



Master thesis

*Debt holders' monitoring and accounting conservatism: Evidence from
geographic distance between lenders and borrowers*

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Abstract

This thesis examines the effect of distance between the debt-holder and the corporate borrower on conservative reporting of the borrower. The sample includes debt-holders and lenders from bank loans on the U.S debt market in the period of 2010 to 2013. This thesis computes the distance according to the longitude and the latitude of the location and employs C_Score from KW model (2009) to measure accounting conservatism. The main findings of this thesis imply that when the distance between the bank lender and the corporate borrower is larger, the accounting conservatism of the borrower is more significant. Moreover, the findings also imply that the lender uses the monitoring ability to control the borrower, which is in accordance with previous studies. This thesis also leads to a discussion on the location of the borrower and the bank, concluding the change and feature at the same time. In general, this thesis provides insight by investigating from the perspective of geographic distance and is complementary to existing debt contracting theory.

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1. Introduction

Accounting conservatism is one of the most influential principles of valuation in practice and has a history of more than five hundred years. One classic definition of conservatism is “the accountants’ tendency to require a higher degree of verification to recognise good news as gains than to recognise bad news as losses” (Basu 1997). In short, the basic understanding of conservatism is the differential verification requirement.

Recent empirical research has provided alternative explanations for conservatism, one of which is contracting (Watts 2003). In contracting, different parties have the incentive to pursue the maximum interest, and the information asymmetry intensifies the interest contradiction among them, resulting in agency cost and agency problem. Watts (2003) also points out in this influential paper that such issue is particularly crucial in debt contracts.

Compared to other stakeholders, debt-holders have an asymmetric payoff, which mainly results from limited liability and potential risk of debt contracts. As a consequence, they seek for assurances of borrowers’ solvency before and during issuing the loan, to avoid possible impairment on their interest. One efficient mechanism to add on verification as well as reducing the risk is conservatism, referring to lower bound measures of net asset value. Compared to set restrictions in debt covenants, acquiring the most conservative information of borrower is less at lender’s expense and takes fewer effort. Ahmed et al. (2002) find evidence that conservatism lowers debt cost of capital and eases conflict between debt-holder and shareholder.

To achieve the goal of risk-reducing and cost-saving, debt-holders employ the monitoring method, which varies in practice. One physical factor that impact monitoring is geographic distance. Monitoring rests on the premise that comprehensive information is available and depends on its sufficiency. Previous research shows distance impairs the ability of lenders to acquire borrower-specific information (Almazan [2002]). While the association exists in terms of theory, there has yet to be an empirical study directly examining the influence of lender-borrower distance on borrower’s conservatism.

This thesis aims to fill the void and add on existing contracting debt theory as the complement. In general, the analysis argues that, when distance between lenders and borrowers is large, lenders require a high level of accounting conservatism in borrowers to mitigate the

risk. The goal is to investigate whether monitoring plays a role in influencing conservatism from a geographical perspective.

Following related research, the main focus of this thesis is conditional conservatism, which can be reasonably explained by debt contracting. The thesis limits lenders to banks in U.S considering the information availability. To capture the accounting conservatism, the thesis employs C_Score as measurement from Khan and Watts (2009). With respect to distance, locations between head offices of bank lenders and corporate borrowers are taken into consideration. While this measure is frequently used in studies, it also has a drawback: the dependency on the assumption that all debt contracting decisions are made within head offices ultimately.

This thesis retrieves lending information from DealScan, and select the sample based on loan characteristics such as the type and amount of loan contracts. According to details in sample, I collect borrower-specific information through Center for Research in Security Price (CRSP) and Compustat then perform the same computation of variables as in Khan and Watts (2009). Following common practice, the definition of locations is set as the site of head office for both bank lenders and corporate borrowers. The detailed location used in distance measurement comes from multiple sources, including data set from the website of Federal Deposit Insurance Corporation (<https://www5.fdic.gov/idasp/advSearchLanding.asp>) together with official websites of banks, and address details on Compustat of borrower companies. To measure the distance, the thesis employs a two-step method: firstly, all locations in words are transferred to data sets of longitudes and latitudes in number, and there is one unique numerical compound per address. Secondly, by using the formula which computes distance based on longitudes and latitudes of starting point and ending point in excel, distance for each loan is obtained. The distance-calculating formula is enclosed in Appendix.

Consistent with theoretical analysis and prediction, I find that accounting conservatism in corporate borrower is positively related to the distance between the lender and the borrower after controlling several firm-specific characteristics. The empirical analysis uses two-way fixed effect (fixed individual and time effect) model and it is robust to tests on unbalanced short panel data.

The main contribution of the thesis is to provide evidence of how lender's monitoring

ability affect borrower's conservatism, with a focus on geographic distance. While there has been extensive research studying the mechanism in accounting conservatism and the role of debt-holder's monitoring ability in it, few understands the association comprehensively with sufficient empirical evidence, let alone from a physical perspective. This thesis examines the effect of geographic distance and is complementary to theories on both sides of borrower and lender.

This thesis is closely related to debt contracting theory when stands on the side of borrower, at the same time to the effect of soft information in bank's lending decision. The result is consistent with papers which examine the association between information and distance, such as Brevoort and Wolken (2008), Agarwal and Hauswald (2007, 2010) and Wang (2012). The analysis also supports the argument in Watts (2003a) that information impacts monitoring and thereby has influence on conservatism. However, few of previous studies has made a direct connection among these factors.

The usefulness of this thesis reflects on its practical implications for multiple parties in the debt market. For bank lender, it improves the rationality of lending decisions with the understanding of soft information and provides alternative as monitoring method. For borrower, it coordinates the financing strategy with its reporting principle while supplying suggestion to optimise its operation. For regulator, it helps to gain a comprehensive view and achieve the goal of guidance effectively. Overall, it ensures the growth of the market as a whole and promotes performance in all aspects.

The reminder of the thesis is organised as follows. Section 2 concludes theoretical background based on literature review and contributions. Section 3 presents the development of main hypothesis. In section 4, the research design is described in detail. Section 5 provides the data and section 6 reports the results along with figures and tables. Section 7 simplified concludes the whole thesis. Appendix and reference are enclosed at the end.

2. Theoretical background and main contribution

2.1. Theoretical background

Accounting conservatism, which remains a fundamental recognition principle in practice, has been developing as one of the critical accounting theories during the last few decades. Its primary idea is to recognise bad news faster than to recognise good news, which means when faced with bad and good news at an equal chance, firms are more likely to take bad news into account but leave good news until verifying with full certainty. Under this condition, there is a possibility of undervalued net assets. Therefore, some claim that use of conservatism violates nature of accounting report to be neutral and would lead to bias and low quality of report at the same time. Since regulations tend to move against conservatism, insight about its generation and influence matters for both operation and regulatory purposes.

2.1.1. Debt contracting as one important origin of conservatism

Among several kinds of explanation of accounting conservatism, debt contracting has long been considered to be the persuasive one as it is widely studied and developed. There are early studies showing researchers' awareness of this relation, such as Gilman (1939), Jensen and Meckling (1976) and Watts (1977). For decades, research went further and deeper into the essential part of debt contracting, which mainly results in conditional conservatism according to Ball et al. (2005).

Watts (2003a) raises several aspects of demand from debt contracting for conditional conservatism in his most well-known paper, and one of them is verification. Due to the existence of information asymmetry and agency problem, managers have incentive to either underestimate the net value of their companies or recognize good news in a more timely manner or both, for the purpose of transferring interests among different parties at the cost of debt-holders by asset substitution (Ball and Shivakumar [2005]). On the other hand, it is possible for managers to adjust firm achievements upwards under opportunism or some other reasons, which are in favour of their interests. The tendency of using strategy in valuing companies and reporting to outside stakeholders leads to higher risk of investing and crediting by shareholders and debt-holders, as they are unable to evaluate the company reasonably before and after their financing decision, sometimes are even misled.

Furthermore, debt-holders have to bear losses if the company faces serious crisis but can hardly earn extra gains when it experiences flourish development and thriving. Watts (2003a) raise the concern of asymmetric payoff between debt-holders and shareholders by elaborating the circumstance that when the company is unable to repay the loan (e.g., going bankrupt), the debt-holders will suffer from interests impairment and losses because of limited liability proposed for corporate borrowers in debt contracting. Accordingly, debt-holders give more attention to the lower side of borrower's net assets out of risk aversion.

Because debt-holders lay more emphasis on the pessimistic assessment of company value, insights and understanding of managers' value verification and report strategy are important to them. Setting restrictions on debt contracting both before and during offering the loan is an effective method for debt-holders to guard the safety of their assets as well as a guarantee of the loan repayment. Since company information available on debt market is one of the key points assisting debt-holders' decision-making process, debt-holders seek for the method which can ease information asymmetry as well as improving the information usefulness, at the same time they consider their efforts as cost and try to reduce it. Next section will further explain how accounting conservatism works in debt contracting.

2.1.2. Conservatism as operational mechanism in monitoring ability

According to review and analysis above, debt-holders hold an inferior position of information in debt contracting, motivating them to find a solution to make up for this disadvantage. Early research of Jensen and Meckling (1976) suggests that debt contracting enhances debt-holders' control ability by setting covenants against violation of the contract. However, evidence from Fama and Jensen (1983) and Hart (1995) shows that it would be costly to only rely on debt covenants to mitigate inconsistency between debt-holders and corporate borrowers. Therefore, monitoring by debt-holders, defined as corporate governance in some academic papers, generates as compensation to debt covenants and subsequently becomes a useful tool (Shleifer and Vishny [1997]).

