	(0.002)	(0.003)	(0.000)	(0.000)
constant	-0.031*	-0.219**	0.016	-0.239*
	(0.053)	(0.029)	(0.414)	(0.099)
Year Fixed Effects	Yes	Yes	Yes	Yes
MSA Fixed Effects	No	Yes	No	No
2-Digit SIC Fixed Effects	No	No	Yes	No
Firm Fixed Effects	No	No	No	Yes
N	13,439	13,439	13,439	13,439
r^2	0.066	0.068	0.079	0.245

Table 21: Fixed Effects Regression Analysis across Multiple Event Windows Dividend Paying Sub-Sample

This table provides the regression analysis of the data with the dependent variable being represented by multiple event windows. These regressions are representative of the time period from 1980 to 2011 and the sub-sample of dividend paying firms. All models below include entire set of control variables used in the prior analyses. The robust standard errors are clustered by MSA. The constant terms are omitted for brevity. *P*-values are reported in the parentheses underneath the coefficient estimates. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. The variables in the table are defined in Appendix B.

	Market Adjusted CAR (-0, +0)				**Market Adjusted CAR (-1, +1)**				Market Adjusted CAR (-2, +2)			
	(1)	(2)	(3)	(4)	**(5)**	**(6)**	**(7)**	**(8)**	(9)	(10)	(11)	(12)
Senior Citizen	0.001*** (0.003)	0.001* (0.051)	0.001*** (0.004)	0.001* (0.053)	**0.002**** **(0.018)**	**0.002**** **(0.020)**	**0.002**** **(0.018)**	**0.003***** **(0.007)**	0.001* (0.077)	0.001 (0.300)	0.001 (0.200)	0.003** (0.029)
Control Variables	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes	**Yes**	**Yes**	**Yes**	**Yes**	Yes	Yes	Yes	Yes
MSA F.E.	No	Yes	No	No	**No**	**Yes**	**No**	**No**	No	Yes	No	No
SIC F.E.	No	No	Yes	No	**No**	**No**	**Yes**	**No**	No	No	Yes	No
Firm F.E.	No	No	No	Yes	**No**	**No**	**No**	**Yes**	No	No	No	Yes
N	15,409	15,409	15,409	15,409	**15,412**	**15,412**	**15,412**	**15,412**	15,414	15,414	15,414	15,414
r^2	0.008	0.01	0.011	0.126	**0.009**	**0.011**	**0.014**	**0.131**	0.012	0.015	0.018	0.134

Figure 2: Theoretical Bank Term Structures

This figure illustrates the contrasting shapes of the CSTS theorized by various authors dependent upon credit quality of the firm, underlying parameters, and economic conditions. Merton (1974) and Longstaff and Schwartz (1995) are two of the most cited theoretical papers and their qualitative results are partially reported below. Krishnan, Ritchken, and Thomson (2006) provide empirical analysis of bank credit spreads where, on average, they had a negative slope. We also provide a hypothetical positively-sloped insurance premium in a step function.

