Regulation of Fair Disclosure and Credit Market

Yutao Li[*]
Anthony Saunders[†]
Pei Shao[‡]

This Version: March 2012

Abstract

This paper studies how the implementation of Regulation of Fair Disclosure (Reg FD) affects the credit market. We argue that, although disclosing private information to lenders is exempt from Reg FD, this regulation imposes an additional disclosure risk on borrowers. We expect that borrowers will reduce information disclosure and increasingly rely on relationship lenders who have produced proprietary information about borrowers from their prior interactions. Our empirical results show that switching to new (non-relationship) lenders become more expensive after Reg FD because non-relationship lenders face higher information production costs when firms reduce information disclosure. In addition, we also find that borrowers are more dependent on relationship banking; lead lenders retain a larger fraction of the loans they syndicate; the secondary loan bid-ask spread significantly increases following the implementation of Reg FD. We interpret these findings as evidence of increased level of information asymmetry in the credit market.

JEL: G28, G21, D82

---

[*] Assistant Professor in Accounting, Faculty of Management, University of Lethbridge, E-mail: Yutao.li@uleth.ca
[†] Professor in Finance, Stern School of Business, New York University, E-mail: asaunder@stern.nuy.edu
[‡] Assistant Professor in Finance, Faculty of Management, University of Lethbridge, E-mail: shao@uleth.ca

1

1. Introduction

Securities and Exchange Commission's (thereafter, SEC) Regulation of Fair Disclosure (thereafter, Reg FD) took effect on October 23, 2000. Reg FD imposes restrictions on selective disclosure of material non-public information to the equity market professionals, such as institutional investors and financial analysts.[1] The intention of Reg FD is to level the playing field for investors by requiring full public disclosure of information to all market participants. However, both academics and practitioners express their concerns about the potential "chilling effects", which arise from a reduction in information disclosed by firms following the adoption of this regulation.[2]

Prior research investigating the impact of Reg FD on companies' disclosure practice and information quality yields mixed results.[3] One of the big challenges facing this strand of research is to measure the quantity and quality of information. In a recent investigation, Sidhu, Smith, Whaley, and Willis (2008) extract the adverse selection component from stock bid-ask price and show that such component increases after Reg FD. In addition, Duarte, Han, Harford, and Yang (2008) document that cost of equity for firms traded on NASDAQ increases in the post-Reg FD period. Both papers suggest that information quantity and quality in the equity market declines following the effectuation of Reg FD.

---

[1] SEC's (2000) final ruling on Reg FD states that "four categories of persons to whom selective disclosure may not be made absent a specified exclusion. The first three are securities market professionals -- (1) broker-dealers and their associated persons, (2) investment advisers, certain institutional investment managers and their associated persons, and (3) investment companies, hedge funds, and affiliated persons. These categories will include sell-side analysts, many buy-side analysts, large institutional investment managers, and other market professionals who may be likely to trade on the basis of selectively disclosed information. The fourth category of person included in Rule 100(b)(1) is any holder of the issuer's securities, under circumstances in which it is reasonably foreseeable that such person would purchase or sell securities on the basis of the information".

[2] For example, the association for Investment Management and Research (now the CFA Institute) argues, "Corporations will almost certainly curtain the information flow to the market to avoid having to decide on the spot whether certain information will be deemed to be material after the fact by the SEC…" (AMIR, 2000).

[3] There is mixed evidence with regard to firms' disclosure behavior after Reg FD. For example, while Wang (2007) and Gome, Gorton, and Madureira (2008) show that some firms reduce their public disclosure following the adoption of Reg FD, Bushee, Matsumoto, and Miller (2004) suggest that firms do not reduce their disclosure through open conference calls).

While most of studies focus on the effect of Reg FD on the equity market or its participants such as financial analysts, relatively little is known how this regulation influences the credit market and its participants. To fill this gap in the literature, this paper examines how Reg FD affects the level of information asymmetry among different the credit market participants.

Although Reg FD provides an exemption for communication of private information with creditors, such exemption is conditional upon creditors abiding by confidentiality agreement (SEC, 2000). As a result, companies may bear an additional disclosure risk of making privately-disclosed material information public once creditors break the confidentiality agreement.[4] In this situation, firms may choose to disclose less information or rely on certain type of lenders who are considered more trustworthy.[5] In the meantime, Reg FD eliminates the selective disclosure to the equity market professionals, disrupting potential information flow from these professionals to private loan lenders.

To examine whether information flow reduces in the credit market after Reg FD, we investigate three layers of information asymmetries identified in the prior literature. First, information asymmetry exists between borrowers and lenders (Diamond, 1984, 1991; Boyd and Prescott, 1986). The extant literature provides evidence that relationship lenders, having invested

---

[4] SEC, in its final ruling, puts forth that "if a reporting issuer releases material information non-publicly during an unregistered offering with no such understanding about confidentiality, we believe that disclosure under Regulation FD is appropriate….". SEC further states that "Public companies undertaking unregistered offerings will need to consider the impact their selective disclosure could have on any exemption they use. Before an exempt offering begins, issuer's counsel should advise the client of the potential complications that selective disclosure of material non-public information could raise." (See SEC Final Rule: Selective Disclosure and Insider Trading", 2000)

[5] Another argument could be that borrowers are more willing to deal with lenders who are less likely to break the confidentiality wall. According to Ivashina and Sun (2011), unlike relationship lenders, transactional lenders (such as hedge fund lenders and other institutional lenders) are more likely to trade on private information obtained through their participating in loan syndications. Another paper by Massoud, Nandy, Saunders, and Song (2011) focus on hedge fund short selling and make a similar argument.

in collecting and generating reusable proprietary information about borrowers through multiple interactions with them in the past, face lower information asymmetry relative to non-relationship lenders (Boot, 2000; Bharath, Dahiya, Saunders, and Srinivasan, 2011). If firms choose to disclose less information in both public and private domains due to higher disclosure risk imposed by Reg FD, non-relationship lenders may find it more difficult to collect information and thus need to incur higher information production costs to assess credit worthiness of borrowers. Accordingly, we hypothesize that switching to new (non-relationship) lenders becomes more costly after Reg FD.

Second, information asymmetry also exists between lead lenders and participating lenders in loan syndications (Dennis and Mulineaux, 2000; Sufi, 2007; Panyagometh and Roberts, 2010). Bharath *et al.* (2011) suggest that relationship banking can alleviate 'syndicate moral hazard' problem induced by this information asymmetry. With information advantage and lower cost of continuous monitoring, relationship lenders have less incentive to shirk from their monitoring commitment when they lead a loan syndicate, reducing the chance of 'syndicate moral hazard'. Moreover, Boot (2000) argues that disclosing information to relationship lenders can relieve borrowers' concern about potential information leakage to competitors. If Reg FD imposes higher disclosure risk and causes borrowers to convey less information, we expect that both borrowers and participating lenders will be more inclined to deal with relationship lenders. Therefore, we predict that there is an increase in relationship banking intensity after Reg FD.

In addition to the above discussed implication, the information asymmetry between lead and participating lenders also affects loan syndication structure. Sufi (2007) shows that holding a larger proportion of loans by lead lenders helps resolve adverse selection and 'syndicate moral hazard' problems. If reduced information flow widens the information asymmetry between lead

4

and participating lenders, we expect that lead lenders will retain a greater percentage of loans they syndicate.

Finally, information asymmetry exists between secondary loan market buyers and sellers. Loan buyers are considered relatively uninformed because they evaluate firms mainly based on information gathered from public domain or information provided by sellers with confidential material being stripped off. In contrast, loan sellers are informed because they have regular access to private and otherwise privileged information through private communications with borrowers. If Reg FD increases the information gap between loan buyers and sellers, we hypothesize that the bid-ask spread of loans traded on the secondary loan market will increase after Reg FD.

We test our hypotheses through analyzing syndicated loans issued before and after Reg FD in one-year, three-year, and five-year windows.[6] We focus on the results in one-year window, where there is less concern about contaminated events. To test our last hypothesis, we investigate the average loan bid-ask spread in a one-month window surrounding the implementation of Reg FD.

Specifically, we first apply standard difference-in-differences analysis approach and run a loan spread regression controlling for firm fixed effects. We find that borrowers need to pay 31 basis points more in interest rate (represents $465,000 additional annual interest payment for borrowing a typical /median size loan in our sample) to switch to new lenders after Reg FD compared to the interest rate they pay before Reg FD. This result remains robust in one-year, three-year, and five year windows, supporting our hypothesis that switching to new lenders becomes more costly in the post Reg FD period. We attribute this finding to a greater increase in

---

[6] We remove all the loan issues made in year 2000. In one-year window, we compare loans issued in year 1999 to those issued in year 2001.

the level of information asymmetry between borrowers and non-relationship lenders than that between borrowers and relationship lenders.

Next, we investigate the change in relationship banking intensity associated with loans issued before and after Reg FD. Consistent with our prediction, we find that borrowers (and/or participating lenders) become more dependent on relationship lenders. This finding supports the notion that, relationship lenders play a more important role in reducing borrowers' concern about high disclosure risk and/or participating lenders' concern about 'syndicate moral hazard' in the post Reg FD period.

Focusing on loan syndication structure, we find that, when forming a loan syndicate, lead lenders retain a higher percentage of loans after Reg FD, suggesting that there is an increased need for lead lenders' certification when information asymmetry increases between lead and participating lenders in the primary loan market.

Lastly, the evidence from the secondary loan market consistently supports our prediction that the asymmetric information problems are exacerbated after Reg FD. In particular, we find that the average loan bid-ask spread significantly increases from the month before to the month after the implementation of Reg FD.

To address the concern that potential contaminated events both at market level and at corporate level (e.g., the burst of internet bubble, economic recession, 911, and a variety of corporate scandals) may drive our results, we use private firms as a control group (*i.e.* a group that is not subject to SEC regulation) and conduct the same tests on cost of debt, relationship banking intensity, lead lender shares, as well as loan bid-ask spread in the same time horizon. We do not find any significant results for private firms as what we find for public firms. In addition, we switch the event year/month and conduct the same analysis centered on a number of

hypothetical event years/months.[7] We find that the above reported results are only significant when we use the actual event year/month, but not significant when we use any other hypothetical event year/month. Accordingly, we conclude that our results are not driven by potential time-related trends in the variables of interest.

Our study contributes to both the Reg FD literature and banking literature. First, utilizing the three layers of information asymmetry in the credit market, we analyze the impact of Reg FD on the credit market and reveal an unintended consequence of this regulation. Our findings complement the recent studies that document an increase in the level of information asymmetry in the equity market (Sidhu *et al*., 2008; Duarte *et al*., 2008).

Second, this paper provides new insight into the role of relationship banking. The existing theories predicting how relationship banking will impact on borrowers have never reached consensus on whether relationship banking will benefit or impose additional costs on borrowers (e.g. Sharpe,1990; Greenbaum *et al.*,1989;Boot, 2000; Boot and Thakor,1994). Empirical investigations also produce some controversial results. Bharath *et al*. (2011) document that, from borrower's perspective, benefits of relationship banking include lower cost of debt, larger loan amount, and less restrictive collateral requirements. Using IPO as an information-releasing event, Schenone (2010) shows that relationship lenders are not able to charge borrowers information rent any more after they go public. Gopalan *et al*. (2011) reveal another potential cost of borrowing from relationship lenders, that is, exclusively sourcing funds from relationship lenders may impose financial constraints on firms at certain stage of their life (e.g. high growth period). Along the same line, Ioannidou and Ongena (2010) provide evidence that borrowers switch to new lenders to lower their cost of borrowing. Unlike many other papers in this literature, we take the adoption of Reg FD as an exogenous information event, which allows

---

[7] In the tests for secondary loan bid-ask spread, we focus on one-month windows.

us to eliminate potential endogeneity problems associated with banking relationships. This paper reveals that relationship lenders do not exploit borrowers by charging higher information rent even when relationship lenders' information advantage is enhanced by the exogenous shock.