This point of view also gets support from Watts (2003a) that lenders use 'lower bound measures' (referring to conservatism) to monitor the borrower's ability of payment and to restrict management behaviours like paying too much dividends, which results in the decrease of

corporate net asset value during the debtor-creditor relationship. When debt-holders hold a higher monitoring ability, they can get managers to place their interest at a prior position, and such promotion is usually through putting stricter covenants or involving in corporate governance. The inside mechanism here is timely recognition principle produces the more updated information, which helps managers react more quickly and put enough emphasis on the issue when bad news happens. On the contrary, if managers give no attention to possible loss from bad news, debt-holders can take some actions as a remedy to protect themselves, such as applying the stricter covenants or moving to a higher interest rate when the company fail to achieve the promise set in the contract.

Apart from more timely verification, another reason for debt-holders to strengthen their controlling force is the cost of debt contracts. If they get the borrower operating and reporting in the way which is easier and more convenient for them to process, lenders can enjoy a lower cost of building up the credit relationship as well as managing and maintaining afterwards, which leave them greater profit margins. Furthermore, with competition in the credit market fiercer than it has been in decades, lenders have to reduce the cost to attract new and more corporate borrowers (Ruckers [2004]).

Researchers standing on the other side also get the similar results. For example, evidence from Ahmed et al. (2002), Zhang (2008) and Nikolaev (2010) suggest that accounting conservatism functions in enhancing the efficiency of debt contracts. LaFond and Watts (2008) point out monitoring ability is reinforced by applicable covenants particularly when the execution of debt contract is at risk, and conservatism effectively supports the implementation of covenants. Nevertheless, Armstrong et al. (2010) discourage this literature considering that there is no clear conclusion about how governance acts in reconciling conflicts as well as connecting to conservatism.

2.1.3. Geographic distance as practical measurement of monitoring ability

Monitoring ability itself is not explicitly defined as it embodies in multiple dimensions. Some researchers use intensity of debt covenants but neglect the degree to which these covenants are implemented successfully and, if they impede debt contracting itself, then there probably exist the opposite effect on subsequent monitoring. Unlike debt covenants, monitoring

places more emphasis on governance and is easier to modify afterwards, which adds on flexibility and reduces costs. So apart from covenants which are visible, monitoring also has a direct impact on contracting.

The reliance on information of debt contracting comes from a variety of aspects, and one of them is control needs. Recent literature has provided evidence for the relation between information and the ability of control. When bank lenders hold more affiliated employees in the management of borrower companies, information communications between contracting parties become more efficient and private news is more accessible to lenders, accordingly enhancing their control power (Erkens et al. [2014]).

One important reason that geographic distance between debt-holders and corporate borrowers influences debt-holders' monitoring ability is its effect on acquiring firm-specific information. According to Almazan (2003), the greater distance erodes such acquiring ability to a larger degree. Shorter distance from borrowers enables lenders to conduct the inspection of physical assets and pay a visit personally more easily, and at the same time, the amount of cost generated would be smaller compared to the other condition, which impacts controlling to some extent. For instance, lenders with smaller distance can check as well as screen physical assets of borrowers on a more frequent basis, providing convenience for timely verification. When the cost of verifying become less significant, lenders have more motivation to undertake this mechanism after taking cost-effectiveness into account.

Moreover, closer geographic bank-firm distance adds 'soft' aspect to 'hard' information as a supplement, which is collected locally. Banks gain more confidence with the aid of soft information to screen and monitor borrowers (Petersen and Rajan [1994], Alessandrini et al. [2009]). Other studies such as Agarwal and Hauswald (2010) also support the fact that distance erodes a lender's ability to collect borrower-specific information, which contributes to the literature on the role of distance and information in banking loan decisions.

Considering the relation between distance and monitoring ability makes sense as well from the technical point of view. Some people argue that technology has experienced significant developments in last decades, and nowadays there are more alternatives as replacement of field trips, which weaken the role of physical factors such as distance. However, for long-standing industries which are usually complicated, 'seeing is believing' still dominates in most of the

time. The complexity adds to doubts and uncertainty when a new method is not entirely mutual. On the other hand, fraud in a virtual environment is easier to achieve compared to real assets, for example, making up fake numbers on e-invoices or nonexistent records of transactions. Visual confirmation mitigates the risk of counterfeiting, therefore, enhancing the level of trustworthiness (Van der Veecken and Wouters [2002]).

Furthermore, for critical assets and key operations, there remains the practical need to examine by lenders in person rather than using the high-tech way, which not only provides reliable evidence but also boosts confidence in the credit relationship with borrowers. One thing that the lender should not ignore is the underlying disadvantage of high technology. There are many influential premises as well as dependencies when a new method is still in the development. Consequently, its successful implementation relies on the fact that every step of the process is free from error, which can be more costly for lenders to ensure. If lenders can only expect limited benefits and convenience while spending too much effort, they prefer not taking the risk. Therefore, it is useful and practical to study geographic distance as a basic physical feature in the process of verifying and monitoring.

2.1.4. Conservatism difference due to internal and external factors

Found by Ball et al. (2000), the prior evidence in that paper shows needs of conservatism vary from countries which apply to common law to those adopt code laws. Later researchers such as Giner and Rees (2001) and Lara and Mora (2004) support this view and provide the conclusion that degree of conditional conservatism is higher in common law countries than code law countries. Diverse institutional characteristics have the significant influence on agency costs and cost of equity, thereby affect conservatism ultimately. However, research which contains the comparison of European code law countries and UK reaches to opposite conclusion when investigating unconditional conservatism (Giner and Rees [2001]).

Other market features would lead to the difference in conservatism as well. Ball et al. (2008) suggest that as for conditional conservatism, when the size of the debt market is larger, the overall degree of conservatism among observations is more significant, while the scale of the equity markets does not have the same effect.

The own intention and extension of accounting reporting are also changing over time. With

the continuous development of accounting and economy, both in theoretical and practical aspects, the role of accounting reporting has been turning into stewardship and being useful to decision-making, according to conclusions in IASB/FASB framework. Based on this view, information which generates for administration and forecast is becoming more and more valuable in accounting reporting and, conservatism can cause confusion and interruption in this process, for the reason that using conservatism in the earlier accounting periods would delay part of revenue to the next few periods.

To adapt and coordinate such change, litigations and regulations have kept reforming themselves. An example is regulation change in the United States, from supporting to discouraging. The implementation of SAB (Staff Accounting Bulletin) 101 by SEC in 1999 enhances the degree of conservatism by encouraging a conservative way of revenue recognition. However, the outcome tends to be negative: Some research find that with the help of SAB 101, it took less effort for companies to achieve certain earning goal because managers were granted larger discretion in their accounting choice (Altamuro et al. [2005]). Other research like Crawford et al. (2011) also show the increasing possibility of earning management after the adoption of SAB 101. Nevertheless, there is still no clear clue about whether the impact of SAB101 has been completely negative.

As a consequence, in 2006, FASB (Financial Accounting Standards Board) joint with IASB (International Accounting Standards Board) stated that conservatism implies a bias in financial reporting information, which goes against the neutral principal of accounting. In 2010, FASB and IASB took a position towards this issue by excluding conservatism in their Conceptual Framework for Preparation and Presentation of Financial Statements.

Regulation change also took place in other regions besides the U.S. In Europe, accounting principles are deviating from conservatism in certain aspects of reporting. For example, in the paper of Hellman (2008), the author takes IAS 11, 12 and 38 as instances and argues that comparing to regulations in the earlier period, there has been a trend against conservatism. In general, regulations lay stress on neutrality to a larger extent, consequently discouraging conservatism in accounting reporting at the same time.

2.1.5. Other features relative to research settings

In this thesis, I would focus on banks as the most influential debt-holders for corporate borrowers, following suggestions in previous studies. There are several advantages of adopting this setting, and a significant one is simplifying the procedure of measuring distance, which adds to accuracy as a result. On the other hand, bank lenders are also more rational therefore less likely to be affected by random factors. Moreover, it is almost not possible to collect distance information of public debt-holders, considering there are numerous investors and most of them only hold relatively small amount of debt.

Apart from benefits, limitations are worth noticing as well. Prior literature considers bank loans as private debt, which has the significant distinction from public debt. Evidence shows that private debt-holders can gain more insider information which is not accessible to public debt-holders. Under this circumstance, Nikolaev (2010) argues that because of advance information acquired from private debt relation, banks would not demand accounting conservatism as much as public debt-holders would do.

On the other hand, banks hold alternative methods except for requiring conservatism. One example is the use of renegotiation over debt covenants during the lifetime of loans. In practice, it is common for banks to experience violations of debt covenants, so once they happen, lenders would arrange negotiation with borrowers to solve the conflict, after which lenders' monitoring ability would reinforce (Nikolaev 2010).

Another protection mechanism that bank lenders usually employ is the requirement on the level of collateral. When issuing a loan, debt-holders would take a careful look at the payment ability of corporate borrowers, then demand collateral at the certain value according to the assessment result and own the proprietary rights over collateral during the whole contract period. In this way even if the borrower fails to pay back the debt, debt-holders have rights to sell the collateral to compensate for that contract, which helps to control loss as well as risk at an acceptable level. There has been evidence showing the effectiveness of such procedure, such as Berger and Udell (1990) and Strahan (1999), diminishing conservatism in monitoring to some extent.