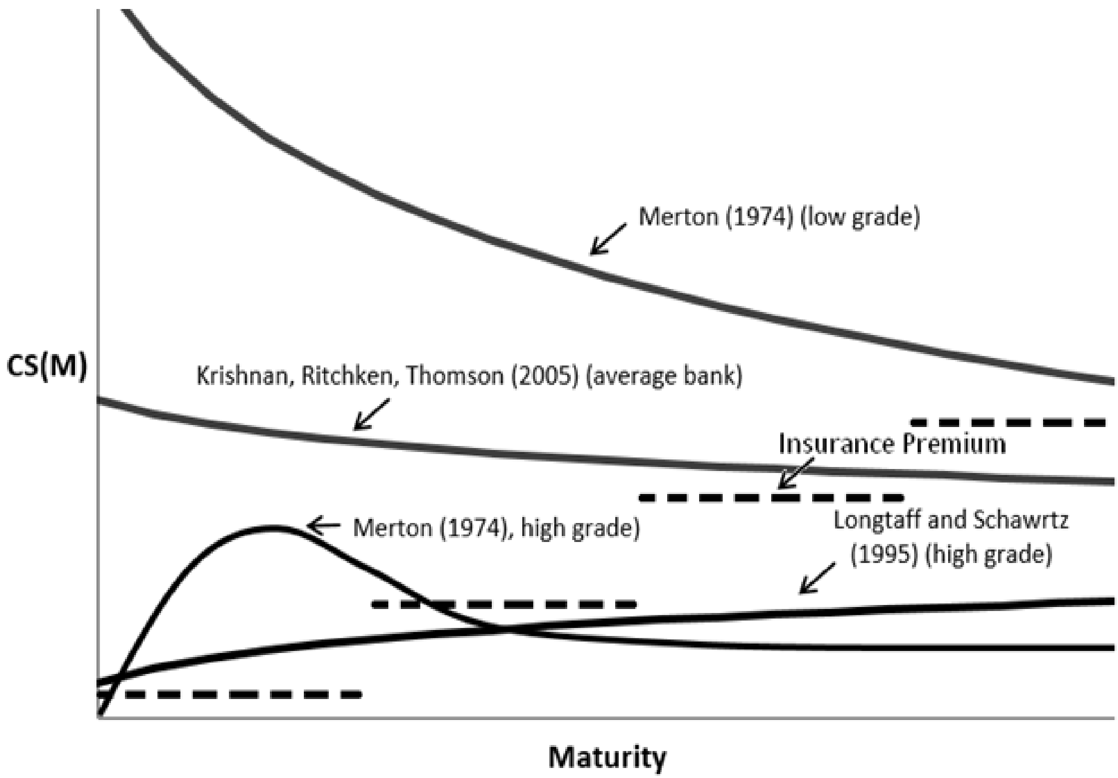


Figure 3: Credit Spread by Issuer Credit Rating

This figure displays the ratings fixed effects from the regression which emulates Model 3 from Table 25, replacing the constructed Rating and Junk variables with issuer credit rating fixed effects. The fixed effects are also interacted with the Guaranteed dummy variable. The values of the fixed effects are plotted with the solid line, while the fixed effects interacted with the guaranteed dummy are plotted with a dotted line. The remaining coefficients in the regression (untabulated) are qualitatively similar to those reported in Model 3 of Table 25.

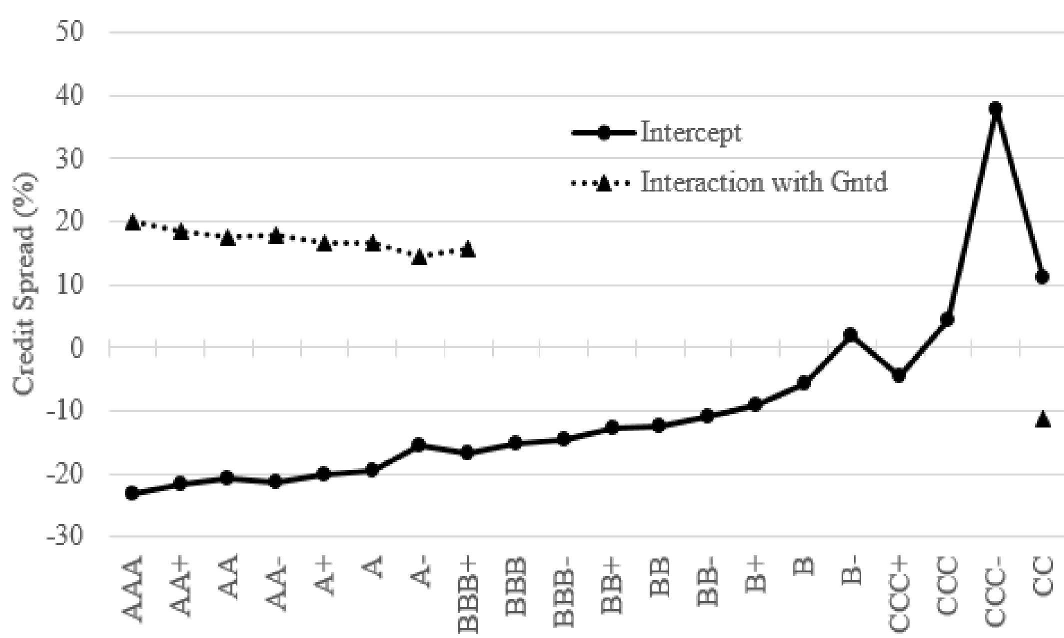


Figure 4: Maturity Impact on Credit Spread

These figures show the variation in credit spreads for the non-guaranteed and guaranteed bonds dependent upon maturity. Panel A is reflective of the full sample of bonds reported in Table 25 using Model 4 regression coefficients. The bond term structure modeled in Panel A is assumed to be investment grade. Panel B is reflective of the high credit rating sub-sample of bonds reported in Table 26 using Model 1. Panel C is reflective of the low credit rating sub-sample of bonds reported in Table 26 using Model 3. All bond estimates are reflective of the other variables taken at their mean for the appropriate sample and multiplied by the respective coefficients.