Third, our study also carries an important message for regulators and policy makers. We show that Reg FD leads to a "chilling effect" in the credit market and widens the information asymmetry among the credit market participants. In 2010, SEC made an important amendment to Reg FD and removed the exemption for disclosure made to credit rating agencies.[8] Given the evidence shown in this paper, we conjecture that this new amendment may further exacerbate asymmetric information problems between borrowers and outside lenders because those outside lenders who heavily rely on credit rating agencies to gather firm-specific information in the past will be in a more disadvantageous position.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops our hypotheses. Section 3 discusses our sample and methodology. Section 4 reports the empirical results while section 5 concludes.

2. Literature Review and Hypotheses Development

Our study is related to two streams of literature, Reg FD literature and banking literature. In this section, we review the literature and motivate our empirical hypotheses.

2.1 Literature of Reg FD

The objective of Reg FD is to level the playing field for investors by requiring full public disclosure of material information to capital market participants. Proponents for this regulation argue that fair disclosure reduces the information advantage of selected market professionals

---

[8] This amendment implements Section 939B of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, which requires that the Securities and Exchange Commission amend Regulation FD to remove the specific exemption from the rule for disclosures made to nationally recognized statistical rating organizations and credit rating agencies for the purpose of determining or monitoring credit ratings.

who are given privileged access to private information before Reg FD, and consequently, this regulation can increase investors' confidence in capital market. The opponents to this regulation, however, contend that Reg FD leads to a "chilling effect" with firm reducing information disclosure to the market. For example, AMIR (2000) comments that, to avoid potential litigation risk, firms need to exert greater efforts in determining whether certain information will be deemed to be material by the SEC. In addition to the litigation risk, making proprietary information public may endanger the firms' competitive position. As a result, AMIR (2000), suggests that firm information environment may be worsened after the implementation of Reg FD.

Researchers investigate whether Reg FD has led firms to release more or less information by directly examining firms' disclosure behavior surrounding the implementation of Reg FD. Evidence in this strand of research is mixed.[9] Wang (2007) documents that firms with higher disclosure costs reduce public disclosure more than firms with lower disclosure costs after Reg FD. In contrast, Heflin *et al.* (2003) find that there is an increase in management forecasts in the post- Reg FD period. Gome, Gorton, and Madureira (2008) document that while large firms make more earnings pre-announcement after Reg FD, small firms do not do so. Bushee, Matsumoto, and Miller (2004) suggest that Reg FD does not affect firms' disclosure practice through hosting conference calls.

While there is no consistent evidence on how Reg FD alters firms' disclosure practice, a more difficult task is to determine whether the quality of the information declines after Reg FD.

---

[9] Another stream of research focuses on the impact of Reg FD on analyst forecast and also presents mixed results. While Heflin *et al*. (2003) report that there is no significant change in analyst forecast accuracy and dispersion after Reg FD, Agrawal, Chadha, and Chen (2005) document that analysts' forecasts become less accurate and more dispersed after Reg FD. In addition, Gintschel and Markov (2004) show that the information content of analyst reports decreases as stock price becomes less responsive to the release of earning forecasts (reduced by about 28%) in the post- Reg FD period.

In other words, it is not known whether firms choose to retain more material information and make less informative disclosures after Reg FD. To answer this question, Sidhu *et al.* (2008) examine the level of information asymmetry in the equity market and show that the adverse selection component of the bid-and-ask spread increases after Reg FD. This finding suggests that the quality of information declines in the market place. In addition, Duarte *et al.* (2008) show that the cost of equity for firms traded on NASDAQ increases after Reg FD, also implying that there is deterioration in firms' information quality.[10]

Our research is related to two recent works motivated by the exemptions available under Reg FD. Reg FD provides exemptions for firms' communications of private information with lenders and with credit rating agencies.[11] [12] Motivated by the first exemption, Chen (2012) examines whether the implementation of Reg FD has caused significant shift in firms' financing channel from equity financing to debt financing. She attributes her finding of firms issuing more debt than equity after Reg FD to firms' intention to avoid public disclosure. Motivated by the second exemption, Jorion *et al.* (2005) demonstrate that stock price responds to announcements of credit rating upgrade (downgrade) more significantly after Reg FD, implying that information is less widely distributed in the market after Reg FD.

Overall, the evidence from the equity market suggests that it is likely that Reg FD has led to a "chilling effect". Whether this regulation has affected the information flow in the credit market remains an unanswered question. In addition, as per SEC final ruling, when firm releases material private information to a lender, it bears a risk of disclosing such information to public if

---

[10] But such evidence is not found for firms traded on NYSE.

[11] SEC (2000) states that "the third exclusion from coverage in Rule 100(b)(2) is for disclosures to an entity whose primary business is the issuance of credit ratings, provided the information is disclosed solely for the purpose of developing a credit rating and the entity's ratings are publicly available".

[12] SEC (2000) states that "Rule 100(b) (2) sets out four exclusions from coverage. The first, as proposed, is for communications made to a person who owes the issuer a duty of trust or confidence -- *i.e.*, a "temporary insider" -- such as an attorney, investment banker, or accountant. The first, as proposed, is for communications made to a person who owes the issuer a duty of trust or confidence."

the confidentiality agreement is not appropriately maintained. Given this additional uncertainty, firms may choose to retain material information even when they communicate with lenders, for example, information about management projections and potential investment projects; the reduced disclosure would lead to the reduction of the quantity and quality of information for the credit market participants.[13] In this paper, we intend to examine whether the information likewise reduces in the credit market.

2.2 Related Banking Literature

2.2.1 Three Layers of Information Asymmetries in the Credit Market

To investigate whether Reg FD leads to a "chilling effect" in the credit market, we need to first understand the different layers of information asymmetry in this market. First, information asymmetry exists between borrowers and lenders, leading to moral hazard and adverse selection problems. When lending to a borrower for the first time, a financial intermediary (*i.e*., lender) faces asymmetric information problems, *i.e*., the information about firms' credit worthiness and future projects cannot be credibly conveyed to lenders. Consequently, the lender has to invest in costly information production and extend due diligence efforts to screen out potential bad borrowers to avoid the risk of adverse selection. After lending to a borrower with an acceptable risk, the lender must continue to monitor the borrower to prevent the borrower from using the loan to make poor investment or undertake excessive risk (moral hazard problem). Thus, asymmetric information problems existing in this lending process justify the need for a financial intermediary to play a special role as screeners and delegated monitors (Leland and Pyle, 1977; Diamond, 1984, 1991; Ramakrishnan and Thakor, 1984; Boyd and Prescott, 1986; James, 1987).

---

[13] The reduced disclosure to lenders may increase cost of debt. Borrowers will have to weigh the cost of borrowing and the cost of additional litigation in this setting and seek alternative borrowing channels to which they may be able to disclose less but still obtain low cost of debt.

Second, information asymmetry exists between lead and participating lenders in loan syndications (Dennis and Mulineaux, 2000; Sufi, 2007). In a loan syndicate, monitoring responsibilities are delegated to lead lenders. Participating banks typically rely on lead arrangers to perform due diligence and obtain information from information memo (IM) prepared by the lead arrangers before a loan is originated.[14] Sufi (2007) and others show that lead lenders take a larger portion of a loan when the borrower's level of asymmetric information is higher. Moreover, Lin, Ma, Malatesta, and Xuan (2011) finds that lead lenders hold a greater fraction of loan to address the separation of ownership and control problem in corporations.

Third, information asymmetry also exists between loan buyers and sellers in the secondary loan market.[15] Loan buyers, as prospective lenders, are relatively uninformed because they evaluate firms mainly based on publicly available information. Unlike loan buyers, sellers (incumbent lenders) are more informed because they have been regularly given access to private and otherwise privileged information through private communications with borrowers. Wittenberg-Moerman (2009) identifies several factors that drive loan bid and ask spread, an indicator of the level of information asymmetry between loan sellers and buyers.[16]

---

[14] During the loan syndication process, lead arrangers prepare an information memo (IM) which contains private information about borrower. Loan offerings are confidential offerings made only to qualified banks and accredited investors. If a firm is seeking funds from nonbank investors, the arrangers often prepare a "public" version of IM which is stripped of all confidential material private information (A guide to the loan market, Standard & Poor's, 2011).

[15] Subjecting to several types of loan assignment covenants (such as borrower consent, lead lender consent, minimum assignment size, and assignment fee), most of the loans can be traded on the secondary loan market, an over-the-counter market facilitating loan transactions via a network of brokers. The anecdotal evidence shows that the most active traders in this market are non-bank institutional loan investors.

[16] Some recent studies utilize a unique dataset "secondary mark-to-market loan pricing" to explore the development of the secondary loan market and its implications on borrowers (e.g., Gande and Saunders, 2011; Wittenberg-Moerman, 2009; Santos and Nigro, 2008; Kamstra, Roberts and Shao, 2012; Drucker and Puri, 2009)16. While academics recognize some positive effects brought by the secondary loan market, such as increased liquidity, facilitating banks' portfolio and risk management approach, increased participation of non-bank institutional investors, the development of this market raises concerns that the uniqueness of banks may diminish due to the reduced monitoring incentives attendant with direct loan resale.

2.2.2 Information Asymmetry and Relationship Banking

Banking literature suggests that there are two types of lenders, relationship lenders and non-relationship lenders. By definition, relationship lenders are those who have had multiple interactions with borrowers in the past, during which they have made investments in obtaining and generating reusable proprietary information (Boot, 2000). For this reason, relationship lenders are considered to have information advantage over non-relationship lenders.

The extant literature posits that relationship lending can reduce the information asymmetry between borrowers and lenders, alleviate borrower moral hazard, and mitigate adverse selection and moral hazard problems in loan syndications (*e.g*., Boot, 2000; Bharath *et al*., 2011).

Boot (2000) argues that producing proprietary information is costly as lenders need to invest in collecting information and conducting further analysis to develop their own in-depth knowledge. Because relationship lenders have made such efforts in producing proprietary reusable information in the past, sourcing fund from relationship lenders is likely to ease adverse selection concerns. Moreover, holding more information, relationship lenders are also better able to monitor borrowers and prevent borrower from taking excessive risk (moral hazard problems).

Bharath *et al.* (2011) further argue that the proprietary information held by relationship lenders helps lower the monitoring costs (*i.e.* further investment in collecting information) and reduce "syndicate moral hazard" problems. Such moral hazard problem arises because lead lenders, delegated monitors, have incentive to shirk from quality monitoring. Facing lower monitoring costs, relationship lenders are in a better position to maintain their commitment to continuous monitoring of borrowers. Thus, when relationship lenders lead a loan syndicate, participating lenders may have less concern about syndicate moral hazard problems.

2.2.3 Relationship Banking and Cost of Borrowing

Regarding the question how relationship banking impacts on cost of borrowing, there are two competing views.[17] One view is that relationship banking reduces the cost of borrowing (Benefit of Relationship Banking Hypothesis).[18] For example, Bharath *et al.* (2011) argue that, due to the lending risks posed by potential adverse selection and moral hazard problems, lenders invest in costly information production and due diligence efforts to screen out potential bad borrowers. After lending to a borrower, lenders must continue to monitor to prevent the borrower from using loans to make poor investment. Through multiple interactions with the same borrower, information production and monitoring costs reduce. If relationship lenders share the cost savings with the borrowers, borrowers can benefit from the enhanced bank relationship, leading to a lower cost of borrowing or less stringent borrowing terms.

Another view suggests that relationship lenders could "lock up" borrowers due to the information advantage of relationship lenders over outside lenders (non-relationship lenders).[19] Sharpe (1990) and Greenbaum *et al.* (1989) predict that relationship lenders charge monopoly rents from the information advantage earned from the past borrower-lender relationship, leading to a higher cost of borrowing (Information Rent Hypothesis).