Other settings like the scope of research can also generate bias. When looking at the interpretation of conservatism, the most widespread one refers to the timely loss recognition principle. However, the 'timely recognition' can be different from country to country according

to local accounting principle, which makes it less comparable. In other words, regulations in some regions are stricter with recognition per se, that is, conservatism generates as firms' reaction to regulations regarding recognition. Furthermore, some regulations that move towards a more timely manner over time catalyze and strengthen the motivation of conservatism (Watts [2003a]). Nevertheless, according to Ball and Shivakumar (2005), the reporting manner of borrower results from complicated interaction between market demands and regulation, so it is far from conclusive that whether various policies can bring along difference and how influential they are.

Ongoing debates over conservatism in literature have lasted for several decades. Explanations vary since there is no single theory clarifying all interactions, whether for the functioning mechanisms or stakeholders. Besides, it is not possible to determine a general law that is applicable in all cases due to the complexity of business activities and continuous changes. Hence, a common way that specifies settings and subjects is practical for further investigation.

After reviewing existing literature, I found deficiencies in explanations of monitoring ability to conservatism and inadequate evidence, which motivate this thesis. The starting point is to bridge the gap between various theories and provide insights from the debt contracting point of view.

2.2. Main contribution

Conservatism has a significant impact on the whole debt market, therefore is of great importance to contracting parties as well as regulators. Understanding its mechanism not only benefits stakeholders by optimizing contracting relation while providing lenders with assurance and confidence, but also adds to effectiveness and efficiency of regulations, and ultimately encourages growth in debt market.

There have been researchers arguing that debt-holders with the shorter distance from borrowers have more access to firm-specific information, which enables them to monitor borrower performance with less efforts than distant lenders (Berger and Udell [2002]). Banks, as a critical component of debt-holders, are considered to hold less monitoring ability when bank-firm geographic distance increases (Almazan [2002], Degryse et al. [2007]). However,

previous researchers only develop this relation on theoretical derivation but not study in the empirical way, which can provide persuasive and reliable evidence to support it.

Moreover, most studies regarding the effect of debt-holders' monitoring ability on accounting conservatism focus on the contract covenants, but few explores the role of geographic distance, which affects monitoring ability to a large extent as well. It remains meaningful to take a careful look from distance point of view to see the extent of influence, and empirical investigations should take place as a supplement, which raise awareness of geographic distance as an influential factor. A more comprehensive understanding of broader scope helps stakeholders to make more reasonable decisions when facing with trade-offs.

For corporate borrowers, if they have gain the knowledge in relation between distance from lenders and monitoring they are facing, they can response positively by selecting lenders adversely; for bank lenders, they can reduce the cost of issuing the loan and achieve greater profit. As a consequence, the market functions more effectually as more information is available on the market and all sides can arrange their action more rationally.

It is also worth mentioning that geographic distance has entered into researchers' awareness in recent years. For instance, Hollander and Verriest (2016) has discussed the impact of geographic distance on the design of bank loan contracts, which establishes the association from the information point of view. Their research methodology also provides solid evidence for the reasonability of such relation.

This thesis intends to contribute to contracting debt theory of accounting conservatism by connecting geographic distance to conservatism and exploring the underlying relation between them, which is also a complement to the existing debt contract literature, and using empirical method to examine the reliability and robustness inside the relation. By giving insights into motivation and operating mechanism of accounting conservatism from a more comprehensive view, it helps firms to make adjustment and modification of their debt financing decision and enable debt-holders to improve investment efficiency, as well as promoting policy effectiveness by regulators.

3. Hypothesis development

As shown in the contracting debt theory, debt-holder demands accounting conservatism due to its asymmetric payoff compared to shareholders. When the borrower firm performs poor, debt-holder is exposed to a high level of risk in the potential loss but has little to gain when the performance of borrower beats expectations (Ahmed et al. [2002], Watts[2003]). Thus, debt-holder tends to exercise monitoring ability to protect its interest by limiting loss in liquidation. One effective measure that lenders would take is prompting accounting conservatism in borrower firms, which not only reduces the risk of loss incurring but also adds on assurance level and enhance their confidence in debt.

Moreover, closer geographic bank-firm distance adds 'soft' aspect to 'hard' information as a supplement, which is collected locally. Banks gain better ability to screen and monitor borrowers with the aid of soft information (Petersen and Rajan [1994], Alessandrini et al. [2009]). Other studies such as Agarwal and Hauswald (2010) find evidence that distance erodes a lender's ability to collect borrower-specific information, which contributes to the literature on the role of distance and information in bank loan decisions.

In combination with the classic debt contracting theory, the underlying mechanism connecting distance, monitoring and conservatism leads to the following hypothesis:

H1: Corporate borrowers with longer geographic distance from debt-holders exhibit larger extent of accounting conservatism compared to firms with shorter distance from debt-holders.

The hypothesis indicates the positive association between conservatism and distance. Correspondingly, the null hypothesis of H1 is that corporate borrowers with longer geographic distance from debt-holders do not exhibit larger extent of accounting conservatism compared to firms with shorter separation from debt-holders.

On the other hand, apart from the geographic distance as an external factor, the firm-specific characteristic can affect the degree of accounting conservatism from the inner side of the company, mainly from the information perspective. For firms that are growing faster, the information asymmetry tends to be more severe because of the larger uncertainty and higher

possibility of agency conflicts, so they may have the greatest incentive to choose the conservative strategy to meet the needs of debt covenants, litigation or self-development. Firms that are highly profitable are found to be less transparent in the information disclosure (Wallace and Naser [1995], Wallace et al. [1994]), which may also have an impact on their conservative level. Therefore the following hypothesis is designed from this prospective, also as a complementary to H1:

H2: The extent of accounting conservatism will be more pronounced among borrowers with less information transparency, such as firms with higher growth rate or profitability.

Although evidence at current stage shows that theoretically, the possible relation goes in the way of positive-correlated, there is still likely to exist the influence that has an opposite effect, which increases the occurring chance of null hypothesis 1 to some extent.

Firstly, the fast development of new technology has been reforming the traditional way of information generating, processing and spreading continuously. As discussed in last part, it takes less effort for debt-holders to gain sufficient information whether in time or cost nowadays. On the one hand, the increase of press and media ensures the news and information travelling around the world at a faster speed, therefore lenders can learn and recognize news at a more timely manner. Also with the help of improvement in technology, lenders now have more and better methods to collect adequate information in terms of quality and quantity. On the other hand, news and information are becoming more and more informative, promoting the extent of transparency at the world level while adding on the difficulty to hide scandals, bad news or surprise. As a result, the role of conservatism in collecting information is weakened relatively, decreasing its usefulness at the same time.

Another case is ongoing improvement of accounting principles and legal regulations, affecting and acting on all parties among the debt market. Currently, the mainstream view of regulators worldwide towards accounting reporting is that reports should be neutral, for the reason that any other tendency would result in bias in the long term, bringing the risk of being used as a tool for earning management as well. When managers have more discretion in reporting the result, it is easier for them to announce the successful achievement of earning

goals, and biased result only benefits few parties but not all the stakeholders. Consequently, to limit such deficiency in reporting, accounting conservatism is discouraged by regulators to eliminate the possibility of opportunism, thus keeping the market organizing in good order as well as reaching a robust growth.

In the past decade, there have been adjustments with regard to conservatism on critical regulations and principles for several times. Hence, the change in tendency towards accounting conservatism leads to the third hypothesis:

H3: the level of variability in accounting conservatism rises over time.

4. Research design

This section concentrates on the methodology throughout this thesis and the way to achieve research goals. As essential preparation for empirical study in the later chapter, it provides premise which converts theoretical concept to variables that are measurable and quantifiable, and the reason for choosing these variables that roots in theories. An overview summarising the research design in this thesis is the Libby box, which is attached in the appendix at the end, explicitly indicating the association between conceptual and operational variables and the direction of them.

Key indicators to be measured in this thesis are debt-holders' monitoring ability and accounting conservatism in corporate borrowers. Previous studies and theories have left various choices which are practical and of great significance, but the decision would be more rational and appropriate if taking the particular thesis settings and conditions into consideration, such as the scope of sample, applicable country, data availability and the certain research time period.

4.1. Geographic distance as proxy of monitoring ability

Monitoring is a concept with quite an extensive range. It is hard to define it only using certain qualities due to the wide scope in which it functions and influential effect it has. Such features make it never standing alone, therefore there are many reasonable interpretations from different aspects.

In prior chapter, literature review has theoretically explained the relation between geographic distance and monitoring ability, in which roots the essential reason for choosing it. Moreover, there are other benefits and reasons for employing geographic distance as proxy of monitoring capabilities.

A primary strength of using geographic distance is that it can be measured directly and accurately. After acquiring the detail of a bank loan, there remains no doubt that the measurement of distance should take place between head offices of lenders and borrowers, and the Internet has granted adequate information to obtain such information. Furthermore, thanks to the fast development of technology, the data collection process has been simplified and the accuracy has been improved to a large degree, along with effort and cost at a relatively little

amount. The information is also assessable to every researcher without too many requirements. Such advantage makes it suitable for quantitative research and can reduce deviations comparing to other indirect methods. Thereby, successful transformation of perceptual concept to quantitative expression enables the way of empirical studying, rather than only persisting on a theoretical level.

Another reason worth mentioning is the incentive underlying in this thesis, which comes from the need to supplement literature deficiency and add on integrity. Previous study only suggests long distance erodes a lender's ability to collect borrower-specific ('soft') information but few provides evidence that whether lender would use these information to reinforce their monitoring ability, and the mechanism of information in supplying conservatism is not clear yet.