Panel A: Full Sample of Bonds – Table 25, Model 4

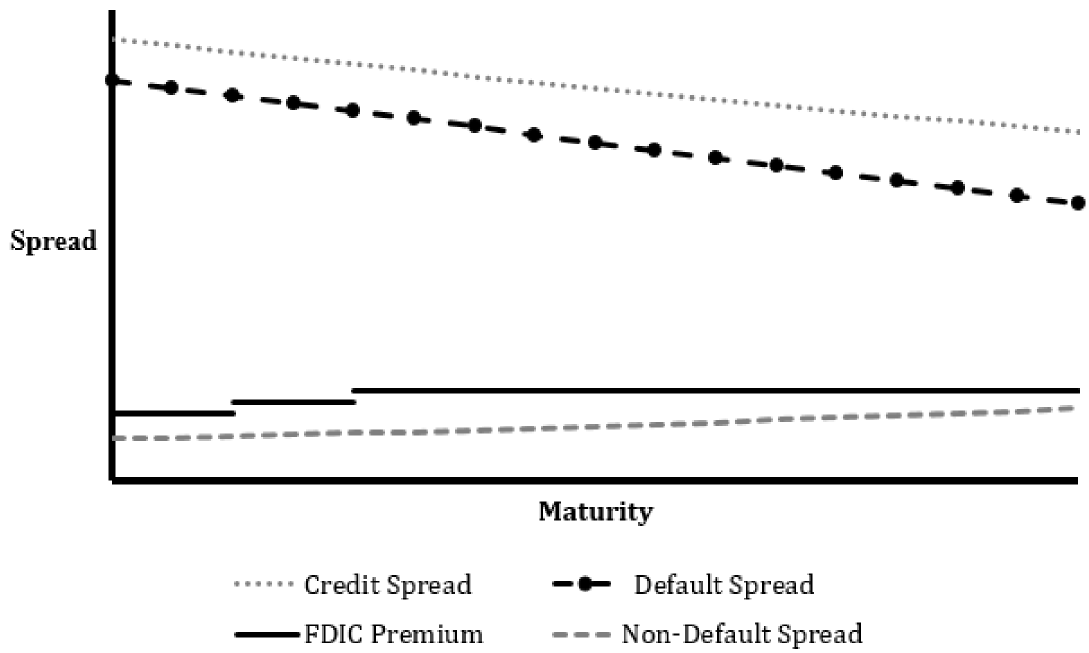
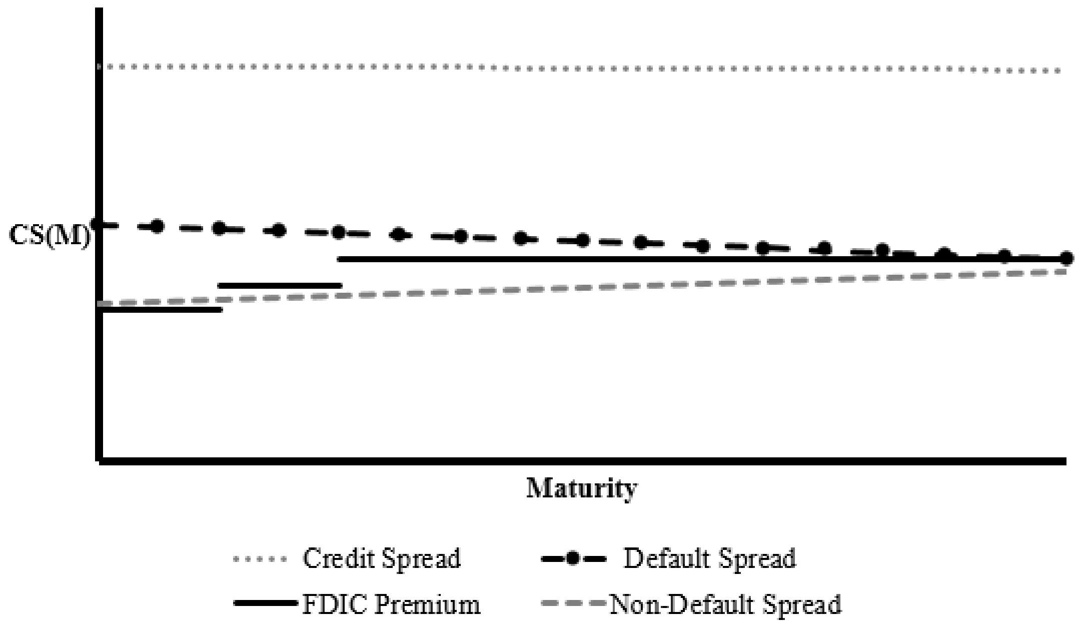


Figure 4 (*continued*)