---

[17] Another argument about the role of relationship banking centers on whether relationship banking relieves or exacerbates firms' financial constraints. The evidence of the relief of financial constraints is often found in small firms (e.g., Petersen and Rajan, 1994; Berger and Udell,1995; Cole, 1998), while the reverse side of the story shows that strong banking relationships exacerbates large firms' financial constraints when firms experience high rate of growth or sharp increase of borrowing risk (e.g., Houston and James, 1996; Santos and Winton, 2008). A recent paper by Goplan, Udell, and Yerramilli (2011) proposes a life-cycle hypothesis by showing that, unlike small firms, mid-size public firms switch to new lenders to enhance their access to credit market, relieve financial constraints, increase capital investment, and achieve high growth rate. Thus, their paper reveals a potential cost of relationship banking that exclusive banking relationship may hinder firms' growth in the rapid growth phase of the life cycle.

[18] Boot and Thakor (1994) predict that borrowers first accept above-market spot borrowing costs but receive below-market spot cost from relationship lenders after the first success in project.

[19] Sharpe (1990) and Greenbaum *et al.* (1989) predict that, to develop a relationship, lenders first compete for firms by offering a rate below the market spot borrowing cost, but borrowing rate increases with borrower-lender relationship intensity in equilibrium.

The empirical evidence in regard to the correlation between relationship banking and cost of debt is ambiguous. For example, while Berger and Udell (1995) show that borrowing costs decrease with the length of the lending relationship in small firms supporting the benefit of relationship banking hypothesis, Degryse and Van Cayseele (2000) find the opposite results supporting the information rent hypothesis.[20]

Using the number of (or the amount of) repeated lending from a lender to a borrower to capture the relationship banking intewnsity, Bharath *et al*. (2011) and Schenone (2010) add new evidence to the debate over the role of banking relationship. Bharath *et al.* (2011) show that repeated lending lowers the loan spread by 10-17 basis points supporting the benefit of relationship banking hypothesis. Schenone (2010) uses a similar measure and demonstrates that lenders are able to charge monopoly rents before borrowers go public and such monopoly rents diminish after borrowers become public firms with less information opacity. In addition, using Bolivian data, Ioannidou and Ongena (2010) show that borrowers receive a significant lower rate initially when they borrow from a new (non-relationship) lender; however, the interest rate sharply increases when the new lender made subsequent loans to the borrowers, directly supporting "information rent hypothesis".

2.3 Hypothesis Development

The main objective of our empirical investigation is two-fold. First, we examine how Reg FD affects the information flow in the credit market. Second, taking the implementation of Reg FD as a significant exogenous information event, we try to provide new insight into the debate on the role of relationship banking. In particular, we answer the question whether relationship

---

[20] The traditional measure of relationship banking intensity is the loan maturity with an underlying assumption that banking relationship intensifies with the length of a loan term.

banks will share the benefit or take opportunity to exploit borrowers when the market is hit by an exogenous information shock.

As discussed in the previous sections, Reg FD prohibits selective disclosure to the equity market participants. In the private debt market, although communications of material information with lenders in private offerings are exempt from Ref FD, issuing firms still face higher disclosure risk if there is a breach of confidentiality agreement by the lenders. If firms choose to disclose less information to avoid additional risk, or if lenders rely on the selective disclosure to obtain firm-specific information, we expect that after the adoption of Reg FD, the information asymmetry increases between borrowers and lenders, between lead lenders and participating lenders, and also between loan buyers and sellers.

To test our prediction, we first investigate the information asymmetry problems between borrowers and lenders through comparing cost of debt when borrowing from relationship lenders *vs.* non-relationship lenders. As per relationship banking literature, relationship lenders hold proprietary information about borrowers generated from their past interactions with the borrowers. In other words, the level of information asymmetry between relationship lenders and borrowers is less than that between new lenders (non-relationship lenders) and borrowers. As such, we expect that relationship lenders are less affected by the information reduction arising from the adoption of Reg FD. In contrast, this information reduction should be particularly detrimental to non-relationship lenders. Lacking prior knowledge about borrowers, non-relationship lenders may find it more difficult and costly to produce information either because borrowers intentionally disclose less information or because non-relationship lenders have lost access to information through selective disclosure.[21] Consequently, non-relationship lenders

---

[21] For example, before Reg FD, bank affiliated equity analysts were able to receive selectively disclosed information from a firm and then such information could be analyzed and used by commercial banking departments. However,

might have to incur higher information production costs to evaluate borrowers' credit worthiness than relationship banks do after Reg FD. Accordingly we develop our first testable hypothesis:

H1. Due to higher information production costs faced by non-relationship lenders, switching to new lenders becomes more costly after Reg FD.[22]

Next, we predict that relationship banking intensity will increase after Reg FD. As we discussed before, Reg FD may have imposed additional disclosure risk on borrowers. Relying on the mutual trust and confidence built through multiple interactions in the past, however, borrowers will have less concern about privately-communicated information being spilled over to their competitors when they deal with relationship banks (Boot, 2000). Furthermore, when forming a loan syndicate, participating lenders are more willing to work with relationship lenders because relationship lenders have lower costs of continuous monitoring compared to non-relationship lead lenders (Bharath *et al.*, 2011). We expect this advantage of relationship lender over non-relationship lenders is strengthened when there is less information flow on the market. Thus, participating lenders are less concerned about "syndicate moral hazard" problems in a loan led by a relationship lender. Based on the above two arguments, we develop our second testable hypothesis:

H2. The average relationship banking intensity of borrowers increases after Reg FD.

Furthermore, similar to outside non-relationship lenders, participating lenders, if never lent to a firm before, have less access to information about borrowers after Reg FD, causing an

---

Reg FD turns off this information channel for non-relationship banks.

[22] Competing theories have suggested that relationship lending can either increase or decrease the cost of borrowing. On the one hand, repeated lending can reduce the future information production costs arising from past efforts. When relationship lenders share this saving with borrowers, the cost of debt will be lower. On the other hand, if relationship lenders exploit their information advantage, they may "lock in" borrowers and charge information rent leading to a higher cost of borrowing. However, this information rent extraction effect is more likely to exist in firms with high level of information opacity such as small private firms with very limited access to funds beyond relationship lenders (Bharath *et al.*, 2011). Since our sample only consists of public firms, we expect that the benefit of relationship banking dominates the information rent extraction effect.

increase in the level of information asymmetry between lead and participating lenders.

According to loan syndication structure literature, holding more shares in loans by lead lenders

will help resolve the information asymmetry problems (adverse selection and moral hazard)

among syndicate members (Sufi, 2007). Accordingly, we posit our third hypothesis:

     H3. The average lead lender share in the loan syndications increases after the Reg FD.

     Lastly, we examine the information asymmetry existed between secondary loan market

buyers and sellers. We intend to provide evidence that the information flow also reduces in this

market. If Reg FD has caused a reduction in information available for prospective investors (loan

buyers), we expect that the information asymmetry measured by loan bid-ask spread be widened

after Reg FD. Accordingly, we form our fourth hypothesis:

     H4: Bid-ask spread increases in the secondary loan market after Reg FD.[23]

3. Sample and Methodology

3.1 Sample

     Our initial data include all the *Dealscan* loans issued by the U.S. firms between 1995 and

2005. To allow for a period of time during which firms and other affected parties absorb

information and react to the change of the regulation, we omit all the loans issued in the year of

2000 in which Reg FD was formally implemented. We choose our sample from 1995 to 2005 is

because we center on the year of 2000 and allow a five-year window before and after the event

year. Our initial data consists of 60,529 U.S. loan facilities. After matching our sample with the

Compustat through the link between Dealscan and Compustat kindly offered by Michael

Roberts, we are left with a sample of 24,880 observations.[24] Financial and accounting variables

from Compustat are retrieved at the last fiscal year end prior to the year of loan deal origination.

---

[23] We expect that all the above four hypotheses are only applicable for public firms (regulated firms), but not for private firms (not regulated firms). We directly test this prediction in the robustness checks.
[24] More information about the link between Dealscan and Compustat can be found in Chava and Roberts (2008).

We then further screen the data using the following criteria: (1) omit missing observations on the all-in-drawn loan spreads; (2) omit missing observations on financial data items needed in the regressions; (3) retain only loans with the base rate "LIBOR".

After this screening, we construct three sets of samples over one-year, three-year, and five-year period surrounding the event year (2000). To be included in the one-year/three-year/five-year sample, we require that a firm must have issued loan(s) in sample year(s) both before and after the event year. Our final one-year sample contains 1,610 loan facilities, while the three-year and five-year sample contain 8,448 and 14,131 loan facilities, respectively.[25]

3.2 Construction of Lending Relationship Intensity Measures

Following Bharath *et al*. (2011), we construct two continuous relationship strength variables. The first variable is *REL(Num)$_{il}$* calculated for each loan *l* issued by firm *i*. Each syndicated loan has at least one lead bank or, in many cases, multiple lead banks. For each lead bank *b* lent to firm *i*, we calculate the following to capture the lender's relationship strength:

$$REL(Number)_b = \frac{Number\ of\ Loans\ by\ Bank\ b\ to\ Firm\ i\ in\ the\ Last\ 5\ Years}{Total\ Number\ of\ Loans\ Issued\ by\ Firm\ i\ in\ the\ Last\ 5\ Years}$$

For each loan *l*, we calculate the above relationship strength for all the lead syndicated lenders involved and the highest value of *REL(Number)* across all lead banks is assigned to loan *l*.

The second variable is *REL(Amount)$_{il}$* for loan *l* issued by firm *i*[26]. Similarly, for each bank *b* lent to firm *i*, we calculate the following:

$$REL(Amount)_b = \frac{Amount\ of\ Loans\ by\ Bank\ b\ to\ Firm\ i\ in\ the\ Last\ 5\ Years}{Total\ Amount\ of\ Loans\ Issued\ by\ Firm\ i\ in\ the\ Last\ 5\ Years}$$

Again, the highest value obtained across all the lead banks is assigned to loan *l*.

---

[25] Number of observations varies in the reported tables depending on the specification of the regression equations.
[26] We only report the regression results obtained using *REL(Num)$_{il}$* as banking relationship intensity measure. Using *REL(Amount)$_{il}$* yields statistically identical results. These results can be provided upon request.

In addition to the above two measures, another variable of interest, Switch $_{il,}$ is assigned to loan l issued by firm i and takes the value of one if none of the lead lenders in a loan syndicate has lent to firm i in the last 5 years, and zero otherwise.[27] Finally, we also construct the *Number of Relationship Lenders$_{il}$* variable for each loan l issued by firm i through counting the total number of relationship lead lenders involved in the loan l.

It is worth noting that, when constructing the relationship intensity measures, we take into account of the potential impact of bank mergers on banking relationship and recognize the potential inheritance of borrowing-lending relationship from the acquired bank to acquiring bank.[28] As argued in Bharath *et al.* (2011) and Schenone (2010), the information that a bank has regarding his client is likely to be transferred to the merged entity after a bank merger.

3.3 Methodology

We first conduct univariate analysis on the one-year sample to show the unconditional results on how cost of debt and relationship banking intensity as well as other loan/firm characteristics evolve from pre- to post- Reg FD period.

To test our main hypothesis, we run the panel regressions with firm and year fixed effects on all the three sets of samples (*i.e.*, one-year, two-year, and three-year sample) that include both pre- and post- Reg FD loans. To control for the switch of regulation regime, we use a categorical variable "*after*" that equals to one if the loan was issued after Reg FD and 0 otherwise.