Clarifying the significance of information and its functional principle have meaningful implications. Generally, requiring conservative reporting costs less of debt capital compared to setting stricter covenants or pre-screening when lenders lack confidence in borrowers' repaying ability. Evidence suggests covenants that are too tight or too hard discourage business activities while cost a bit for all parties. If soft information helps to provide insights in debt contracting, both lenders and borrowers benefit from it and then the whole debt market would become more active and efficient. One research purpose of this thesis is to confirm the role of soft information in debt contracting. By exploring such association among information, distance and monitoring and then studying the effects on conservatism, there would be reasonable support for stakeholders to optimise their decisions, promoting the development of debt market as a whole.

4.2. KW model as research model of accounting conservatism

In academic, the consensus is that Basu model in 1997 is one of the most sufficient estimations which can capture the extent of conditional conservatism in firms. This classic model incorporates conservatism by investigating different reaction in earnings and market return. When conservatism is employed in the company, earnings reflects such accounting principle by responding differently to good news versus bad news, while market return captures good news and bad news all together. Therefore, the difference between earnings and returns

can be explained as asymmetric timeliness of recognition. Basu (1997) offers basic model as below:

$$\frac{\Delta E_{it}}{P_{it-1}} = \alpha_0 + \alpha_1 D + \gamma_0 \frac{\Delta E_{it-1}}{P_{it-2}} + \gamma_1 D \times \frac{\Delta E_{it-1}}{P_{it-2}}$$

Where ΔE refers to change in earnings; P is stock price at different periods; D is a dummy variable which equals to 1 when ΔE is negative, representing bad news in the regression. So under settings in this model, γ_1 captures the different response of earnings to good news versus bad news. The larger the value of γ_1 , the greater conservative of the company. As shown in Basu (1997), empirical tests successfully support his hypothesis that examines asymmetric timeliness. In other words, this 'reverse' regression can capture the firm-specific accounting conservatism, which provides essential foundation for follow-up studies.

However, there are also researchers who hold discouragements from taking Basu model into use. Some argue that this estimation is vulnerable that many conditions and factors can affect and result in change in outcomes, and others doubt the validity of Basu measure (Dietrich, Muller and Riedl [2007]; Patatoukas and Thomas [2011]), although later evidence from Ball et al. (2013) shows Basu model is valid, from an econometrical point of view.

Nevertheless, the drawbacks existing in Basu model should not be ignored. For example, the endogeneity problem in the regression could lead to bias in results, and using stock returns as a proxy for good or bad news may introduce noise when measuring the asymmetric timeliness. Evidence from Givoly et al. (2007) also shows a negative correlation between conservatism measured in Basu model and other methods. Patatoukas and Thomas (2010) raise concern that bias can also generate with different scale of company value when estimating conditional conservatism, which is due to two relevant empirical regularities yet has nothing to do with conditional conservatism.

Under the fact that Basu model has deviations to some extent, Khan and Watts (2009) put forward the Firm-Year measure of accounting conservatism as a modification of original Basu model, by adding G_Score and C_Score as estimates of good or bad news, which incorporate firm-specific characteristics. Their expressions are listed as below:

$$X = \beta_1 + \beta_2 D + \beta_3 RET + \beta_4 DRET + \varepsilon \quad (1)$$

$$G\ Score = \beta_3 = \mu_1 + \mu_2 MV + \mu_3 MTB + \mu_4 LEV + \varepsilon \quad (2)$$

$$C\ Score = \beta_4 = \lambda_1 + \lambda_2 MV + \lambda_3 MTB + \lambda_4 LEV + \varepsilon \quad (3)$$

MV is the market value of equity; MTB is the market value of equity divided by the book value of equity; and LEV is total debt divided by total assets. These three features are specified for each company and are unique per firm per year. β_4 is the proxy of conservatism since it captures the differential response of earnings to good news versus bad news, which will show as COV in the final regression.

According to KW (2009), C_Score is derived from linear functions of three firm-specific characteristics that vary under conditional conservatism: size, the market-to-book ratio, and leverage. Compared to the most widely used measure by Basu (1997), the newly firm-year measure C_Score better captures the cross-sectional and intertemporal variations in the conservatism for each individual firm without requiring a long time series of data, thus provide more accuracy and persuasiveness to the empirical result. On the other hand, the dependency on large amount of sample data can be eased to some extent.

Consequently, the integrated model in KW (2009) is:

$$\begin{aligned} X = & \beta_1 + \beta_2 D_i \\ & + RET_i * (\mu_1 + \mu_2 MV_i + \mu_3 MTB_i + \mu_4 LEV_i) \\ & + D * RET * (\lambda_2 MV_i + \lambda_3 MTB_i + \lambda_4 LEV_i) \\ & + \delta_1 MV_i + \delta_2 MTB_i + \delta_3 LEV_i + D_i * \delta_4 MV_i + D_i * \delta_5 MTB_i + D_i * \delta_6 LEV_i + \varepsilon_i \end{aligned}$$

Considering the advantage of C_Score and its complementary role to classic Basu model while trying to avoid potential deviations during regress process, this thesis would adopt the C_Score method above as the measurement for accounting conservatism, to increase relevance and reliability to the testing results.

4.3. Control variables

According to analysis in theoretical part, accounting conservatism results from multiple internal and external factors, and can change over time. The level of accounting conservatism

varies across corporate borrowers in the market, determined by firm-specific characteristics. Following the most frequently used method in relevant literature, such as Khan and Watts (2009), the distinctive feature of a company includes firm size, solvency, financial risk and profitability.

Size: The extent of information asymmetry is usually lower in bigger firms than in smaller firms, partly because there are a lot of analysts who follow big firms in the market. They not only provide insight by studying the firm performance in previous periods, but also forecast the future with a comprehensive understanding of that company and the market trend. Consequently, more information is available to stakeholders in the market. On the other hand, there is more focus laid on big firms and people pay closer attention to them, making the news spreading at a higher speed. As a result, it is hard for the company to hide the bad news so the transparency increases.

Apart from different quantity and quality of information, the costs of violating laws and regulations are also much higher for large companies. To avoid damage to their reputation and mitigate the risk of involving in litigations, big companies hold more incentives to adopt the conservative method voluntarily.

Market-to-book ratio: The high market-to-book ratio is the signal of existence of uncertainty. When the company is experiencing a steady period of operation and development, investors in the market are able to form rational decisions, so there would not be a significant fluctuation between its book value and stock price, which indicates the expectation of investors. Correspondingly, when uncertain and surprise exist, it is difficult for investor to price the company reasonably, hence the stock price would be volatile. Under such circumstance, the risk of being sued by stockholders increases for the company, so using a conservative method of reporting can ease the surprise to some extent, which protects the company from litigation.

Previous studies also find another important mechanism between book value and the price. For potential investors, a high market-to-book ratio indicates the appropriate investment opportunity. But in the meanwhile, the agency cost would be high if the company is suitable for investment. Since using conservatism reduces the agency cost, the association between conservatism and market-to-book value is believed to be active in practice.

Leverage: Leverage measures the ability of the company to meet its long-term debt obligations. It plays an important role in evaluating the solvency and capital structure (Khan and Watts, 2009). When the leverage ratio of the company is high, it indicates more creditor financing (bank loans) is used than investor financing (shareholders). So the very frequent use the leverage ratio is to compare the positions of lenders and investors and consider their behavior under certain conditions.

Agency problem is severe for high leverage firms as debt-holder and shareholder have conflict interests, and management is also engaged in the interaction. Consequently, all parties concerned are seeking for constraints, which can limit interest from favoring any side at the cost of impairing others. Enhancing the use of conservatism promotes the timely verification of accounting numbers and recognition of loss, if any, and thereby improving the credibility and adding on the confidence of investment. Another effective method in use is setting more strict covenants in contracting, thus preventing speculations and unbalance to either side. However it is costly to set up and maintain the restrictive covenants.

ROA: Return on assets reflects the company's earning capacity in a certain period, which evaluates the profitability. The survival and development of an entity are highly dependent on the profit it can gain, so it is the foundation to stand in the market. The ROA figure gives stakeholders the implication of how effectively the company is operating for earning and the potential in the future. A higher ROA shows that the company can earn more money on less investment, which represents its underlying value.

ROA is of high importance to debt-holder in many aspects, and the most critical one in practice is lenders determine their risk by evaluating the solvency of borrowers and then make decisions whether to issue the debt. On the other hand, the bank who issues long-term loan to borrower values such indicator to a larger extent due to the higher risk laying in the longer period. As a result, the lender intends to control the risk of losing by pre-screening the borrower of its profitability and following during the entire time of loan. When there is sign suggesting the increase of risk, it takes monitoring method and mitigate the risk to an acceptable level.

Apart from the indicators mentioned above, there are also some other important factors which should be included in the regression as control variables, considering their benefits of improving correlations as well as the potential influence on the result.

Growth: It is great for a company to experience the time of development and grow at a high rate. However, credit decisions and follow-up made by lenders can go both way when the corporate borrower is growing rapidly. On one hand, the fact that fast growing firms have good ability to produce cash flows in the future enhances confidence in debt-holders and thereby facilitates debt decisions. Under this opinion, the lender would lower his requirements before entering the loan and allow the more 'relaxed' covenant. As a result, it eases restrictions in monitoring and controls to some extent.