Panel B: High Rating Sub-Sample of Bonds – Table 26, Model 1



Panel C: Low Rating Sub-Sample of Bonds – Table 26, Model 3

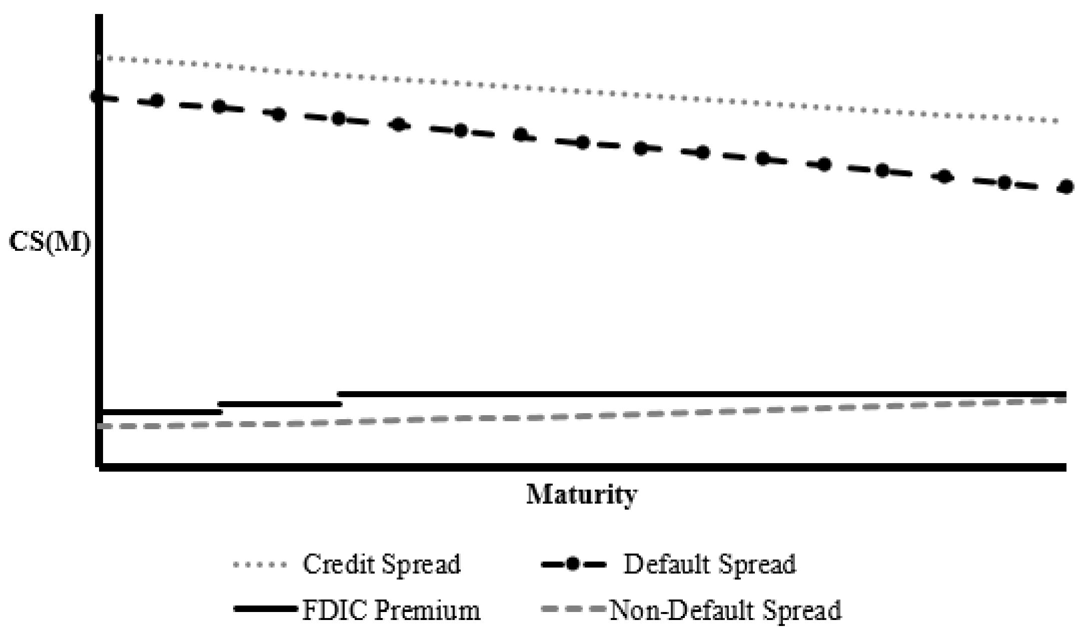


Table 22: FDIC Debt Guarantee Program Fees

This table provides the premiums charged by the FDIC for bonds issued under the Debt Guarantee Program. Panel A is representative of the fees charged based on the maturity of the issue. These rates increased by 10 basis points for senior unsecured debt issued by an entity that is not an insured depository institution if, as of September 30, 2008, the combined assets of all insured depository institutions affiliated with such entity constitute less than 50% of consolidated holding company assets. Panel B reports the additional premiums charged by the FDIC to those listed in Panel A for bonds issued under the Debt Guarantee Program after April 1, 2009.

Panel A: Fee Schedule A

For debt with a maturity of:	The annualized assessment rate (in basis points) is:
180 days or less (excluding overnight debt)	50
181 to 364 days	75
365 days or greater	100

Panel B: Fee Schedule B

Description	Insured Depository Institution (basis points)	Non-Insured Depository Institution (basis points)
Issued between April 1, 2009 and June 30, 2009 and Maturing by June 30, 2012	10	20
Issued on or after April 1, 2009 and maturing after June 30, 2012	25	50
Issued after June 30, 2009	25	50

Table 23: Descriptive Statistics, Chapter 3

This table provides descriptive statistics for Chapter 3 over the entire sample (Panel A) and guaranteed bonds only (Panel B). Observations are on a bond-day basis. All variables are defined in Appendix C.

Panel A - Full Sample

Variable	N	Mean	SD	Min	Med	Max
Rating	518,208	6.5708	3.9819	0	6	21
Coupon	517,821	5.8562	1.7925	0	5.9500	15.0000
Bond Age (Years)	518,208	3.9787	3.5423	0.0000	3.0767	72.4164
Leverage	517,582	0.3672	0.2066	0	0.3353	1.5661
Ln(Issue Size)	518,208	-1.0110	1.6428	-13.8155	-0.6931	1.9530
Ln(Firm Size)	518,208	11.2689	2.0024	5.1708	11.0026	15.0714
Ln(Bid-Ask Spread)	191,227	-4.6310	1.2370	-20.2333	-4.4341	-2.7914
Price	518,208	93.0628	21.1973	0	98.3291	1298.810
Maturity (Years)	518,208	8.9523	9.4299	0	5.6301	96.0685
Maturity^2	518,208	169.0661	423.7741	0	31.6984	9229.155
Baa-Aaa Spread	517,136	2.2371	0.8037	1.1100	2.4000	3.5000
VIX	518,208	37.3516	13.6652	20.6900	32.4500	80.8600
Yield	189,090	8.2509	8.1279	0	6.4342	99.9779
Treasury Yield	510,861	2.3450	1.2020	0.0000	2.3211	4.7600
3 Mo. Treasury Yield	510,861	0.2014	0.1750	0.01	0.18	1.24
DGP Firm Dummy	518,208	0.2702	0.4440	0	0	1
Floating Dummy	518,208	0.0596	0.2368	0	0	1
Guaranteed Dummy	518,208	0.0162	0.1263	0	0	1
Junk Dummy	518,208	0.1499	0.3570	0	0	1

Panel B - Guaranteed Sample

Variable	N	Mean	SD	Min	Med	Max
Rating	8,406	4.1475	2.0591	0	5	21
Coupon	8,406	2.0650	0.8339	0.2305	2.1250	3.2500
Bond Age (Years)	8,406	0.3818	0.2416	0.0000	0.3589	0.9288
Leverage	8,406	0.4209	0.1822	0.0609	0.3433	0.8076
Ln(Issue Size)	8,406	0.6982	0.7280	-7.4186	0.6931	1.9095
Ln(Firm Size)	8,406	13.5682	1.0229	10.5645	13.5694	14.6145
Ln(Bid-Ask Spread)	3,537	-6.8139	1.2168	-14.0016	-6.6824	-2.7914
Insurance Premium	8,406	0.8568	0.4320	0	1.0000	1.6000
Price	8,406	101.5725	1.3187	96.0000	101.1868	106.0200
Maturity (Years)	8,406	2.4994	0.6323	0.6110	2.6658	3.7342
Maturity^2	8,406	6.6466	3.0112	0.3733	7.1062	13.9446
Baa-Aaa Spread	8,406	2.0389	0.7718	1.1100	1.8000	3.5000
VIX	8,406	32.0703	8.7047	20.6900	29.0000	68.5100
Yield	2,658	1.6266	0.4228	0.2519	1.6922	3.2232
Treasury Yield	8,406	1.2021	0.3277	0.2210	1.2416	2.2629
3 Mo. Treasury Yield	8,406	0.1675	0.0597	0.01	0.18	0.32
Floating Dummy	8,406	0.1927	0.3945	0	0	1
Junk Dummy	8,406	0.0067	0.0814	0	0	1