To test Hypothesis 1, we employ a standard difference in differences analysis approach and run loan spread regressions. We utilize the following specification in our loan spread regressions:

---

[27] Our *Switch* dummy is a reversal of "relationship dummy" defined in Bharath *et al*. (2011).
[28] Our bank merge data are collected from SDC database.

$$Spread_{i.l} = \beta_0 + \beta_{after}\,after_{i,l} + \beta_{switch_{i,l}}Switch_{i,l} + \beta_{switch\_after}Switch_{i,l} * after_{i,l}$$
$$+ \beta_{firm\_characteri stics}\ Firm\ Chara\ cteristics_{i,l} + \beta_{loan\_characteri stics}\ Loan\ Chara\ cteristics_{i,l}$$
$$+ \beta_{year\_effects}\ Year\ Fixed\ Effects_{i,l} + \beta_{firm\_effects}\ Firm\ Fixed\ Effects_{i,l} + \varepsilon_i + \mu_{i,l}$$

The dependant variable is the initial loan spread measured by all-in-drawn loan spread in basis points. The main variable of concern is the interaction term *Switch*after*. The coefficient estimate on this interaction term captures the average increment/decrement in the loan spread when borrowers switch to new (non-relationship) lenders from pre- to post- Reg FD period. We expect that the estimated coefficient on the interaction term to be significant and positive if our hypothesis 1 holds, indicating that switching to new lenders becomes more costly after Reg FD.

To test our Hypothesis 2, we run relationship banking intensity regressions in two steps. In the first step, we remove the time trend in relationship banking intensity by regressing relationship banking intensity measure ((*Rel(Num)* or *Rel(Amount)*)) on time *t*. We define *t* equals to 1 in year 1994, and 2,3,4...,13 in year 1995, 1997,….,2006, respectively. Then we compute the residual from the regressions. In the second step, we utilize the following specification regressing the residual of *Rel(Num)* or *Rel(Amount)* on explanatory variables :

$$Residual\ (\mathrm{Re}\,l(Num)_{i.l}\ or\ \mathrm{Re}\,l(Amount)_{i.l}) = \beta_0 + \beta_{after}\,after_{i,l}$$
$$+ \beta_{firm\_characteri stics}\ Firm\ Chara\ cteristics_{i,l} + \beta_{loan\_characteri stics}\ Loan\ Chara\ cteristics_{i,l}$$
$$+ \beta_{year\_effects}\ Year\ Fixed\ Effects_{i,l} + \beta_{firm\_effects}\ Firm\ Fixed\ Effects_{i,l} + \varepsilon_i + \mu_{i,l}$$

The dependant variable is one of the banking intensity measures (*Rel(Num)* or *Rel(Amount)*) defined in last section. The main variable of concern is the dummy variable *after*. The coefficient estimate on "*after*" captures the average increase/decrease in relationship banking intensity when borrowers issue loans after Reg FD. We expect that the estimated coefficient on "*after*" to be significant and positive if our hypothesis 2 holds, indicating that the reliance of borrowers on relationship lenders becomes stronger after Reg FD.

To test our Hypothesis 3, we run lead lenders share regressions and utilize the following specification:

$$Lead\ Lenders\ Share_{i,l} = \beta_0 + \beta_{after}\ after_{i,l}$$
$$+ \beta_{firm\_characteristics}\ Firm\ Characteristics_{i,l} + \beta_{loan\_characteristics}\ Loan\ Characteristics_{i,l}$$
$$+ \beta_{year\_effects}\ Year\ Fixed\ Effects_{i,l} + \beta_{firm\_effects}\ Firm\ Fixed\ Effects_{i,l} + \varepsilon_i + \mu_{i,l}$$

The dependant variable is the loan share (in percentage) held by lead lenders in a loan syndicate. The main variable of interest is the dummy variable "*after*". The coefficient estimate on "*after*" captures the average increase/decrease in loan shares held by lead lenders in loan syndications when borrowers issue loans after Reg FD. We expect that the estimated coefficient on "*after*" to be significant and positive if our hypothesis 3 holds, indicating that the lead lenders take greater portion of loans to address the problems due to the increased level of information asymmetry among syndicate members after Reg FD.

Lastly, to test Hypothesis 4, we conduct univariate analysis to examine how the average of bid-ask spread of loans traded on the secondary loan market changes from one month before the event month (October of 2000) to one month after the event month.[29] We expect the average bid-ask spread to increase after Reg FD, indicating that the level of information asymmetry between secondary loan market buyers and sellers increases. In addition, as private firms are not regulated by SEC and not affected by Reg FD, we conduct separate analysis for public firms and private firms to make sure the significant increase in bid-ask spread is not a general market trend that applies to both groups of firms. We verify our univariate analysis results using a difference in differences analysis framework with the following regression specification:

$$Bid - Ask\ Spread = \alpha + \beta * after + \gamma * public + \varphi * after * public + \epsilon$$

---

[29] To avoid the problem of large sample bias in the mean differences analysis, we first take the average of bid-ask spread for each loan facility included in our sample in pre- and post Reg FD period respectively before conducting the mean difference analysis. To be included in the sample, we require that a loan has to be continuously traded in both pre- and post- Reg FD periods.

Where "*public*" is an indicator taking the value of one if a firm is a public firm, or zero otherwise. We expect that coefficient estimate on the interaction term "*after* * *public*" is positive and significant, meaning that comparing to the bid-ask spread for loans issued by private firms, the bid-ask spread for loans issued by public firms significantly increases after Reg FD.

4. Empirical Analysis

4.1 Univariate Results

Table 1 presents the comparison of main variables in the pre- and post- Reg FD years. First, we notice that the average all-in-drawn spread increased from 146.89 basis points in the pre- Reg FD period to 163.46 basis points in the post- Reg FD period. The significant increase in the loan spread may reflect the increased borrowing costs as a consequence of economic recession during this period.[30] The variable "*Switch*" indicates whether the borrower has borrowed loans from a new lender. Table 1 shows that the percentage of loans that involved a new lender has decreased from 39% in the pre- Reg FD to 24% in the post Reg FD period and the decrease is significant with a t-statistics = -7.04, suggesting the probability of switching lender is less likely after the implementation of Reg FD.

As discussed in the last section, we construct three measures to reflect the intensity of relationship banking. The first relationship lending measure, *Rel (Number)* represents the number of loans borrowed from the same relationship lead lender in the last 5 years in relative to the total number of loans issued by the firm in the last 5 years. This measure of relationship intensity has increased in the post- Reg FD period from 0.42 to 0.54 (*t –statistics of difference = 6.17*), suggesting the borrowing in the post Reg FD period involves a greater number of relationship lenders. The second measure *Rel(amount)* reflects the total amount of loans borrowed from the

---

[30] Note that we construct a constant sample in which all our sample firms borrowed money at least once in both the pre- and post-Reg FD periods and therefore any change in the loan characteristics between the pre- and post-Reg FD periods probably will not be due to the change in the composition of the firms.

same relationship lead lender in the last 5 years in relative to the total amount of loans issued by the firm in the last 5 years. There is also a significant increase in this measure of relationship intensity: the percentage of borrowing from relationship lenders increased from 45% to 57%. Consistently, the presence of relationship lenders (*Number of Relationship Lenders*) in a syndicate also increases from 1.79 to 2.34 on average. The significance increase in the relationship intensity and the number of relationship lenders in the syndicated loan surrounding the adoption of Reg FD suggests that borrowers are more likely to seek for lenders from which they have borrowed money before and/or participating lenders are more likely to rely on relationship lenders in syndication.

Table 1 also shows that the percentage of shares held by lead lenders (*Lead Lender Share*) increases about 5% from 59.94% to 64.20%. Sufi (2007) suggests that in the syndicated loan market, if there is high information asymmetry between lead lenders and participating lenders, lead lenders are likely to hold a greater percentage of shares to signal lead lenders' commitment to monitoring. The increase in *Lead Lender Share* after Reg FD suggests that the information asymmetry among lead lenders and participating lenders may have increased after the adoption of the Reg FD.

Table 1 also provides comparisons of a number of firm and loan characteristics before and after Reg FD. We find that market-to-book ratio dropped from 1.77 to 1.65. These finding might reflect the shrink of the equity market after the burst of internet bubble in 2000 and the 9.11 event in 2001. In addition, we find that, the number of analyst forecasts has increased from 2.66 to 4.63 for our sample firms in the post- Reg FD period. At the same time, we find that more firms are rated in the post- Reg FD period, probability due to the increased debt issuing activities by these firms. The leverage ratio and firm profitability do not change significantly. In

terms of loan characteristics, we find that firms are able to borrow more money from each loan deals, the logarithm of loan size increased from 19.05 to 19.21, but the loan maturity has decreased. Although there is a slight decrease in collateral requirement in borrowing in the post-Reg FD period, the decrease is not significant.

4.2 Multivariate Results

4.2.1. Test of H1: Cost of Debt

In H1, we predict that due to the reduced information quantity and quality and higher disclosure risk in the post- Reg FD period, a new lender (non-relationship lender) face higher information production costs than relationship lenders and therefore borrowers incur higher costs of borrowing if they switch to a new lender after Reg FD.

To test this hypothesis, we regress all-in-drawn spread on an indicator variable "*after*" indicating whether the year is in the post Reg FD year, "*switch*" indicating whether the borrower has switched to a new lender. The variable of interest is "*switch*after*", indicating whether the borrowing firms switch lenders in the post Reg-FD period. We predict a positive and significant coefficient on "*switch*after*". We present the testing results in Table 2. Column (1), (2), and (3) report results for the samples using 1-year, 3-year, and 5-years as the event windows, respectively. The coefficient on the interaction term *switch*after* is positive and significant for the 1 year, 3 year, and 5 year samples. For example, in the 1-year sample, if a borrower switches to a new lender, the cost of borrowing increased 31 basis points (*standard error = 16.379*), representing $465,000 additional annual interest payment for borrowing a typical/median size loan in our sample. We also find that switching firms have higher costs of borrowing in the 3-year and 5-year sample, although the increase is smaller in magnitude in these years. The coefficient on *after* is positive and significant, suggesting that there is an increase in the costs of borrowing in the years after 2000.

The sign on other variables is consistent with what has been documented in the prior literature (Saunders, 1996; Berger and Udell, 1993; Dennis, Nandy and Sharpe, 2000; Barath *et al.*, 2009). For example, in the 1-year sample, we find that borrowers that are required to post collateral (*secured*) are paying higher spreads (*coefficient = 54.46, standard error = 12.918*). Credit Revolvers (*revolver*) are associated with significantly lower interest rate *(coefficient = - 33.08, standard error = 7.004*) compared with term loans. In terms of firm characteristics, consistent with other empirical findings in the literature, we find that large firms (*lsale*) are granted loans with lower cost of debt, although the coefficient on *lsale* is not significant in the 1-year sample. While leverage ratio is associated with higher cost of debt (*coefficient = 24.97, standard error = 13.254* in the 3-year sample; *coefficient = 31.36, standard error = 9.842* in the 5-year sample), market to book ratio and profitability ratio tend to reduce the cost of debt. Moreover, a greater number of analyst forecasts tend to be associated with lower cost of debt, implying that a greater amount of information flow in the market helps mitigate t borrowing cost. Lastly, if a loan involves more lead lenders and has concentrated dispersed syndication structure, a lower interested rate will be charged as lead lenders are able to better share lending risk (*coefficient = -5.90, standard error = 2.134* in the 3-year sample; *coefficient = - 6.72*; *standard error = 1.550 in the* 5-year sample).

4.2.2. Test of H2:Relationship Banking Intensity

In H2, we posit that the Reg FD might have increased the disclosure risk for borrowers and therefore they are more likely to rely on relationship lenders who have generated superior proprietary information about the borrowers through past lendings. We test this hypothesis by examining whether there is an increase in the relationship borrowing in the years after Reg FD. Similar to our analysis in testing H1, we construct three samples with 1 year (column 1), 3 year (column 2), and 5 years (column 3) before and after 2000 (the year of Reg FD took effect) as the

pre- Reg FD and post Reg FD years, respectively. We report results using two alternative

relationship measures, *Rel(num)*, indicating the number or relationship borrowing, and

Rel(amount), indicating the amount of loans borrowed from relationship lenders. In our model,

we include loan size, leverage (*levg*), non-investment grade indicator variable

(*noninvestmentgrade*), not rated indicator variable (*notrated*), firm size (*lsale*), market to book

ratio (*mkbk*), and profitability (*prof*). Firms that have borrowed many times have higher tendency

or greater opportunities to establish a relationship with a lender and therefore we control for this

determinant of relationship intensity by including the number of times the borrowers have

borrowed money (*noofborrow*) in the model. We also control for loan purposes, firm fixed

effects, and year fixed effect (except sample 1) in the regression. We find that the relationship

intensity increases significantly in the year after 2000 for the 1-year and 5-year samples.