On the other hand, evidence shows that information asymmetry in fast-developing company is more severe. For the lender, the borrower becomes less transparent so the potential risk also increases. As the lender tends to be risk averter, it adjusts the power of control frequently to adapt to the ongoing change. Therefore it is hard to predict the association between the growth of borrower and the control of lender, and there is no explicit conclusion yet.

Auditor: This factor is closely related to the accounting principle and accounting quality of the borrower. In general, large and famous auditors provide better assurance with regard to quality and quantity. Their independency and integrity add on the relevance and reliability of financial reports. To guarantee their work with trustworthiness, auditors put restrictions to standardise the report after communicating with client company.

However, auditors also have the tendency towards certain qualities. Big auditors, especially Big-4, live on their reputation to a large extent. Therefore, the cost of being found to have hazard or issue is higher for them compared to others. Apart from adopting control methods to improve report quality, they also have motivations to be conservative in their opinion, which reduces their risk of violating regulations and losing names. Consequently, the company who hires reputed auditors is impacted in terms of accounting principle and the reporting strategy.

The table below provides an overview of control variables determined for the regression,

together with the way of calculation and specific indicators.

Control variable	Indicator	Calculation
Firm size	<i>Size</i>	= Market value of equity
Market-to-book ratio	<i>M/B</i>	= Market value of equity / Book value of equity
Leverage	<i>Lev</i>	= (Long term debt + Short term debt) / Market value of equity
Return on Assets	<i>ROA</i>	= Annual returns / Total assets
Growth	<i>Revenue growth</i>	= $(Revenue_t - Revenue_{t-1}) / Revenue_{t-1}$
Auditor	<i>Auditor</i>	<i>Dummy</i> , NonBig-4 = 0 while Big-4 = 1

4.4. Regression model after integration

Following the main hypothesis in this thesis, the purpose of regression is to study the association between distance and accounting conservatism, along with several control variables.

Overall, the regression model will be in this form and estimated using OLS regression:

$$COV = \alpha_1 + \gamma_1 DIS + \delta_1 Size + \delta_2 M/B + \delta_3 Lev + \delta_4 ROA + \delta_5 Revenue\ growth + \delta_6 Auditor + \varepsilon_1 \quad (4)$$

Accordingly, COV stands for accounting conservatism and DIS represents the distance between the lender and the borrower. Other control variables show in the regression as their indicators provided in prior section.

Hypothesis H1 predicts that the coefficient on DIS variable (γ_1) will be positive.

Hypothesis H2 predicts that the coefficient on ROA variable (δ_4) and Revenue growth variable (δ_5) will be positive.

Hypothesis H3 concerns the variability of accounting conservatism, so the corresponding prediction is the standard deviation of conservatism will increase over time.

5. Data

5.1. Sample Selection

The first step of sample collection is to decide on the period in which the debt loans took place. After consideration, the sample period used in this thesis contains four years, starting from 2010, which mainly bases on following reasons: timeliness, accuracy and outside influencing factors including financial environment and litigation changes.

For an individual company, the accounting conservatism changes each year as the market value of equity, total assets and debt is changing over time, according to the measurement of conservatism shown as C_Score in the model. On the other hand, information disclosure is also increasing in recent years at the request of investors, analysts, and policymakers, and the development of high technology has improved the information accuracy significantly. To make the results more reliable and can be used as suggestions for future, it is important to keep the sample up-to-date, adding convincing to theories at the same time.

The sample would focus on U.S listed companies because debt market in U.S is more mature and stable, so it is less likely to be disturbed by random factors. Another reason is that most databases and datasets are focusing on U.S firms, which simplify the data collection process, therefore, enhance accuracy and efficiency. However, the financial crisis in 2008 was so severe and influential that it is hard to avoid its impact. Under this case, starting from 2010 would be appropriate, given the time for ‘economic recovery’.

It is also worth mentioning that the trend in accounting litigation towards conservatism changed in recent years. In 2006, FASB joint with IASB stated that neutrality is incompatible with conservatism, which implies a bias in financial reporting information. However, Conceptual Framework for Preparation and Presentation of Financial Statements in 2010 excluded conservatism, which was issued by IASB and FASB. Such adjustments show conservatism is no longer considered as a desirable quality of financial reporting information, and instead ‘faithful representation’ is valued to a larger degree and shows as a fundamental quality characteristic, which concentrates on completeness, neutrality, and freedom from errors to a larger extent. It is possible that difference resulted from the regulation change would be incorporated into the analyses and can have impact on the outcome as well.

After deciding on timing, the criteria for sample selection sets up, taking the availability of data from various databases into account as well. This thesis uses DealScan to extract bank loans from corporate borrowers, as DealScan not only includes the amount of each transaction (refers as ‘facility’ in DealScan) but also provides detailed information of borrowers such as their address. Based on the amount of deals and operating regions of corporate borrowers, the main part of sample comes out of available records. Table 1 below provides details for this selection process:

Table 1. Observation

Sample procedure	Number of observation
Total number of observation 2010 - 2013	8,745
<i>After excluding financial institutions, real estate and assurance (SIC 6000-6999)</i>	6,934
<i>After excluding companies with missing data for variables required for regression</i>	3,760
<i>After excluding companies with deal amount in bottom 10% for bank loans</i>	3,344
Observations per year	
2010	700
2011	1,069
2012	792
2013	783

Table 1 includes the detailed sample procedures and the number of observation after each selection step. The original sample comes from DealScan. The selection procedures follow the common practice and the thesis employs STATA to perform these procedures.

For the observations left, in total 119 unique banks issued those loans during these four years. As most of the address information for banks in DealScan is blank and also many are incomplete or missing, this thesis employs data set from the website of Federal Deposit Insurance Corporation (<https://www5.fdic.gov/idasp/advSearchLanding.asp>), which provides

address and post code for bank head office in U.S and other countries. After extracting 87 banks that are available in this database, the missing ones are manually collected from their official websites. So in total, there are 119 banks as lenders for the sample period.

To measure the geographic distance, the calculation procedure in Appendix B takes place for each borrower-lender group, which computes distance based on longitudes and latitudes of every starting point and ending point. By this way, the exact separation between each origin-destination is captured accurately. The unit for distance is mile, following the same pattern in Hollander and Verriest (2016).

Other financial information, such as market to book value, revenue per fiscal year and total debt, come from CRSP and Compustat. The following table shows the exact source for each variable in the model.

Table 2. Source per variable

Name of variable	Source
Ln(Distance)	DealScan, website of Federal Deposit Insurance Corporation, official website of bank and computation by excel
M/B	Compustat
Lev	Compustat
Ln(Size)	Compustat
C_Score, G_Score	KW model (2009), Compustat and CRSP
Revenue growth	Compustat
ROA	CRSP
Auditor	CRSP

Table 2 presents the source for each variable in the regression model, following the common practice of papers in the reference, such as Khan and Watts (2009). The calculation step of geographic distance can be found in Appendix B and the unit of distance is mile, following the pattern of Hollander and Verriest (2016).

5.2. Descriptive statistics

Descriptive statistics usually include the number of observations, mean value per data set, the standard deviation which measures the variation of each variable, and the minimum and maximum value for variables. Table 3 presents these data characteristics as a basic overview of

the independent variable, dependent variables, and control variables.

Table 3. Descriptive statistics

variable	N	Mean	Std. Dev	Min	p25	p50	p75	Max
Ln(Size)	3339	7.79	1.66	-4.01	6.7	7.75	8.84	12.99
M/B	3335	2.73	3.90	-9.82	1.26	1.95	3.03	26.46
Lev	3321	0.66	0.99	0.00	0.17	0.37	0.71	6.58
ROA	3338	0.14	0.09	-1.14	0.09	0.13	0.17	0.95
Revenue growth	3316	0.13	0.25	-0.32	0.01	0.08	0.18	1.56
Ln(Distance)	3248	6.3	1.75	-3.44	5.63	6.7	7.45	9.65
Auditor	3344	0.92	0.27	0	1	1	1	1
C_score	3303	-0.29	2.83	-18.76	-1.92	-0.56	0.67	18.04
G_score	3303	0.07	0.29	-4.27	-0.06	0.05	0.17	1.75

Table 3 presents the descriptive statistics for variables in the main regression model. The source for each variable can be found in table 2. The calculation step of distance can be found in Appendix B and the unit of distance is mile, following the pattern of Hollander and Verriest (2016).

In general, the statistics above show the diverse features for different variables. As the sample includes companies from various industries and regions within the United States, the individual difference is significant and there is no certain rule that can conclude them concisely. One interesting insight from the statistics of Auditor is that most companies in the sample tend to choose Big-4 audit firms as their auditor, which shows a relatively high central tendency in audit industry. Another thing that worth mentioning is the great variation in Market-to-book ratio. Since all sample firms borrow from banks in that period, the reasonable explanation is that borrowers determine their financing decision and proportion according to their financial position and strategy.

5.3. Correlations

Table 4. Correlation matrix

	Ln(Size)	M/B	Lev	ROA	Revenue growth	Ln(Distance)	Auditor	C_Score	G_Score
Ln(Size)	1	0.646***	-0.199***	0.048**	0.172***	0.024	0.174***	0.196***	0.694***
M/B	0.034*	1	-0.414***	0.237***	-0.012	-0.021	0.032*	0.256***	0.423***
Lev	-0.012	-0.003	1	-0.143***	-0.121***	0.080***	-0.031	-0.163***	-0.230***
ROA	-0.016	0.017	-0.078***	1	0.021	-0.039*	-0.033*	0.629***	0.622***
Revenue growth	-0.002	-0.000	0.202***	-0.124***	1	-0.005	0.042*	0.115***	0.121***
Ln(Distance)	0.025	-0.018	-0.019	-0.017	0.002	1	0.013	-0.035*	0.023
Auditor	0.081***	0.001	0.007	-0.029	0.009	0.030*	1	0.012	0.166***
C_Score	0.004	0.002	-0.600***	0.155***	-0.864***	0.007	-0.006	1	0.628***
G_Score	0.333***	0.018	-0.438***	0.198***	-0.833***	0.018	0.030	0.901***	1

This Pearson-Spearman matrix table shows correlations between the variables of interest. ***, ** and * reflect the statistical significance of the coefficients at the 1%, 5% and 10% level, respectively.