Table 24: Effect of Government Guarantee on Bid-Ask Spreads

This table displays results for the multivariate analysis testing the improvement of liquidity for guaranteed bonds. Guaranteed Dummy equals 1 if the bond issuance is guaranteed and 0 otherwise. This variable is then interacted with other variables to analyze the effect of the guarantee on the determinants of bond liquidity. Control variables concerning the determinants of bid-ask spreads follow Chakravarty, and Sarkar (2003) and are defined in Appendix C. The sample for this unbalanced panel regression consists of bonds issued by DGP participants trading within 180 days of the first confirmation of DGP participation. Standard errors are clustered by bond and date. T-statistics are in parenthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Dependent Variable	**Ln(Bid-Ask Spread)**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Guaranteed Dummy	-1.824***	-2.648***	-1.820***	-1.918***	-0.473	-0.538
	(-25.72)	(-17.37)	(-13.53)	(-17.61)	(-0.93)	(-0.90)
Guaranteed * Maturity		0.301***				0.223***
		(5.33)				(3.10)
Guaranteed * Rating			-0.001			-0.021
			(-0.03)			(-0.83)
Guaranteed * Ln(Issue Size)				0.101		0.157*
				(1.25)		(1.66)
Guaranteed * Ln(Firm Size)					-0.100***	-0.145***
					(-2.59)	(-3.53)
Ln(Issue Size)	-0.080***	-0.082***	-0.080***	-0.081***	-0.080***	-0.082***
	(-7.41)	(-7.52)	(-7.40)	(-7.46)	(-7.34)	(-7.54)
Ln(Firm Size)	0.008	0.008	0.008	0.007	0.011	0.012
	(0.71)	(0.79)	(0.71)	(0.64)	(0.97)	(1.06)
Rating	0.016*	0.015*	0.016*	0.016*	0.016*	0.017*
	(1.74)	(1.71)	(1.69)	(1.76)	(1.76)	(1.81)
Maturity	0.065***	0.065***	0.065***	0.065***	0.066***	0.065***
	(13.87)	(13.74)	(13.87)	(13.84)	(13.87)	(13.75)
Maturity^2	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.05)	(-6.97)	(-7.05)	(-7.04)	-7.07)	-7.00)
Bond Age	0.039***	0.039***	0.039***	0.039***	0.040***	0.039***
	(5.27)	(5.25)	(5.27)	(5.27)	(5.28)	(5.25)
Baa-Aaa Spread	0.235***	0.231***	0.235***	0.234***	0.234***	0.231***
	(7.14)	(7.03)	(7.14)	(7.11)	(7.13)	(7.03)
Floating Dummy	-0.203***	-0.204***	-0.203***	-0.198***	-0.199***	-0.190***
	(-2.77)	(-2.78)	(-2.77)	(-2.71)	(-2.72)	(-2.60)
Junk Dummy	-0.278***	-0.281***	-0.278***	-0.283***	-0.271***	-0.282***
	(-3.79)	(-3.79)	(-3.74)	(-3.83)	(-3.69)	(-3.74)
Constant	-5.658***	-5.656***	-5.659***	-5.647***	-5.701***	-5.706***
	(-30.16)	(-30.18)	(-30.00)	(-30.10)	(-29.98)	(-29.70)
Adj. R^2	0.408	0.410	0.408	0.409	0.409	0.410
T	232	232	232	232	232	232
N	1,966	1,966	1,966	1,966	1,966	1,966
Obs.	26,267	26,267	26,267	26,267	26,267	26,267

Table 25: Effect of Government Guarantee on Credit Spreads

This table displays results for the multivariate analysis of the cost of debt (credit spread) reduction for guaranteed bonds. The sample for this unbalanced panel regression consists of bond-day observations between Oct. 1, 2008 and Oct. 31, 2009. Standard errors are clustered by bond and date. T-statistics are in parenthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. All variables are defined in Appendix C.