Specifically, the increase in the intensity is about 12% for the 1-year sample using both measures

and significant at 5%; in the 5-year sample, the increase is about 9% and 7% for the two

measures and significant at 1% and 5%, respectively. The increase in the relationship intensity in

the 3-year sample is positive but not significant.

The coefficients on some variables are consistent with the finding in a recent paper by

Gopalan, Udell, and Yerramilli (2011) who examine how relationship lending evolves with

firms' life cycle. For example, both their study and our study find that when firms have higher

market-to-book ratio and borrow a larger amount of loans, they rely less on relationship

lenders.[31]

---

[31] Gopalan *et al*, (2011) use a dummy variable "*new_relationship*" as the dependent variable, which is the opposite of the relationship intensity we use in this paper. In other word, the firms with lower relationship intensity are firms that are forming new relationship.

4.2.3. Test of H3: Lead Lender Share

In H3, we posit that the reduction in information availability will increase information asymmetry between syndication participants, causing lead lenders to hold a greater percentage of shares in the post- Reg FD years. In this test, we analyze whether lead lenders have to hold a significant a greater percentage of shares in the year after Reg FD compared to the year before Reg FD. We report the test results in Table 4. Overall, the results are consistent with our predictions. For example, the lead lender share increased 13.34 percentage in 2001 compared to that in 1999 and this increase is significant at 5%. When the sample period is extended to 3 or 5 years for pre- and post- periods, the results still hold. For example, in the 3-year sample, the coefficient on *after* is 5.80 (*standard error = 3.134*) and in the 10-year sample, coefficient on *after* is 5.78 (*standard error = 2.464*). The magnitude is smaller in the 3-year and 5 -year samples, which suggests that the instant response of the credit market to Reg FD is stronger in the 1-year sample.

4.2.4. Test of H4: Loan Bid-Ask Spread

To examine the impact of Reg FD on the loan trading, we analyze the change in bid-ask spread of the loans traded on the secondary loan market. In order to track the change in bid-ask spread in months surrounding the event month of October, 2000, we obtain the daily quotation of bid-ask spread from September, 1999 to November 2001 and track the monthly change in bid-ask spread for every month between October, 1999 and October, 2001. We first calculate the monthly average bid-ask spread for each loan facility traded on the secondary loan market; we then calculate the change in bid-ask spread as the mean difference in average bid-ask spreads of each facility in the month after the event month and those traded before the event month. To ensure that results are not driven by the change in the composition of loans traded, we construct a constant sample by requiring facilities to be traded in both the pre- and post-event period. For

example, when October 1999 is considered as an event month, the change in bid-ask spread is calculated by comparing the average bid-ask spreads of the facilities traded in November 1999 and those of the same facilities traded in September 1999. We also use loans borrowed by private firms as a control group because private firms are not subject to Reg FD and we expect not to observe change in bid-ask spread surrounding the event month.

We report the results in Table 5. Panel A presents the univariate analysis of the change in loan spread from October 1999 to October 2001. For the loans issued by public firms, the change in bid-ask spread is only significant in the months surrounding October (the issuance month of Reg FD). Specifically, from the month (September, 2000) before Reg FD is issued to the month (November 2000) after Reg FD is issued, bid-ask spread increased 27.6 basis points and this increase is significant at 1%. In the month after Reg FD (November, 2000) was issued, the bid-ask spread still experiences an increase but at a smaller magnitude and significance level (*change in bid-ask spread = 17.5 basis points, t = 1.75*). The loan trading also saw another significant increase in the bid-ask spread in September, 2011, the month witnessed the 9.11 tragedy. The time-series analysis of the change in bid-ask spread suggests that Reg FD has significantly increased information asymmetry between loan buyers and loan sellers on the secondary market, leading to higher bid-ask spread in the months after the announcement of Reg FD.

Now turn to the change in bid-ask spread for traded loans issued by private firms. These private firms are not subject to Reg FD and we expect that the information flow will not be affected by the enation of Reg FD. Consistent with our expectation, we found that there is no significant change in the bid-ask spread from September to November (*change in bid-ask spread = 0.201, t = 1.224*). Interestingly, we observe that 9.11 caused a similar jump in bid-ask spread (*change in bid-ask spread = 0.370, t = 2.036*) in traded loans issued by private firms. The

evidence that there is a significant increase in bid ask spread in loans issued by public firms but not in loans issued by private firms surrounding the implementation of Reg FD assured us the sudden jump in bid-ask spread for loans issued by public firms is due to the implementation of Reg FD but not due to other confounding events.

In Panel B, we include both private and public firms in the sample and test whether the change in bid-ask spread is more significant for public firms from the pre- to the post- Reg FD period. The coefficient estimate on the interaction term is positive and significant (*coefficient on after * public = 0.099, t = 2.37*), confirming our findings in Panel A.

4.3 Robustness Checks

Because the year of the implementation is accompanied by other significant economic events, such as, the burst of internet bubble, economic recession which may have affected the information environment of firms. We conduct two sets of robustness tests to rule out possible alternative explanations.

In the first set of robustness tests, we use several hypothetical event years to test whether a similar change in relationship intensity, lead lender share, and switching cost can be found.[32] In the second set of robustness test, we use private firms that are not subject to Reg FD as a control group. The premise of using private firms as a control group is that while the economic condition and the burst of internet bubble are likely to affect both private and public firms, Reg FD is expected to have no impact on the private firms and therefore we expect to see no change in the costs of debt, relationship intensity, and lead lender share.

We report the robustness test results for H1 in Table 6. Panel A contains the results using alternative years as the event years. Particularly, we use 1996, 1997, 1998, 2002, 2003, and 2004, as the hypothetical event years, respectively. We exclude year of 1999, 2000, and 2001 as

---

[32] The hypothetical event time for the bid-ask spread change is already included in the main analysis.

event years because using either one of these years as the event year would contain a true pre-event or true post- event year. We report this analysis for 1-year sample only, although using 3-year or 5-year sample produces similar results. We controlled firm fixed effect in these models. We show that the switching costs do not change for other alternative hypothetical event years and the effect of Reg FD can only be observed for debt issued by public firms rather than debt issued by private firms.

We report the robustness test results for H2 in Table 7 and H3 in Table 8. We find a pattern consistent with the pattern in the robustness test of H1. That is, the coefficient on *after* is only positive and significant when the event year is the true event year. The comparison with private firms also reveals that the lead lender share or relationship bank intensity only increase for debt issued by public firms.

In summary, these robustness tests indicate that the higher costs of borrowing for borrowing from a non-relationship lender, higher relationship intensity, and higher lead lender share in the post- Reg FD period are due to the implementation of Reg FD but not some other events.

4.4 Additional Test: Loan Announcement Effect

In Table 9, we attempt to provide evidence whether after the adoption of Reg FD, the reduced information flow before loan announcement has caused greater loan announcement returns in the post- Reg FD period. We use November 1, 1999 to September 1, 2000 as the pre-Reg FD period and January 1, 2000 to August 31, 2001 as the post- Reg FD period. We find that in the pre-Reg FD period, the announcement returns are not significant for the event window (-3, 3), (-1, 1), and (0,1), centered on the deal active date. However, in the post- RegFD periods, the abnormal announcement returns (adjusted by market model) are 0.99%, 0.67%, and 0.55% for

returns accumulated over (-3, 3), (-1, 1), and (0, 1) centered on the loan announcement date (deal active date). These abnormal returns are all significant at 5% or smaller. The comparison of the announcement returns before and after the implementation of Reg FD also suggests that the market response is stronger in the post- Reg FD period than in the pre- Reg FD period with a mean difference at 0.8%, 0.52%, and 0.49% for returns accumulated over (-3,3), (-1,1), and (0,1), respectively. They are significant at 10%.

To reduce the concern that 9.11 may have a confounding effect on the cost of borrowing, relationship intensity, and information asymmetry, we exclude the loans issued after 9.11 for each tests. The untabulated results show that the main results still hold.

We also use relationship intensity as a measure of relationship banking in the test of the differential effects of relationship banking on the cost of borrowing in the pre- Reg FD and post-Reg FD periods. Unreported results also provide evidence consistent with our test of H1.

5. Conclusion

In this study, we investigate whether Reg FD has implications for the credit market. This topic has been largely ignored in the literature mainly because Reg FD grants an exemption for selective disclosure of private information to creditors. However, we argue that Reg FD still imposes an addition disclosure risk on borrowers because they need to make their selectively-disclosed private information public if such information is leaked to the market. In addition to this extra disclosure risk, Reg FD virtually blocks the potential private information flow from the equity market professionals to the credit market investors through enforcing a strict prohibition on selective disclosure to those professionals. Under this circumstance, we conjecture that borrowers will convey less information to market and become more reliance on relationship lenders in whom they have more confidence.

Our empirical results show that, after Reg FD, it is more costly for borrowers to switch to new lender non-relationship lenders. We take this as evidence that non-relationship lenders have less access to information and therefore need to incur higher costs to produce information. We also show that relationship lender-led loans indeed carry more weight in the primary loan market in the post Reg FD period. In addition, we find that, when syndicating a loan, lead lenders tend to keep a higher percentage of the loan to address increased asymmetric information problems among syndicate members. As another piece of evidence, we show that, the average loan bid-ask spread (a direct measure of the level of information asymmetry) increases from the month before the implementation of Reg FD to the month after the implementation of Reg FD. Overall, our empirical evidence suggests that information flow reduces in the credit market as a result of the adoption of Reg FD.

References

Agrawal. A., and S. Chadha. 2002. Who is afraid of reg. Fd? The Behavior and Performance of Sell-side Analysts Following the SEC's Fair Disclosure Rules. SSRN working paper.

Association for Investment Management and Research (AIMR). FD e – survey Summary. 2001. Website. http://www.aimr. Com/pressroom/01releases/regfdsurveysum.htm.

Berger, A. N., and G. F. Udell. 1995. Relationship Lending and Lines of Credit in Small Firm Finance. *Journal of Business* 68:351–81.

Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan. 2011. Lending Relationship and Loan Contact Terms. *Review of Financial Studies* 24(4): 1141-1203.

Boot, A.W., and A. V. Thakor. 1994. Moral Hazard and Secured Lending in an Infinitely Repeated Credit Market Game. *International Economic Review* 35:899–920.

Boot, A. W. 2000. Relationship Banking: What Do We Know? *Journal of Financial Intermediation* 9:7–25.

Boyd, J. H., and E. C. Prescott. 1986. Financial Intermediary-Coalitions. *Journal of Economic Theory*, 38, 211-232.

Chava, S., and M. R. Roberts. 2008. How Does Financing Impact Investment? The Role of Debt Covenants. *Journal of Finance*, 63(5): 2085-2121.

Chen, R. (2012). Regulation Fair Disclosure and Capital Structure. MIT working paper.

Chen, Li., Y. Ma, P. Malatesta, and Y, Xuan. 2011.Corporate Ownership Structure and Loan Syndicate Structure. AFA 2012 working paper.

Bushee, B; D. Mastumoto, and G. Miller. 2004. Managerial and Investor Responses to Disclosure Regulation: The Case of Reg FD and Conference Calls. *The Accounting Review* 79: 617-43.

Cole, R.A. 2008. The Importance of Relationships to the Availability of Credit. Journal of Banking and Finance, 22, 959-977.

Degryse, H., and S. Ongena. 2005. Distance, Lending Relationships, and Competition. *Journal of Finance* 40:231–66.

Degryse, H., and P. Van Cayseele. 2000. Relationship Lending within a Bank-Based System: Evidence from European Small Business Data. *Journal of Financial Intermediation* 9:90–109.