Table 4 shows the correlation matrix for variables used in calculating accounting conservatism (C_Score) and geographic distance, over the period 2010 to 2013. The lower half part which is on the left side indicates the Pearson correlations and the right upper part reports the Spearman correlations. Consistent with previous studies, such as Smith and Watts (1992) and Khan and Watts (2009), the Pearson (Spearman) correlation between leverage and M/B is -0.00281(-0.414), indicating a negative relation. Besides, the positive correlation between auditor and size follows the idea that larger companies are more likely to choose big-4 audit companies as their auditor, and such relation is significant. Moreover, firms which are larger and have a higher return tend to apply conservatism reporting more, which is consistent with regulatory requirements and litigation risk explanations in previous studies. However, the relation between C_Score and distance exhibit opposite directions in Pearson and Spearman correlations, and the positive relation is small and not significant, indicating conflicts with the expectation of hypothesis.

6. Result

This part includes the analysis of data, which is in good order after collection and arrangement, and result of the main regression model. As this thesis uses a 4-year panel dataset, ongoing changes in the major variables are of interests and data trends are worth noticing. This part will also answer the hypothesis put up in part 3 according to evidence coming from the regression model, after taking all other conditions into consideration.

6.1. Main findings

H1: Corporate borrowers with longer geographic distance from debt-holders exhibit larger extent of accounting conservatism compared to firms with shorter separation from debt-holders.

After analysing the features and change in the dependent variable over time, the most important question to be answered is the hypothesis 1 put up in the previous part, which is also listed above. To examine the relation between geographic distance and accounting conservatism, this thesis employs Stata as the analysis tool for empirical study, as it is the most commonly used and efficient way in academic. This part will show the procedure of setting up regression model and the final results from the regression analysis.

As described in sample selection section, the sample in this thesis includes firms which borrowed from banks in the period of 2010-2013. Some companies borrowed several times during these years, from the same or different banks, so there are 1,763 individual firms in total. Together the firms and banks composite the sample which can be concluded as short and unbalanced panel data.

To decide the regression model between fixed effect model and random effect model, Hausman Test is performed to see which model can better capture the data characteristics. Table 5 below shows the result of the test.

Table 5. Hausman Test result

chi2(5)	42.68
Prob>chi2	0.0000
Hausman's test for H0: X is independent of residual	
Table 5 presents the result of Hausman test, which uses data from the sample in Section 4. The purpose of Hausman test is to compare the results from fixed effect model and random effect model.	

In Hausman test, the coefficients of both FE and RE are estimated then checked together. Under the null hypothesis, both of these coefficients are consistent, but coefficients from random effect model are efficient. Under the alternative hypothesis, coefficients from fixed effect model are consistent, whereas coefficients from random effect model are not. From table 6, the p-value is equal to 0.0000, so it is clear that the null hypothesis is rejected. Consequently, the model in main regression will be estimated using the FE.

After deciding FE model, whether to control time (year) in FE model should be taken into consideration. If so, two-way fixed effects model should be introduced to control for the time effect in the sample. Here this thesis employs time dummy variables and uses F test as the joint significance test for time dummy variables. Table 6 provides the detail of F-test result.

Table 6. F-test (Joint significance test for time dummies)

F(3, 1151)	43.92
Prob > F	0.0000
H0: time effect does not exist in sample period	
Table 6 presents the result of F-test. The purpose is to further examine the validity of FE model and decide whether the time effect should be taken into consideration in the regression.	

P-value is 0.0000, so the null hypothesis can be strongly rejected, that is to say, time effect does exist in the sample. Therefore, the main regression will be performed based on two-way fixed effects model.

Table 7 shows the coefficients of the variables, the t-statistics, and the p-value as obtained through the regression analysis using two-way fixed effects model. T-statistics are reported based on standard errors that are robust to heteroskedasticity, serial and cross-sectional

correlation with a two-dimensional cluster at the firm- and year-level.

Table 7. Regression result

Dependent variable = C_Score (accounting conservatism)				
Variables	Pred. Sign	Coefficient	t-statistics	p-value
Ln(Distance)	+	3.6855	1.71	0.088*
Revenue growth	+	5.7853	1.02	0.309
Lev	+	-13.4096	-2.4	0.017**
Ln(Size)	+	0.0001	0.75	0.451
M/B	+	1.4308	3.2	0.001***
ROA	+	-4.0778	-1.98	0.047**
Auditor	+	0.3821	0.01	0.989
Number of observations			3,153	
Prob > F			0.0733*	
R-squared(within)			0.6634	

Table 7 presents the results of the two-way fixed effects regression on a sample of 3,153 firm-years from 2010 to 2013, in which the dependent variable is the level of accounting conservatism of the borrower (C_Score). Ln(Distance) is the natural logarithm of distance. Other variables are defined in Section 4.3. The source of data can be found in table 2. This thesis uses ***, **, and * to reflect that the coefficient estimate is different from zero at the 1%, 5%, and 10% levels (two-tailed), respectively.

The interpretation of the result lies in two aspects: the significance level and the overall R-squared. First, the table shows that the p-value for Ln (Distance) is 0.088, and its coefficient is 3.6855. That is to say, there is a positive relation between distance and accounting conservatism, and conservatism increases at a speed of 3.6855 when distance increase one unit. What should also be mentioned here is that the influence of geographic distance on accounting conservatism is significant at a 10% level. On the other hand, the overall R-squared is 0.6634, indicating a good explanation ability of the regression model. In general, the effective R-squared complements the deficiency of any possible chance that violates the results and the hypothesis.

The positive relation implies that distance between corporate borrowers and bank lenders do have an impact on borrowers' operating and reporting strategy, and as discussed in previous part, banks tend to monitor and put more control on corporate borrowers by requiring a higher

level of conservatism. The relatively large magnitude of coefficient is partly due to the use of natural log of distance, following the pattern in Hollander and Verriest (2016). The reason for using natural log of distance is to keep the magnitude of variables coherent, uniform and consistent.

As for the control variables, the most significant one is Market-to-Book value, which has a coefficient of 1.4308 and a p-value of 0.001. This ratio measures the current company value on the market comparing to its book value. Usually, when the market-to-book value is high, the company is thought to possess assets with better quality and have more growth options. Therefore, the positive coefficient of market-to-book value implies that the better assets company have, the more conservative the company would be. Such relation is consistent with Watts (2003a), which suggests that the use of conservatism can reduce agency costs efficiently, and Smith and Watts (1992), which find that there is a positive relation between growth options and agency costs.

Apart from market-to-book value, the leverage ratio also plays an important part in control variables, as it has a p-value of 0.017. Leverage ratio measures the level of debt within the company, and in most case, shareholders have more severe agency conflicts against the lenders for companies with a larger amount of debt (Khan and Watts, [2009]). However, in this thesis, there tends to be a negative relation between leverage ratio and conservatism. In Khan and Watts (2009), the relation between leverage and conservatism is also negative, with a coefficient of -0.017 and p-value of -3.61.

H2: The extent of accounting conservatism will be more pronounced among borrowers with less information transparency, such as firms with higher growing rate and profitability.

In hypothesis 2, it is expected to find the positive association on conservatism with Return on Assets, which captures how profitable a company's assets are in generating revenue, and revenue growth, which measures the growth rate of the company, respectively. However, the p-value and negative coefficient show that the higher profitability the company has, the less conservative it would be. A company's profitability ensures its solvency to a certain extent, and lenders would take this aspect into consideration when issuing the loan and monitoring the borrower afterwards. Previous research like Sun and Liu (2011) also shows similar negative

relation between ROA and conservatism. The insignificant p-value of revenue growth shows no persuasive evidence for hypothesis 2, either.

6.2. Analysis of accounting conservatism during the sample period

H3: the level of variability in accounting conservatism rises over time.

As discussed in previous part, this thesis adopts C_Score as a numeric measurement of accounting conservatism, which is set up in KW model. KW model not only captures the sensitivity of differential response of earnings to good news versus bad news but also take firm-year specific characteristics into consideration, making the result more explicit and reliable. Figure 1 puts the most representative value each year together, showing the change in accounting conservatism during the sample period of 4 years.