SIC Codes	All	6000s	All	6000s	All	6000s	All	6000s
Dependent Variable	Credit Spread (Yield – Treasury)				Total Cost (Credit Spread + Premium)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guaranteed Dummy	-4.347***	-6.486***	2.963***	1.963	-3.287***	-5.451***	4.140***	2.996**
	(-8.45)	(-8.88)	(3.13)	(1.54)	(-6.34)	(-7.46)	(4.40)	(2.38)
Guaranteed * Rating			-1.119***	-1.264***			-1.147***	-1.261***
			(-9.74)	(-7.37)			(-10.10)	(-7.55)
Guaranteed * VIX			-0.122***	-0.151***			-0.126***	-0.153***
			(-10.97)	(-11.28)			(-11.45)	(-11.53)
Guaranteed * Maturity			0.539*	1.018***			0.591**	1.044***
			(1.96)	(5.77)			(2.17)	(6.15)
Guaranteed * Junk			-2.129	0.533			-1.697	0.443
			(-1.29)	(0.20)			(-1.04)	(0.17)
Rating	1.304***	1.453***	1.314***	1.474***	1.303***	1.453***	1.314***	1.474***
	(17.17)	(12.97)	(17.24)	(13.04)	(17.17)	(12.97)	(17.24)	(13.04)
VIX	0.151***	0.172***	0.152***	0.175***	0.151***	0.172***	0.152***	0.175***
	(17.32)	(14.91)	(17.16)	(14.63)	(17.32)	(14.91)	(17.16)	(14.63)
Maturity	-0.306***	-0.748***	-0.306***	-0.749***	-0.306***	-0.747***	-0.306***	-0.749***
	(-6.57)	(-9.72)	(-6.56)	(-9.73)	(-6.56)	(-9.72)	(-6.56)	(-9.73)
$Maturity^2$	0.008***	0.020***	0.008***	0.020***	0.008***	0.020***	0.008***	0.020***
	(5.74)	(8.74)	(5.73)	(8.77)	(5.74)	(8.74)	(5.73)	(8.77)
3 Mo. Treasury Yld	-0.174	1.765***	-0.182	1.744**	-0.174	1.765***	-0.182	1.743**
	(-0.32)	(2.65)	(-0.33)	(2.57)	(-0.32)	(2.65)	(-0.33)	(2.57)
Ln(Firm Size)	1.093***	0.555***	1.096***	0.555***	1.093***	0.556***	1.096***	0.556***
	(12.80)	(6.36)	(12.83)	(6.35)	(12.80)	(6.36)	(12.83)	(6.35)
Ln(Issue Size)	-0.403***	-0.665***	-0.404***	-0.666***	-0.404***	-0.665***	-0.404***	-0.666***
	(-7.67)	(-9.74)	(-7.68)	(-9.74)	(-7.67)	(-9.73)	(-7.69)	(-9.74)
Junk Dummy	1.240***	-3.600**	1.188***	-3.768***	1.241***	-3.602**	1.188***	-3.769***
	(3.73)	(-2.55)	(3.57)	(-2.66)	(3.73)	(-2.55)	(3.57)	(-2.66)
Coupon Rate	-0.072	-0.307*	-0.076	-0.308*	-0.073	-0.307*	-0.076	-0.308*
	(-0.79)	(-1.76)	(-0.83)	(-1.76)	(-0.79)	(-1.76)	(-0.83)	(-1.76)
Leverage	0.958	2.100**	0.910	2.100**	0.961	2.102**	0.911	2.101**
	(1.41)	(2.51)	(1.34)	(2.51)	(1.42)	(2.51)	(1.34)	(2.51)
Constant	-19.53***	-11.28***	-19.63***	-11.50***	-19.53***	-11.28***	-19.64***	-11.50***
	(-14.90)	(-6.46)	(-14.93)	(-6.53)	(-14.90)	(-6.46)	(-14.93)	(-6.53)
Adj. R^2	0.391	0.359	0.392	0.362	0.389	0.356	0.391	0.358
Days	105	105	105	105	105	105	105	105
Bonds	8,600	3,473	8,600	3,473	8,600	3,473	8,600	3,473
Obs.	187,092	57,902	187,092	57,902	187,092	57,902	187,092	57,902

Table 26: Effect of Government Guarantee on CSTS by Rating and VIX

This table displays results for the multivariate analysis of credit spreads for guaranteed bonds. The sample for this unbalanced panel regression consists of bond-day observations between Oct. 1, 2008 and Oct. 31, 2009. Standard errors are clustered by bond and date. The regressions in Panel A uses a subsample of bonds rated higher than A and a separate subsample of bonds rated lower than A. Panel B uses two subsamples of observations – those in the top quartile of VIX levels and those in the bottom quartile. T-statistics are in parenthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. All variables are defined in Appendix C.