Dennis, S. A., and D. J. Mullineaux. 2000. Syndicated Loans. *Journal of Financial Intermediation* 9:404–26.

Diamond, D. W., 1984. Financial intermediation and delegated monitoring. *The Review of Economic Studies* 51, 393-414.

Diamond, D. 1991. Monitoring and Reputation, the Choice between Bank Loans and Directly Placed Debt. *Journal of Political Economy* 99:688–721.

Drucker, S., and M. Puri. 2009. On loan sales, loan contracting, and lending relationships. *Review of Financial Studies* 22: 2835-2872.

Duarte, J., X. Han, J. Harford, and L. Young (2008). Information asymmetry, information dissemination and the effect of Regulation FD on the cost of capital. *Journal of Financial Economics* 87, 24 - 44.

Eleswarapu, V. R., R. Thompson, and K. Venkataraman. 2004. The impact of Regulation Fair Disclosure: Trading costs and information asymmetry. *Journal of Financial and Quantitative Analysis* 39, 209 - 225.

Gande, A. and A. Saunders. 2012. Are Banks still Special when there is a Secondary Market for Bank Loans? *Journal of Finance,* Forthcoming

Gintschel, A. and S. Markov. 2004. The effectiveness of Regulation FD. *Journal of Accounting and Economics* 37: 293–314.

Gomes, A., G. Gorton, and L. Madureira. 2007. SEC Regulation Fair Disclosure, information, and the cost of capital. *Journal of Corporate Finance* 13, 300 - 334.

Gopalan, R., G.F., Udell, and V.Yerramilli. 2011. Why Do firms Form New Banking Relationship? *Journal of Financial and Quantitative Analysis* 46: 1-35.

Greenbaum, S., G. Kanatas, and I. Venezia. 1989. Equilibrium Loan Pricing under the Bank-Client Relationship. *Journal of Banking and Finance* 13:221–35.

Heflin, F., K. Subramanyam, and Y. Zhang. 2003. Regulation FD and the financial information environment: Early evidence. *The Accounting Review* 78, 1- 37.

Houston, J., and C. James. 1996. Bank Information Monopolies and the Mix of Private and Public Debt Claims. *Journal of Finance* 51:1863–89.

Ioannidou, V. and S. Ongena, (2010). 'Time for a Change': Loan Conditions and Bank Behavior when Firms Switch Banks, *The Journal of Finance*, 65(5), 1847-1877.

James, C. 1987. Some Evidence on the Uniqueness of Bank Loans. *Journal of Financial Economics* 19:217–35.

Jorion, P., Z. Liu, and C. Shi. 2005. Informational effects of Regulation FD: Evidence from rating agencies. *Journal of Financial Economics* 76, 309 - 330.

Kamstra M.J., G.S. Roberts, and P. Shao. 2012. Loan Resales, Asset Selection and Borrowing Cost. York University and University of Lethbridge working paper.

Leland, H.E. and Pyle, D.H. (1977). Informational asymmetries, financial structure and financial intermediation, *Journal of Finance*, 32(2), pp.371–87.

Petersen, M. A., and R. G. Rajan. 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. *Journal of Finance* 49:3–37.

Ramakrishnan, R. T. S., and A. V. Thakor. 1984. Information reliability and a theory of financial intermediation. *Review of Economic Studies* 51: 415-432.

Santos, J. A.C. and P. Nogro. 2009. Is secondary loan market valuable to borrowers? *Quarterly Review of Economics and Finance* 49:1410-1428.

Schenone, C. 2010. Lending Relationship and Information Rents: Do banks Exploit Their Information Advantages? *Review of Financial Studies*:1149 – 1199.

Securities and Exchange Commission (SEC). 2000. *Selective Disclosure and Insider Trading. Release* Nos. 33 – 7881, 34 – 43154. Washington, DC: SEC.

Securities and Exchange Commission (SEC). 2010. Removal from Regulation FD of the Exemption for Credit Rating Agencies. [Release Nos. 33-9146; 34-63003; IC-29448; File No. S7-23-10] Washington, DC: SEC.

Sharpe, S. 1990. Asymmetric Information, Bank Lending and Implicit Contracts: A Stylized Model of Customer Relationships. *Journal of Finance* 45:1069–87.

Sidhu, B., T. Smith, R. E. Whaley, and R. H. Willis. 2008. Regulation Fair Disclosure and the cost of adverse selection. *Journal of Accounting Research* 46, 697 - 728.

Standard & Poor's. 2011. A Guide to the Loan Market.

Sufi, A. 2007. Information Asymmetry and Financial Arrangements: Evidence from Syndicated Loans. *Journal of Finance* 62:629–68.

Wang, I. Y. (2007). Private earnings guidance and its implications for disclosure regulation. *The Accounting Review* 82, 1299.1332.

Massoud, Nadia, D. Nandy, A. Saunders, and K. Song, 2011, "Do Hedge Funds Trade on Private Information? Evidence from Syndicated Lending and Short-Selling", *Journal of Financial Economics 99:* 477-499.

Ivashina, V and Z. Sun, 2011, "Institutional Stock Trading on Loan Market Information",
    Journal of Financial Economics 100, no. 2 (May 2011): 284-303.

Wittenberg-Moerman, R. 2008. The Role of Information Asymmetry and Financial Reporting
    Quality in Debt Trading: Evidence from the Secondary Loan Market. *Journal of Accounting
    & Economics.* 46: 240-260.

Appendix: Variable Definitions

Variables	Definition
Variables of Interest	
All-in-Drawn Spread	Initial all-in-drawn spread is defined as the basis point coupon spread over LIBOR plus the annual fee and the upfront fee spread, if there is any.
Switch	An indicator variable takes a value of one if none of the lenders in a loan syndicate is relationship lender, or zero otherwise.
Relationship Intensity (Number)	For each lead lender b involved in a loan facility issued by firm i, we calculate the following: $$REL(Number)_b = \frac{Number\ of\ Loans\ by\ Bank\ b\ to\ Firm\ i\ in\ the\ Last\ 5\ Years}{Total\ Number\ of\ Loans\ Issued\ by\ Firm\ i\ in\ the\ Last\ 5\ Years}$$ For each loan facility, we assigned the highest value obtained across all the lead lenders to the variable Relationship Intensity (Number).
Relationship Intensity (Amount)	For each lead lender b involved in a loan facility issued by firm i, we calculate the following: $$REL(Number)_b = \frac{Number\ of\ Loans\ by\ Bank\ b\ to\ Firm\ i\ in\ the\ Last\ 5\ Years}{Total\ Number\ of\ Loans\ Issued\ by\ Firm\ i\ in\ the\ Last\ 5\ Years}$$ For each loan facility, we assigned the highest value obtained across all the lead lenders to the variable Relationship Intensity (Number).
No. of Relationship Lenders	The total number of relationship lenders involved in a loan facility.
Lead lenders Share	Percentage of a loan held by lead lender(s) in a loan syndicate.
After	An indicator variable takes a value of one if a loan facility is issued after Reg FD, or zero otherwise.
Loan Characteristics	
lloansize	Natural logarithm of the loan facility amount in 2006 dollars.
lmat	Natural logarithm of loan maturity in months.
secured	An indicator variable takes a value of one if a loan is secured, and zero otherwise.
missingsecured	An indicator variable takes a value of one if the secured status of a loan is missing, and zero otherwise.
revolver	An indicator variable takes a value of one for revolving credit, and zero for term loans.
nooflead	Natural logarithm of one plus the total number of lead lenders involved in a loan facility.
noofborrows	The number of times a borrower has made loan deals in the past.
Borrower Characteristics	
lsale	Natural logarithm of the borrower's total sales.
levg	The borrower's book value of total debt over book value of total assets.
mkbk	The borrower's market-to-book ratio, calculated as (TA+MKVALF-CEQ)/TA, where TA is the book value of total assets, MKVALF is the market value of the firm at the fiscal year end, and CEQ is the book value of total common equity.
prof	The borrower's profitability ratio calculated as EBITDA/SALES, where EBITDA is earnings before interest, tax, and depreciation & amortization.
Investment grade	An indicator variable takes the value of one if a loan borrower has an S & P long term senior debt rating of "BBB" and above, or zero otherwise.
Not rated	An indicator variable takes the value of one if a loan borrower does not have an S & P long term senior debt rating, or zero otherwise.
analysts	The total number of financial analyst forecasts.

Table 1. Summary Statistics before and after Regulation FD

This table provides summary statistics of all variables used in our multivariate analysis. The sample is constructed by selecting firms that issued at least one loan or more loans in both the pre- and post-Reg FD years (in a one-year window). "*Before*" indicates pre-Reg FD period (year 1999) and "After" indicates post-Reg FD period (year 2001). The definition of these variables can be found in the appendix. We report the comparison of loan/firm characteristics in pre- and post- Reg FD period. The second last column reports the mean difference *t-test* statistics and last column reports the ranksum Z statistics. *, **, and *** indicates significant at 10%, 5% and 1% level respectively.

| variable | Before | | | | After | | | | Tests | |
	mean	median	s.d.	obs.	mean	median	s.d.	obs.	Mean Difference	Rank Sum
Main Variables of Interest										
All-in-Drawn Spread	146.89	115.00	113.61	919	163.46	125.00	131.09	882	[2.87]***	[2.36]**
Switch	0.39	0.00	0.4886	919	0.24	0.00	0.4275	882	[-7.04]***	[-6.94]***
Rel(Num)	0.42	0.33	0.40	919	0.54	0.57	0.38	882	[6.17]***	[5.94]***
Rel(Amount)	0.45	0.45	0.42	919	0.57	0.66	0.39	882	[6.15]***	[5.8]***
Number of Relationship Lenders	1.79	1.00	2.75	919	2.34	1.00	3.07	882	[4.04]***	[6.16]***
Lead Lenders Share	59.94	60.00	26.22	284	64.20	64.86	22.27	255	[2.02]**	[1.87]*
Loan Characteristics										
lloansize	19.046	19.114	1.3727	919	19.206	19.186	1.4061	882	[2.45]**	[2.54]**
lmat	3.3385	3.5835	0.8382	775	3.1503	3.1781	0.8117	845	[-4.59]***	[-4.58]***
secured	0.3493	0	0.477	919	0.3333	0	0.4717	882	[-0.71]	[-0.71]
missingsecured	0.4266	0	0.4948	919	0.4592	0	0.4986	882	[1.39]	[1.39]
revolver	0.6594	1	0.4742	919	0.7404	1	0.4387	882	[3.76]***	[3.74]***
nooflead	1.877	1.9459	1.0719	919	1.9374	2.0794	0.9535	882	[1.26]	[1.03]
noofborrows	3.9924	3	3.2127	919	5.7483	5	3.9003	882	[10.45]***	[12.03]***
Firm Characteristics										
lsale	7.1103	7.2219	1.8001	909	7.627	7.7025	1.6546	882	[6.32]***	[5.87]***
levg	0.2982	0.2816	0.2233	908	0.2989	0.2712	0.2052	882	[0.06]	[0.53]
mkbk	1.7661	1.4507	1.0691	919	1.6508	1.2606	1.1684	882	[-2.19]**	[-5.89]***
prof	0.1954	0.1588	0.1771	919	0.1998	0.1527	0.1702	882	[0.54]	[-0.51]
investment grade	0.3493	0	0.477	919	0.4546	0	0.4982	882	[4.58]***	[4.56]***
notrated	0.4298	0	0.4953	919	0.2562	0	0.4368	882	[-7.88]***	[-7.75]***
analysts	2.6627	0	6.6293	919	4.6281	0	7.3982	882	[5.94]***	[7.54]***