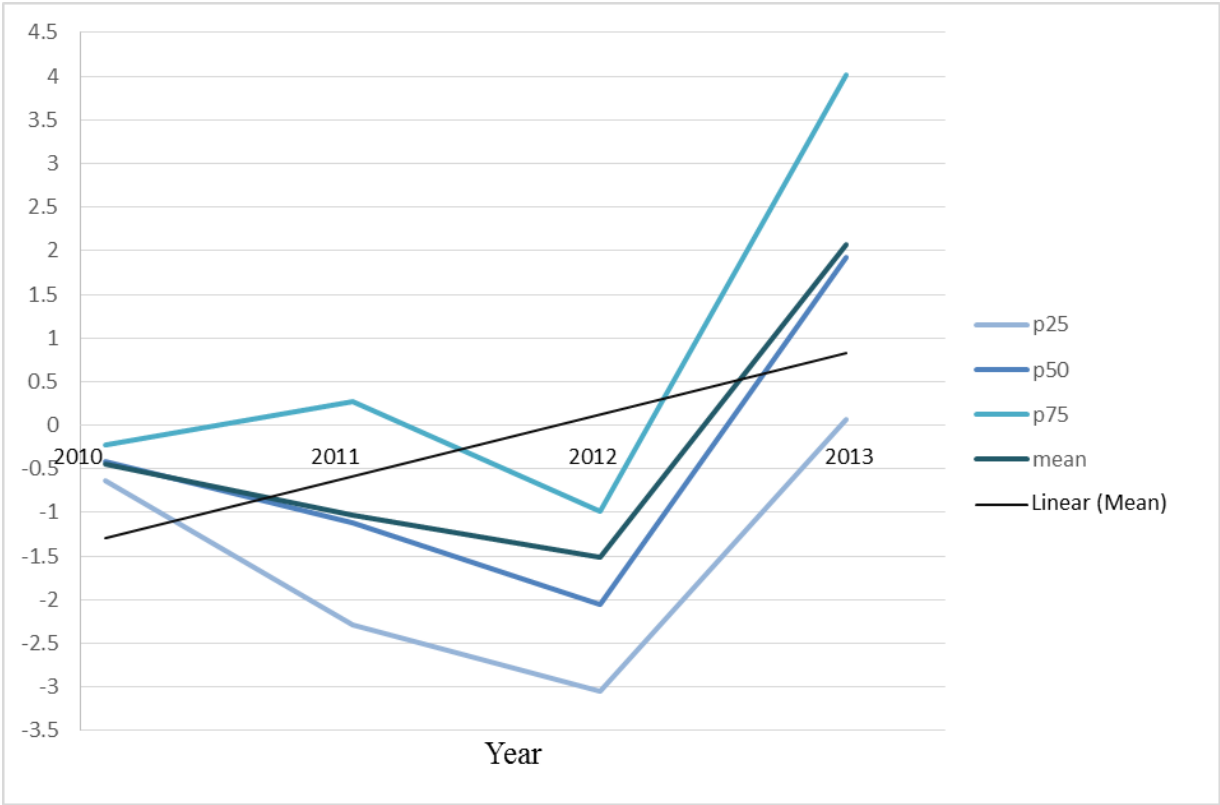


Figure 1. C_Score

For each year in this period, the trends of quartiles and mean follow the same pattern of decreasing from 2010 to 2012 while increasing starting from 2012, with the exception of p75, which slightly increase in 2010. The lowest value of conservatism shows up in 2012 and then it experiences rapid growth. In total, the value of conservatism fluctuates to some extent during

the years, and this is common for observations to have the value which is less than zero.

Table 8 includes the descriptive statistics of the C-Score which are sorted by firm year. The mean, standard deviation, median, minimum and maximum values of accounting conservatism each firm year are displayed to make the change more explicit.

Table 8. Descriptive statistics C-Score by firm year

	Obs	Mean	Std.Dev	Max	Min	p25	p50	p75
2010	695	-0.441235	0.690222	3.178879	-10.853590	-0.631034	-0.413588	-0.223219
2011	1,055	-1.028710	2.403389	18.036770	-18.763460	-2.293506	-1.115037	0.265727
2012	776	-1.517292	2.989676	17.698890	-17.670860	-3.055800	-2.055891	-0.992249
2013	777	2.074017	3.022599	12.809950	-10.358090	0.060092	1.922143	4.009126
Total	3,303	-0.289995	2.834966	18.036770	-18.763460	-1.922333	-0.562166	0.670992

Table 8 includes the descriptive statistics of the C-Score which are sorted by firm year. The sample comes from DealScan and the detailed definition and procedure should be found in section 5. C_Score is calculated using the method in Khan and Watts (2009), and the computation step should be found in section 4. This thesis uses STATA to generate these statistics.

C_Score has a mean of -0.29 and median of -0.56, and the standard deviation is 2.83. When comparing the maximum and minimum value to its first (p25), second (median) and third (p75) quartile, the difference is significant. However, the gap between the first and third quartile is far less than the difference between the maximum and minimum value, showing the existence of extreme values. Such feature also shows up in observations per firm year, suggesting that there are companies who are more or less conservative than others. The reason can be concluded as two aspects: one is the measurement of C_Score as an estimation of conservatism, which contains few firm characteristics that vary from year to year; another is that accounting conservatism itself is affected by various outside factors, such as regulations and requirements from auditors.

The increase in standard deviation suggests that the degree of fluctuation varies across years. 2010 has the smallest standard deviation while 2013 has the largest. Together with the change in gap, the volatility of conservatism tends to grow over time. Considering IASB and FASB excluded conservatism in Conceptual Framework for Preparation and Presentation of

Financial Statements in 2010, companies then are given more freedom to determine whether adopting accounting conservatism and to what degree. Hence, after 2010, new methods and reporting strategy were being adopted, so conservatism of firms experienced a period of changing, considering adjustments take some time before applying and going into effect.

Other reasons can also lead to the change in conservatism, for example, the sample selection procedure. Because the main purpose of this thesis is to study the relation between distance, which stands for monitoring ability, and accounting conservatism, the sample selection is based on the principle that companies should have borrowed from banks, and such loan records should be available in the database. In other words, companies used to measure conservatism by C_Score are ‘biased’ because they share the same feature of ‘borrower in the period of 2010 to 2013’, which can affect their behaviour and outsiders’ actions. Under the circumstances, it is likely that accounting conservatism of this sample varies from the general trends of the whole market.

6.3. Insights of distance and locations

(All the figures in this section should be found in Appendix C, at the end of the thesis.)

[Figure 2. HERE]

Figure 2 shows an overview of how corporate borrowers distribute over U.S during four years, starting from 2010. Obviously, the eastern part lays more companies, especially along the East coast of the United States, probably because of the existence of the major commercial cities and development of trades and business at high speed. When moving to the middle and western part of the United States, there is a significant decrease in the number of companies and, among those regions, Middle West is the emptiest. However, companies tend to gather again when approaching to the West coast, mainly in several big cities like Los Angeles and San Jose, which can be explained in conjunction with the similar phenomenon at the other side accordingly.

[Figure 3. HERE]

Figure 3 reveals the vertical comparison of borrowers distribution in this period, as a complement to Figure 1. In general, there is no significant change between years, and every year in this period turns out to be following the similar pattern: overall, the number of

companies decrease gradually from east to west, and corporations on the right portion are more concentrated while on the other side are more dispersed.

As for bank lenders, there is an even distribution of locations compared to corporate borrowers, and the number of banks is far less than borrowers. The reason for such phenomenon is large commercial banks have the ability to issue several large loans at the same time, and the total amount of banks is much less than listed companies. On the other hand, due to the financial crisis in 2008, banks in the United States suffered from the economic depression and faced tighter regulation. The crisis led to many bankruptcies, and some banks are still recovering from the huge losses. Moreover, many small banks were acquired and merged into larger ones, so their loans were also taken over.

[Figure 4. HERE]

[Figure 5. HERE]

Figure 4 and figure 5 present the distribution characteristics of bank locations altogether and per year, respectively. They are in accordance with the pattern of borrowers, showing the feature that eastern part and the West coast are the most common places for commercial activities in the United States.

[Figure 6. HERE]

Figure 6 put corporate borrowers and lenders together to give a more intuitive understanding per year. It is clear that banks usually locate at (or near) the cluster centres of borrowers, which can make them serving a larger number of companies. Unlike corporate borrowers, banks are more likely to locate in the major cities since it is more convenient to access other places and information spread speed would be faster, while some companies choose to stay in rural areas. The coverage area of banks also become larger from east to west.

Overall, there is a close relation between corporate borrowers and bank lenders in geographic distance. Most of them choose to locate themselves in the eastern part of the United States and mainly at large cities, and some prefer places along the sea. Also, there is no significant change during the sample period, showing that such circumstance is relatively stable over recent years.

The findings from geographic distribution reveal another interesting fact as well: despite high technology has been developing rapidly and people are more and more relying on the

Internet to gain, collect and exchange information, the physical locations are still of great importance and concern. Considering the continuous growth of new technologies, the strong physical bond may be weakened to some extent but remain at a significant place. E-commerce is not so much a replacement of traditional business but more a complement.

7. Conclusion

This thesis examines whether debt-holders' monitoring ability positively affects borrowers' accounting conservatism, and uses geographic distance as the approximation of monitoring ability. To capture accounting conservatism, this thesis adopts the method of C_Score in KW model (2009), and retrieves location information and distance from multi-approach, including database and manual collection.

The sample in this thesis include 3,344 firm-year observations from DealScan over the period of 2010 to 2013. In order to show relation between distance and conservatism, this thesis discusses the change in locations of borrowers and lenders respectively, and employs a robust method of using two-way fixed effects model to control for the individual effects and time effects in panel data. The result shows that there is a positive relation between geographic distance and accounting conservatism after controlling for various company features, indicating that lenders' monitoring ability does have impact on borrowers' conservatism.

The findings provide implications and evidence for debt contracting theory in Basu (2003a), which discusses the conflicts between shareholders and debt-holders and the existence of agency problem. Larger distance between lenders and borrowers erodes lenders' ability of information collection and reaction on a timely basis. Results in this thesis show evidence that distanced bank lenders monitor the corporate borrowers by requiring a higher level of conservatism to protect their own interests.