Panel A: Split on Credit Rating

Bond Rating	(AAA, AA-)		(BBB+,NR)	
Dependent Variable	Credit Spread	Total Cost	Credit Spread	Total Cost
	(1)	(2)	(3)	(4)
Guaranteed Dummy	-1.924***	-0.725	14.098***	15.098***
	(-3.28)	(-1.26)	(13.15)	(14.08)
Maturity	-0.040	-0.040	-0.439***	-0.439***
	(-1.60)	(-1.60)	(-5.47)	(-5.47)
$Maturity^2$	0.001	0.001	0.012***	0.012***
	(1.40)	(1.40)	(5.11)	(5.11)
Guaranteed * Maturity	0.121	0.287***	0.644***	0.644***
	(1.22)	(4.17)	(3.65)	(3.65)
Guaranteed * Rating	0.024	-0.090	-1.717***	-1.717***
	(0.29)	(-1.08)	(-16.82)	(-16.82)
Guaranteed * VIX	-0.029	-0.039	-0.214***	-0.214***
	(-4.72)	(-7.18)	(-13.83)	(-13.83)
Rating	0.346***	0.347***	1.909***	1.909***
	(5.48)	(5.48)	(13.64)	(13.64)
VIX	0.063***	0.063***	0.219***	0.219***
	(14.16)	(14.16)	(15.02)	(15.02)
3 Mo. Treasury Yield	0.539**	0.539**	-2.189**	-2.189**
	(2.08)	(2.08)	(-2.30)	(-2.30)
Ln(Firm Size)	0.407***	0.407***	0.670***	0.670***
	(8.72)	(8.72)	(5.92)	(5.92)
Ln(Issue Size)	-0.178***	-0.179***	-0.124	-0.124
	(-8.12)	(-8.13)	(-0.84)	(-0.84)
Coupon Rate	-0.121	-0.121	0.266*	0.266*
	(-1.05)	(-1.05)	(1.88)	(1.88)
Leverage	1.821***	1.823***	-2.947*	-2.947*
	(6.48)	(6.49)	(-1.95)	(-1.95)
Constant	-5.673***	-5.671***	-23.501***	-23.501***
	(-10.51)	(-10.51)	(-11.91)	(-11.91)
Adj. R^2	0.221	0.213	0.443	0.442
Days	105	105	105	105
Bonds	2,070	2,070	3,533	3,533
Obs.	28,711	28,711	80,836	80,836
Slope of Guaranteed Term Structure	0.081	0.247***	0.205	0.205
	(0.79)	(3.37)	(1.06)	(1.06)

Table 26 (*continued*)

Panel B: Split on VIX Level

VIX Level	Bottom Quartile		Upper Quartile	
Dependent Variable	Credit Spread	Total Cost	Credit Spread	Total Cost
	(1)	(2)	(3)	(4)
Guaranteed Dummy	5.434***	6.634***	-2.064	-1.008
	(4.06)	(4.85)	(-1.15)	(-0.56)
Maturity	-0.242***	-0.242***	-0.493***	-0.493***
	(-4.32)	(-4.32)	(-7.99)	(-7.99)
Maturity^2	0.007***	0.007***	0.013***	0.013***
	(4.02)	(4.02)	(6.73)	(6.73)
Guaranteed * Maturity	0.355*	0.439**	1.311**	1.317**
	(1.84)	(2.31)	(2.11)	(2.12)
Guaranteed * Rating	-1.023***	-1.040***	-1.518***	-1.532***
	(-14.21)	(-14.34)	(-8.80)	(-8.90)
Guaranteed * VIX	-0.211***	-0.221***	-0.062***	-0.062***
	(-4.05)	(-4.16)	(-4.56)	(-4.57)
Rating	1.141***	1.141***	1.960***	1.960***
	(15.42)	(15.42)	(22.74)	(22.74)
VIX	-0.071	-0.071	0.072***	0.072***
	(-1.40)	(-1.40)	(5.96)	(5.96)
3 Mo. Treasury Yield	13.184***	13.176***	-0.039	-0.039
	(6.37)	(6.36)	(-0.12)	(-0.12)
Ln(Firm Size)	0.830***	0.830***	1.763***	1.763***
	(11.44)	(11.44)	(15.24)	(15.24)
Ln(Issue Size)	-0.383***	-0.383***	-0.638***	-0.638***
	(-6.06)	(-6.06)	(-9.39)	(-9.39)
Coupon Rate	-0.152	-0.153	-0.303**	-0.303**
	(-1.53)	(-1.53)	(-2.54)	(-2.54)
Leverage	-0.233	-0.229	5.168***	5.169***
	(-0.36)	(-0.35)	(6.67)	(6.67)
Constant	-11.563***	-11.566***	-26.271***	-26.271***
	(-8.40)	(-8.40)	(-15.18)	(-15.18)
Adj. R^2	0.463	0.462	0.409	0.408
Days	22	22	31	31
Bonds	6,502	6,502	6,347	6,347
Obs.	46,778	46,778	47,636	47,636

Table 27: Analysis of Government Guarantee on Firm-Level Default Risk

This table displays results for the two-stage multivariate regression analysis of the effect of DGP participation on firm-level default risk through the liquidity and rollover risk channels. The sample for this unbalanced panel regression consists of firm-day observations between Sept. 1, 2008 and Dec. 31, 2008 – with bond data in TRACE, firm data in COMPUSTAT, and CDS data in Datastream – in which CDS spread mid-quote prices are not "stale," or have moved on the observation day. Standard errors are clustered by firm and date. % Gntd. Volume is the percentage of the firm's bond volume traded on the observation date was guaranteed under the DGP program. Ln(Bid-Ask Spread) is the natural log of the volume-weighted average of the bid-ask spreads of the firm's bonds traded on the observation date. Std(Bid-Ask Spread) is the 5-day rolling standard deviation of the firm's volume-weighted average bid-ask spread. T-statistics are in parenthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. All variables are defined in Appendix C.