Table 2. The Costs of Switching Lenders before and after Regulation FD

This table reports the test results of H1 examining change in the costs of switching lenders in the pre- and post- Reg FD periods. We control for both year fixed effects and firm fixed effects in these regressions. The dependent variable is all-in-drawn spread in basis points. We report the regression results based on three different sample periods: column (1) , (2), and (3) for the loans issued in [-1 years , 1 year], [-3 years, 3 years], and [-5 years, 5 years] centered around 2000, respectively. To be included in the sample, we require a firm to issue loans in both pre- and post-Reg FD period. All the loans issued in the year 2000 are excluded from the sample. The definition of the variables can be found in the appendix. The main variable of interest is the interaction term "*switch*after*". Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Regression	(1)		(2)		(3)	
Variables	1999-2001		1997-2003		1995-2005	
after	24.48***	[6.814]	25.66***	[4.756]	49.17***	[7.104]
switch	-7.65	[8.172]	-5.08	[3.898]	-2.77	[2.823]
switch*after	*31.14**	*[16.379]*	*10.70**	*[5.895]*	*11.45***	*[4.554]*
lloansize	-4.82	[3.358]	-9.71***	[1.856]	-10.85***	[1.556]
lmat	9.42**	[4.086]	5.36**	[2.245]	3.99**	[1.686]
secured	54.46***	[12.918]	43.42***	[5.078]	47.71***	[3.620]
missingsecured	5.70	[6.616]	-0.10	[3.683]	4.08*	[2.352]
revolver	-33.08***	[7.004]	-39.00***	[2.891]	-42.02***	[2.301]
llender	-0.96	[6.540]	-5.90***	[2.134]	-6.72***	[1.550]
lsale	-4.07	[14.460]	-5.19	[4.709]	-7.92**	[3.272]
levg	-5.41	[34.419]	24.87*	[13.254]	31.36***	[9.842]
mkbk	-19.13***	[5.307]	-8.17***	[2.736]	-7.27***	[2.110]
prof	-56.16	[67.707]	-79.93***	[26.989]	-114.40***	[22.554]
investmentgrade	-22.64	[18.665]	-48.62***	[9.193]	-33.65***	[5.840]
notrated	4.33	[16.031]	-7.81	[6.493]	-2.79	[4.939]
analysts	-0.65	[0.531]	-0.78**	[0.319]	-0.93***	[0.253]
Loan Purposes	Yes		Yes		Yes	
Firm Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	No		Yes		Yes	
Observations	1,609		8,405		14,071	
R-squared	0.86		0.75		0.70	

Table 3. Change in Relationship Banking Intensity before and after Reg FD

This table reports the test results of the effect of Reg FD on the relationship banking intensity (H2). We control for both year fixed effects and firm fixed effects in these regressions. The dependent variable for the regressions is the residaul relationship intensity computed by regressing relationship banking intensity measured by *Rel(Num)* or *Rel(Amount)* on a time trend t (t=1...13 for year 1994 to 2006). We report the regression results based on three different sample periods: column (1) , (2), and (3) for the loans issued in [-1 years , 1 year], [-3 years, 3 years], and [-5 years, 5 years] centered around 2000, respectively. To be included in the sample, we require a firm to issue loans in both pre- and post-Reg FD period. All the loans issued in the year 2000 are excluded from the sample. The definition of the variables can be found in the appendix. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Variables	(1) 1999-2001				(2) 1997-2003				(3) 1995-2005			
	Rel(Num)		*Rel(Amount)*		*Rel(Num)*		*Rel(Amount)*		*Rel(Num)*		*Rel(Amount)*	
after	*0.12***	*[0.056]*	*0.12***	*[0.058]*	*0.04*	*[0.035]*	*0.02*	*[0.036]*	*0.09****	*[0.032]*	*0.07***	*[0.033]*
lloansize	0.02	[0.016]	0.03*	[0.018]	0.03***	[0.007]	0.05***	[0.007]	0.03***	[0.005]	0.04***	[0.005]
levg	0.19	[0.203]	0.22	[0.216]	0.18***	[0.067]	0.19***	[0.071]	0.03	[0.052]	0.04	[0.054]
noninvestmentgrade	-0.13	[0.102]	-0.18*	[0.102]	-0.10***	[0.034]	-0.12***	[0.037]	-0.09***	[0.027]	-0.10***	[0.028]
notrated	-0.25***	[0.092]	-0.27***	[0.096]	-0.10***	[0.039]	-0.12***	[0.040]	-0.10***	[0.029]	-0.10***	[0.030]
lsale	0.02	[0.051]	0.02	[0.054]	-0.02	[0.019]	-0.01	[0.021]	0.00	[0.013]	0.01	[0.014]
mkbk	-0.03	[0.027]	-0.04	[0.028]	0.03***	[0.008]	0.03***	[0.008]	0.01	[0.007]	0.01*	[0.008]
prof	0.15	[0.269]	0.28	[0.287]	-0.03	[0.111]	0.02	[0.114]	0.00	[0.079]	0.01	[0.084]
noofborrow	-0.02	[0.019]	-0.01	[0.020]	0.01	[0.007]	0.01	[0.008]	0.00	[0.005]	0.01	[0.005]
Loan Purposes	Yes		Yes		Yes		Yes		Yes		Yes	
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects	No		No		Yes		Yes		Yes		Yes	
Observations	1,449		1,449		7,370		7,370		12,359		12,359	
R Squared	0.69		0.69		0.54		0.54		0.45		0.46	

Table 4. Change in Lead Lenders Share before and after Reg FD

This table reports results for testing the effect of Reg FD on loan share held by lead banks in loan syndicates (H3). We control for both year fixed effects and firm fixed effects in these regressions. The dependent variable for the regressions is the loan share held by lead banks in a loan syndicate. We report the regression results based on three different sample periods: column (1) , (2), and (3) for the loans issued in [-1 years , 1 year], [-3 years, 3 years], and [-5 years, 5 years] centered around 2000, respectively. To be included in the sample, we require a firm to issue loans in both pre- and post-Reg FD period. All the loans issued in the year 2000 are excluded from the sample. The definition of the variables can be found in the appendix. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Variables	(1) 1999-2001		(2) 1997-2003		(3) 1995-2005	
after	*13.34***	*[6.098]*	*5.80**	*[3.134]*	*5.78***	*[2.464]*
lloansize	-1.69	[2.875]	2.20**	[0.887]	2.18***	[0.720]
lmat	3.08	[2.033]	0.59	[1.052]	-0.40	[0.756]
revolver	-1.91	[4.221]	-0.58	[1.483]	-0.82	[1.066]
levg	31.97	[42.708]	0.26	[9.052]	4.09	[5.644]
lsale	-8.92	[10.451]	0.08	[2.392]	-0.99	[1.437]
mkbk	0.38	[4.700]	-1.38	[1.142]	-0.74	[0.817]
Credit Ratings	Yes		Yes		Yes	
Loan Purposes	Yes		Yes		Yes	
Year Fixed Effects	No		Yes		Yes	
Firm Fixed Effects	Yes		Yes		Yes	
Observations	527		2,571		4,334	
R-squared	0.80		0.65		0.58	

Table 5. Change in Bid-Ask Spread of the Loans Traded on the Secondary Loan Market

Panel A of this table reports univariate analysis results of the change in the bid-ask spread of loans surrounding the hypothetical/true event month. This analysis is conducted for public firm loans and private firm loans respectively. Using the daily quotation of the bid-ask spread, we first calculate the monthly average bid-ask spread for each loan facility traded on the secondary loan market. Change in bid-ask spread refers to mean difference in average bid-ask spreads between facilities traded in the month after the event month and those traded in the month before the event month. To ensure the facilities are comparable before and after the event month, we require facilities to be traded in both pre- and post-event period. For example, when October 1999 is considered as an event month, the changes in bid-ask spread is calculated by comparing the average bid-ask spreads of the facilities traded in November 1999 and those of the same facilities traded in September 1999. Mean difference t-stat is reported in the column next to "Chg. Bid-Ask Spread" column. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively. In Panel B, we report the difference in differences analysis results for public firm loans and private firm loans surrounding the true event month, October 2000. The difference in differences regression equation is as follows:

$$Bid - Ask\ Spread = \alpha + \beta * after + \gamma * public + \varphi * after * public + \epsilon$$

Panel A: Univariate Analysis

Event Month	Public Firms			Private Firms		
	Chg. Bid-Ask Spread	t-Stat	Obs.	Chg. Bid-Ask Spread	t-Stat	Obs.
Oct-99	0.091	0.940	499	0.178	1.395	269
Nov-99	0.078	0.783	509	0.136	1.057	280
Dec-99	-0.025	-0.267	552	0.010	0.080	288
Jan-00	0.038	0.400	563	-0.040	-0.320	306
Feb-00	0.102	1.081	571	0.088	0.707	316
Mar-00	0.139	1.412	589	0.163	1.267	330
Apr-00	0.128	1.280	613	0.097	0.749	341
May-00	0.066	0.649	622	-0.005	-0.038	350
Jun-00	0.041	0.379	628	-0.030	-0.228	358
Jul-00	-0.032	-0.320	657	0.115	0.880	374
Aug-00	-0.053	-0.553	663	0.284**	1.968	366
Sep-00	0.141	1.462	685	0.302*	1.956	363
OCT-00 (Reg FD)	**0.276***	2.801	690	0.201	1.224	370
Nov-00	0.175*	1.700	689	0.148	0.882	360
Dec-00	0.106	1.019	691	0.119	0.700	362
Jan-01	0.079	0.737	697	0.188	1.085	364
Feb-01	0.048	0.454	712	0.227	1.357	371
Mar-01	0.040	0.392	720	0.320*	1.796	373
Apr-01	-0.010	-0.105	755	0.213	1.241	382
May-01	-0.071	-0.730	753	0.043	0.235	387
Jun-01	0.034	0.362	772	0.127	0.697	392
Jul-01	-0.010	-0.107	790	0.031	0.170	397
Aug-01	0.042	0.447	804	0.010	0.055	397
Sep-01 (911)	**0.380***	4.069	819	**0.370***	**2.036**	397
Oct-01	0.191***	2.063	815	0.269	1.558	402

**Panel B: Difference in Differences Analysis**

Event Month	Dependent Variable: Bid-Ask Spread		
	Variables	Coef.	t-stat
Oct-00	after	0.15***	4.15
	public	-0.327***	-11.38
	after*public	0.099**	2.37
	constant	1.674***	67.44
obs.		43,923	
R-squared		0.01	

Table 6. The Costs of Switching Lenders: Switching Event Year & Comparing Public Firms with Private Firms

Panel A examines the change in the costs of switching lenders before and after the event year and reports the fixed effects regression results using both hypothetical event years and actual event year. We control for firm fixed effects in these regressions. The dependent variable is all-in-drawn spread in basis points. We report the regression results for the sample period [-1 years , 1 year] surrounding the event year. To be included in the sample, we require a firm to issue loans in both pre- and post-event period. All the loans issued in the event year are excluded from the sample. Panel B compares the change in the costs of switching lenders of public firms with that of private firms surrounding the true event year 2000. The definition of the variables can be found in the appendix. The main variable of interest is the interaction term "*switch*after*". Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Panel A: Switching Event Year

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Event Year	1996		1997		1998		**2000**		2002		2003		2004	
Period	1995-1997		1996-1998		1997-1999		1999-2001		2001-2003		2002-2004		2003-2005	
after	-3.35	[5.312]	2.21	[7.095]	40.26***	[6.365]	24.48***	[6.814]	21.74***	[6.388]	22.91***	[6.977]	-52.57***	[7.093]
switch	-2.65	[8.645]	-2.92	[8.738]	-12.51	[7.777]	-7.65	[8.172]	-2.36	[10.569]	-8.25	[8.980]	18.59*	[10.047]
*switch*after*	*-14.68*	*[11.549]*	*5.83*	*[11.999]*	*10.33*	*[10.632]*	*31.14**	*[16.379]*	*20.32*	*[14.179]*	*20.24*	*[18.125]*	*1.71*	*[16.271]*
lloansize	-3.97	[3.393]	12.34***	[3.814]	-3.89	[2.761]	-4.82	[3.358]	-8.83**	[3.911]	-7.27	[4.676]	-11.96***	[3.553]
lmat	0.21	[4.385]	-1.33	[4.150]	5.41	[3.750]	9.42**	[4.086]	13.21***	[3.830]	9.88**	[4.134]	10.56**	[4.625]
secured	23.80**	[11.653]	26.34***	[9.787]	23.59***	[8.555]	54.46***	[12.918]	34.53**	[14.240]	20.64*	[11.144]	37.31***	[10.375]
missingsecured	-8.02	[8.032]	13.14*	[7.918]	-1.03	[6.498]	5.70	[6.616]	-2.04	[7.430]	-8.47	[6.789]	14.33**	[6.838]
revolver	-25.83***	[5.152]	-26.20***	[4.277]	-24.36***	[4.041]	-33.08***	[7.004]	-43.15***	[7.226]	-37.95***	[6.951]	-48.65***	[6.304]
llender	-6.36**	[3.184]	-5.23	[3.630]	2.30	[3.162]	-0.96	[6.540]	-5.61	[6.014]	-9.22	[6.256]	-12.76***	[4.888]
lsale	-10.21	[7.310]	-6.57	[5.514]	-3.06	[6.587]	-4.07	[14.460]	-30.87*	[16.997]	-25.67*	[14.506]	25.55	[16.240]
levg	17.54	[28.181]	33.92	[30.972]	28.04	[27.869]	-5.41	[34.419]	43.46	[56.423]	27.36	[32.458]	-57.39	[49.919]
mkbk	-1.91	[6.827]	-8.10**	[3.605]	-12.92**	[5.967]	19.13***	[5.307]	-3.87	[3.091]	-11.97	[7.964]	-17.30*	[10.360]
prof	-21.58	[36.379]	-11.52	[40.038]	-48.10	[55.274]	-56.16	[67.707]	-69.77	[59.428]	-67.70	[77.734]	-214.41***	[68.495]
investmentgrade	-25.31*	[13.853]	6.62	[15.713]	-29.46	[18.274]	-22.64	[18.665]	-69.07***	[21.442]	-20.66	[21.427]	3.01	[23.315]
notrated	-24.69**	[12.288]	17.21	[16.151]	-11.35	[11.575]	4.33	[16.031]	-27.95	[26.384]	-4.59	[17.826]	26.65	[21.172]
analysts	-0.31	[0.491]	0.04	[0.546]	-0.43	[0.798]	-0.65	[0.531]	-0.19	[0.806]	0.03	[0.810]	-0.41	[1.283]
Loan Purposes	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Observations	1,583		1,655		1,806		1,609		2,100		2,447		2,402	
R-squared	0.84		0.82		0.86		0.86		0.82		0.80		0.78	

**Panel B: Comparing Public Firms with Private Firms**

	(1) Public Firms		(2) Private Firms	
Event Year	2000		2000	
Period	1999-2001		1999-2001	
after	18.40***	[6.133]	31.88	[19.877]
switch	-4.65	[8.063]	2.14	[30.298]
switch*after	_31.71*_	_[16.475]_	_-29.61_	_[36.583]_
lloansize	-4.00	[3.007]	-0.11	[6.740]
levloan	87.75***	[14.739]	107.28***	[37.007]
lmat	8.57**	[3.877]	4.61	[7.009]
secured	37.53***	[12.227]	42.42	[26.056]
missingsecured	-0.34	[6.257]	12.92	[17.939]
revolver	-33.67***	[6.747]	-21.79*	[11.938]
llender	-5.18	[6.491]	-7.37	[12.002]
lsale	-5.73	[10.968]	-1.62	[22.110]
Loan Purposes	Yes		Yes	
Firm Fixed Effects	Yes		Yes	
Observations	1,610		270	
R-squared	0.87		0.91	

Table 7. Change in Relationship Banking Intensity: Switching Event Year & Comparing Public Firms with Private Firms

Panel A examines the change in the relationship banking intensity before and after the event year and reports the fixed effects regression results using both hypothetical event years and actual event year. We control for firm fixed effects in these regressions. The dependent variable for the regressions is the relationship intensity residual computed by regressing relationship banking intensity measured by Rel(Num)on a time trend variable t (t=1...13 for year 1994 to 2006). We report the regression results for the sample period [-1 years , 1 year] surrounding the event year. To be included in the sample, we require a firm to issue loans in both pre- and post-event period. All the loans issued in the event year are excluded from the samples. Panel B compares the change in relationship banking intensity of public firms with that of private firms surrounding the true event year 2000. The definition of the variables can be found in the appendix. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Panel A: Switching Event Year

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Event Year	1996		1997		1998		**2000**		2002		2003		2004	
Period	1995-1997		1996-1998		1997-1999		1999-2001		2001-2003		2002-2004		2003-2005	
after	*-0.06*	*[0.045]*	*-0.01*	*[0.040]*	*0.00*	*[0.035]*	*0.12***	*[0.056]*	*-0.02*	*[0.031]*	*0.03*	*[0.025]*	*0.00*	*[0.027]*
lloansize	0.06***	[0.014]	0.01	[0.017]	0.03**	[0.014]	0.02	[0.016]	0.05***	[0.013]	0.01	[0.014]	0.03***	[0.011]
levg	0.16	[0.160]	-0.04	[0.155]	0.04	[0.114]	0.19	[0.203]	0.12	[0.198]	-0.06	[0.175]	0.01	[0.172]
noninvestmentgrade	-0.11	[0.121]	0.13	[0.091]	-0.06	[0.108]	-0.13	[0.102]	-0.14*	[0.075]	0.08	[0.079]	0.04	[0.088]
notrated	-0.13	[0.106]	0.08	[0.098]	0.02	[0.112]	-0.25***	[0.092]	-0.18**	[0.088]	-0.01	[0.089]	0.01	[0.094]
lsale	0.01	[0.060]	0.04	[0.030]	0.01	[0.040]	0.02	[0.051]	0.08	[0.056]	0.02	[0.063]	0.08	[0.051]
mkbk	-0.02	[0.046]	0.03	[0.040]	0.04	[0.032]	-0.03	[0.027]	0.02	[0.016]	-0.02	[0.038]	0.04	[0.039]
prof	0.41	[0.307]	0.41**	[0.171]	0.07	[0.233]	0.15	[0.269]	-0.05	[0.307]	0.40	[0.247]	-0.39	[0.291]
noofborrow	0.01	[0.016]	0.03***	[0.010]	0.01	[0.012]	-0.02	[0.019]	0.03***	[0.009]	0.03***	[0.008]	0.02***	[0.006]
Loan Purposes	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Firm Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Observations	1,687		1,799		2,033		1,449		2,149		2,502		2,434	
R Squared	0.60		0.60		0.62		0.69		0.61		0.63		0.64	

47

Panel B: Comparing Public Firms with Private Firms

	(1) Public Firms		(2) Private Firms	
Event Year	2000		2000	
Period	1999-2001		1999-2001	
after	*0.14**	*[0.058]*	*0.16*	*[0.130]*
lloansize	0.02	[0.016]	-0.01	[0.033]
levloan	0.02	[0.076]	0.07	[0.149]
lsale	0.05	[0.040]	-0.02	[0.072]
noofborrow	-0.02	[0.020]	0.02	[0.049]
Loan Purposes	Yes		Yes	
Firm Fixed Effects	Yes		Yes	
Observations	1,449		316	
R Squared	0.68		0.74	

Table 8. Change in Lead Lenders Share: Switching Event Year & Comparing Public Firms with Private Firms

Panel A examines the change in the loan share held by lead banks in loan syndicates before and after the event year and reports the fixed effect regression results using both hypothetical event years and actual event year. We control for firm fixed effects in these regressions. The dependent variable is loan share (in percentage) held by lead banks in a loan syndicate. We report the regression results for the sample period [-1 years , 1 year] surrounding the event year. To be included in the sample, we require a firm to issue loans in both pre- and post-event period. All the loans issued in the event year are excluded from the sample. Panel B compares the change in lead lender share of public firms with that of private firms surrounding the true event year 2000. The definition of the variables can be found in the appendix. Superscripts ***, **, * correspond to statistical significance at the 1%, 5%, and 10% levels with standard error clustered at firm level, respectively.

Panel A: Switching Event Year

	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
Event Year	1996		1997		1998		**2000**		2002		2003		2004	
Period	1995-1997		1996-1998		1997-1999		1999-2001		2001-2003		2002-2004		2003-2005	
after	*10.73**	*[5.581]*	*4.24*	*[4.869]*	*3.36*	*[5.459]*	*13.34***	*[6.098]*	*0.64*	*[3.893]*	*-1.12*	*[3.352]*	*-2.91*	*[4.774]*
lloansize	-6.39**	[2.741]	-3.86*	[2.246]	-2.02	[1.899]	-1.69	[2.875]	3.49	[2.310]	-0.01	[2.376]	-1.91	[2.308]
lmat	-2.15	[2.911]	-3.27	[2.126]	-5.70**	[2.318]	3.08	[2.033]	-0.31	[1.704]	0.69	[2.144]	-1.58	[2.245]
revolver	-3.49	[4.045]	-3.54	[2.873]	-3.38	[3.496]	-1.91	[4.221]	-10.28***	[3.523]	-0.65	[3.320]	-5.15*	[2.914]
levg	-3.52	[30.044]	-24.95	[20.322]	23.48	[17.526]	31.97	[42.708]	-5.55	[26.583]	42.76	[27.678]	-22.68	[28.393]
lsale	-1.91	[8.141]	0.19	[4.218]	12.58	[12.172]	-8.92	[10.451]	-8.92	[8.763]	-2.25	[6.389]	3.91	[10.975]
mkbk	-7.54	[6.657]	-0.32	[2.129]	5.55	[7.175]	0.38	[4.700]	-2.07	[1.616]	4.10**	[1.872]	-0.28	[6.808]
Credit Ratings	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Loan Purposes	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Firm Fixed Effectes	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Observations	699		717		664		527		749		798		841	
R-squared	0.78		0.81		0.81		0.80		0.78		0.79		0.76	

**Panel B: Comparing Public Firms with Private Firms**

	(1) Public Firms		(2) Private Firms	
Event Year	2000		2000	
Period	1999-2001		1999-2001	
after	*11.15**	*[6.109]*	*16.29*	*[13.636]*
lloansize	-1.57	[2.836]	0.13	[4.304]
levloan	6.79	[12.001]	-5.42	[15.602]
lmat	3.14	[2.220]	3.31	[3.717]
revolver	-1.10	[4.397]	-10.21	[15.526]
lsale	-5.99	[10.659]	-29.29*	[15.803]
Loan Purposes	Yes		Yes	
Firm Fixed Effectes	Yes		Yes	
Observations	527		49	
R-squared	0.79		0.92	

Table 9. Average Cumulative Abnormal Returns to Loan Issue Announcement Before and After Reg FD

This table presents the average cumulative abnormal return (ACAR) to borrowers who make a loan issue announcement before and after Reg FD. We use the deal active date as a proxy for the loan announcement date. The sample period is from Nov 1, 1999 to August 31, 2001. We exclude all the loans issued during the month of October, November, and December of 2000. Results for pre- and post-Reg FD period are reported in column (1) and (2), respectively. In column (3), the difference in mean between pre-and post-Reg FD period and student *t* statistics are reported. The student *t* statistics for testing ACAR=0 in the event window are reported for pre- and post-event period, respectively. The superscripts for t statistics ***, **, and * stand for significance at the 1%, 5%, and 10% levels using a two-tailed test.

	(1)			(2)			(3)	
	Before Reg FD (A)			After Reg FD (B)			Mean Difference (B-A)	
	ACAR			ACAR				
Event Window	(%)	t-stat	obs.	(%)	t-stat	obs.	Difference in Mean	*t-Stat*
[-3,+3]	0.19	[0.66]	1503	0.99	[2.54]**	858	0.80	[1.66]*
[-1,1]	0.15	[0.87]	1503	0.67	[2.75]***	858	0.52	[1.73]*
[0,+1]	0.06	[0.38]	1503	0.55	[2.62]***	858	0.49	[1.88]*