Table 27 (*continued*)

	First Stage				Second Stage			
Model	**1A**	**2A**	**3A**	**4A**	**1B**	**2B**	**3B**	**4B**
SIC Codes	**All**	**All**	**6000s**	**6000s**	**All**	**All**	**6000s**	**6000s**
Dependent Variable	**Ln(Bid-Ask Spread)**	**Std(Bid-Ask Spread)**	**Ln(Bid-Ask Spread)**	**Std(Bid-Ask Spread)**	**Ln(CDS)**	**Ln(CDS)**	**Ln(CDS)**	**Ln(CDS)**
% Gntd. Volume	-1.093***	-0.324***	-0.980***	-0.312***				
	(0.000)	(0.000)	(0.000)	(0.000)				
Ln(Bid-Ask Spread)					0.841**		1.305***	
(predicted)					(0.011)		(0.003)	
Std(Bid-Ask Spread)						3.552***		2.969***
(predicted)						(0.008)		(0.002)
3 Mo. Treasury	-0.227**	-0.054	-0.534***	-0.224***	0.133	0.109	0.548*	0.485
	(0.023)	(0.300)	(0.001)	(0.008)	(0.261)	(0.602)	(0.074)	(0.133)
Ln(Firm Size)	0.041	-0.063***	-0.038	-0.099***	0.195***	0.534***	0.280*	0.265
	(0.308)	(0.000)	(0.554)	(0.001)	(0.000)	(0.000)	(0.070)	(0.110)
Leverage	-0.344	-0.338**	-0.634***	-0.447**	1.377***	2.622***	2.545***	2.009***
	(0.144)	(0.026)	(0.007)	(0.018)	(0.001)	(0.000)	(0.001)	(0.009)
Junk Dummy	0.117	-0.116	0.493		0.323	0.090	0.397	
	(0.464)	(0.486)	(0.171)		(0.126)	(0.873)	(0.649)	
Rating	-0.003	0.017	0.023	0.035***	0.206***	0.197***	0.368**	0.297***
	(0.898)	(0.207)	(0.781)	(0.008)	(0.000)	(0.000)	(0.028)	(0.009)
Baa-Aaa	0.058	-0.031	-0.348***	-0.192***	0.272***	0.396***	0.369*	0.356
	(0.424)	(0.455)	(0.001)	(0.008)	(0.000)	(0.008)	(0.087)	(0.188)
Constant	-5.595***	1.525***	-3.173***	2.540***	4.905***	-6.379***	4.856*	-2.592
	(0.000)	(0.000)	(0.005)	(0.000)	(0.003)	(0.008)	(0.060)	(0.470)
Adj. R^2	0.015	0.078	0.042	0.230				
Firms	223	103	30	12	223	103	30	12
Days	82	82	81	80	82	82	81	80
Obs.	4,046	1,742	611	416	4,046	1,742	611	416

Table 28: Effect of DGP Participation Announcement on Non-guaranteed Bond Liquidity

This table presents a difference-in-differences analysis of the effect of DGP participation announcements on bid-ask spreads of non-guaranteed bonds. Control variables concerning the determinants of bid-ask spreads follow Chakravarty, and Sarkar (2003). All variables are defined in Appendix C. The sample for these regressions consists of bond-day observations between Sept. 1, 2008 and Dec. 31, 2008. The standard errors are clustered by bond and date. T-statistics are in parenthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively. All variables are defined in Appendix C.

SIC Codes	All	6000s	All	6000s
Dependent Variable	**Ln(Bid-Ask Spread)**			
	(1)	**(2)**	**(3)**	**(4)**
DGP Firm Dummy	0.559***	0.151***	0.184***	0.067
	(13.41)	(2.56)	(3.36)	(0.88)
Post Announcement Dummy	0.105**	-0.111*	-0.017	0.040
	(2.31)	(-1.95)	(-0.30)	(0.65)
DGP Firm * Post Announcement	-0.177***	0.016	-0.120***	-0.120*
	(-4.45)	(0.26)	(-2.82)	(-1.74)
Ln(Firm Size)			0.089***	0.067***
			(7.53)	(3.20)
Ln(Issue Size)			-0.051***	-0.044***
			(-6.30)	(-3.40)
Rating			0.040***	0.053**
			(5.90)	(2.04)
Maturity			0.065***	0.050***
			(18.05)	(10.34)
Maturity^2			-0.001***	-0.001***
			(-9.77)	(-5.36)
Bond Age			0.025***	0.015*
			(7.25)	(1.78)
Baa-Aaa Spread			0.101**	-0.016
			(2.05)	(-0.31)
Floating Dummy			-0.305***	-0.607***
			(-4.40)	(-5.07)
Junk Dummy			-0.586***	-0.891***
			(-7.99)	(-4.14)
Constant	-4.590***	-4.166***	-6.416***	-5.649***
	(-100.15)	(-79.07)	(-32.31)	(-15.22)
Adj. R^2	0.038	0.008	0.178	0.151
T	85	85	83	83
N	5,143	1,677	5,143	1,677
Obs.	42,367	12,923	42,305	12,911