At the same time, limitations do exist in this thesis, such as the influence from regulation change and the development of high technology. Usually, the extent of accounting conservatism is an integrated result of various inside and outside factors, which changes overtime and does not follow a certain rule or pattern. Furthermore, the issue of different measurements of accounting conservatism has been going on for decades, and there is no general agreement of which way is the best. Besides, few prior study has looked into the monitoring-conservatism relation from the distance perspective, so the result of this thesis lacks comparative evaluations.

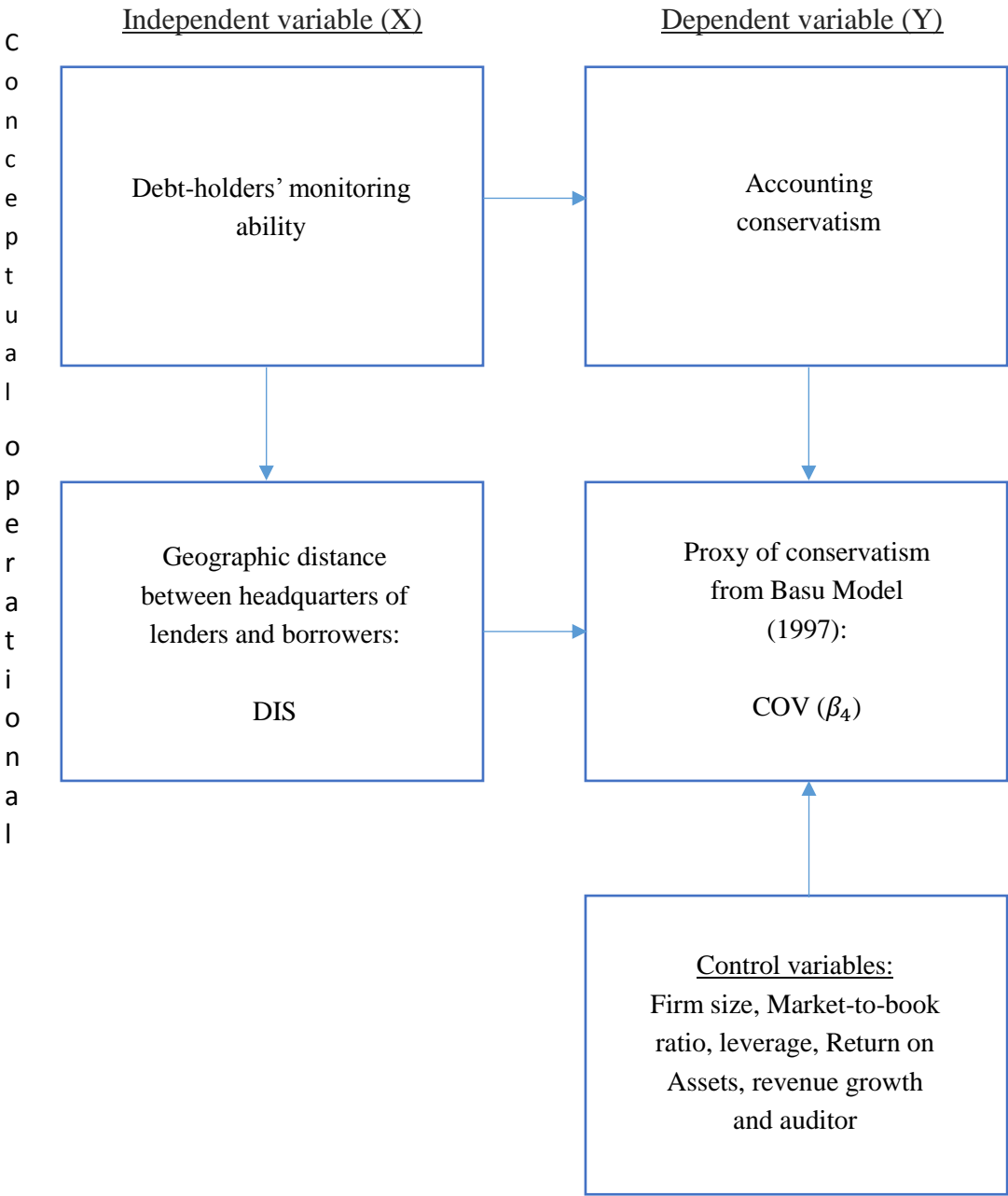
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Appendix A. Libby Box



Appendix B. Distance computation formula

Source: MapInfo – MapX (ActiveX)

For every two locations:

	Longitude	Latitude
Location 1	X_1	Y_1
Location 2	X_2	Y_2

Step 1: $\text{LongiRate} = \text{Cos}((Y_1+Y_2)/(2*\text{Arc2Degree}))$

Step 2: $\text{DeltaLongitude} = (X_1-X_2) * \text{LongiDegree2Length} * \text{LongiRate}$

Step 3: $\text{DeltaLatitude} = (Y_1-Y_2) * \text{LatiDegree2Length}$

Step 4: $\text{DIS (m)} = \text{Sqrt}(\text{Sqr}(\text{DeltaLongitude})+\text{Sqr}(\text{DeltaLatitude}))$

Where:

$\text{Pi}=3.1415926535897932385;$

$\text{Arc2Degree}=57.295779513082321;$

$\text{LongiDegree2Length} = \text{Pi} * 6,378.2 * 1000 / 180 = 111320.590351;$

$\text{LatiDegree2Length} = \text{Pi} * 6,356.8 * 1000 / 180 = 110947.089891$

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Figure 2. Overview of borrowers

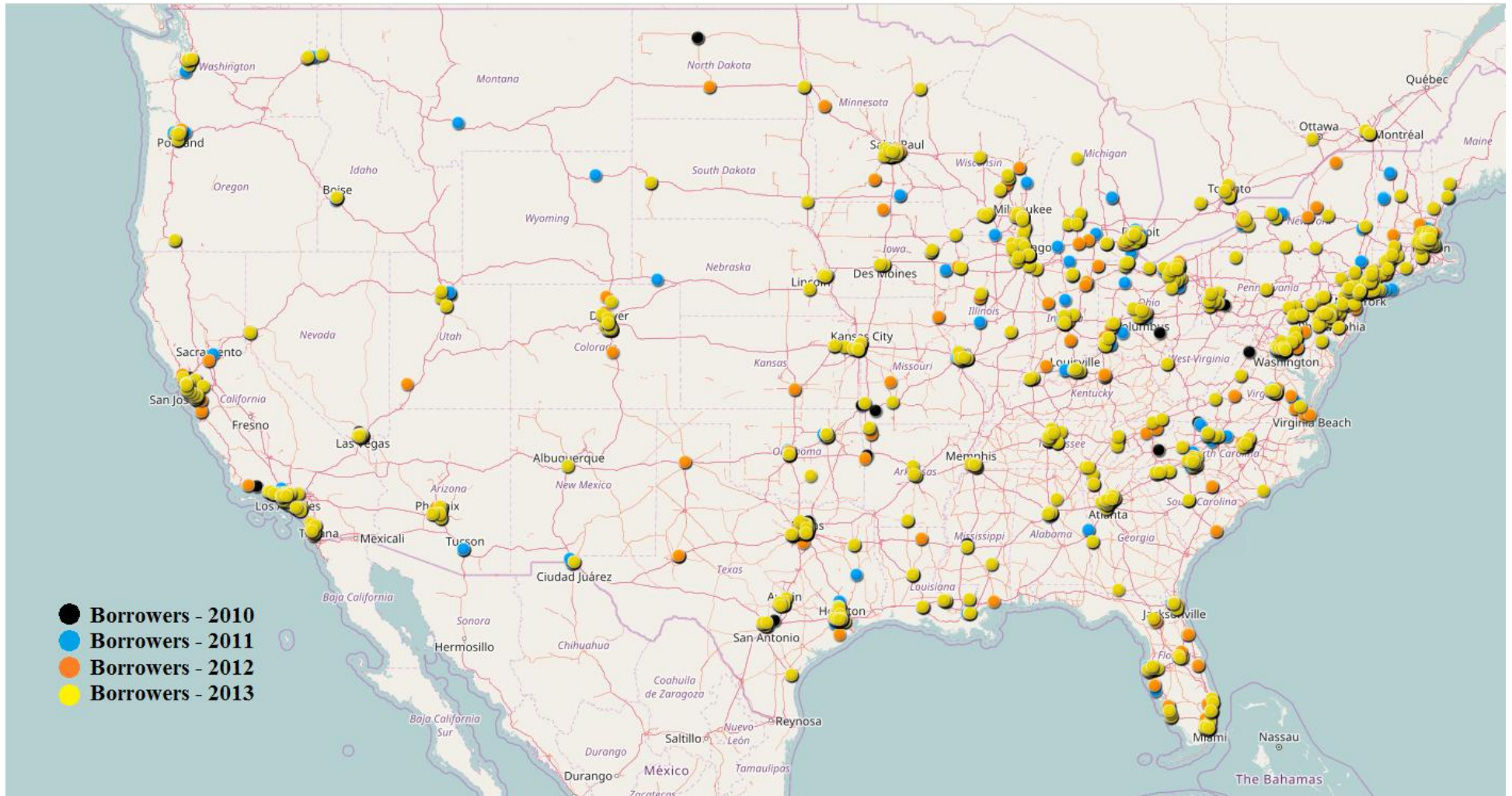


Figure 3. Borrowers in each year

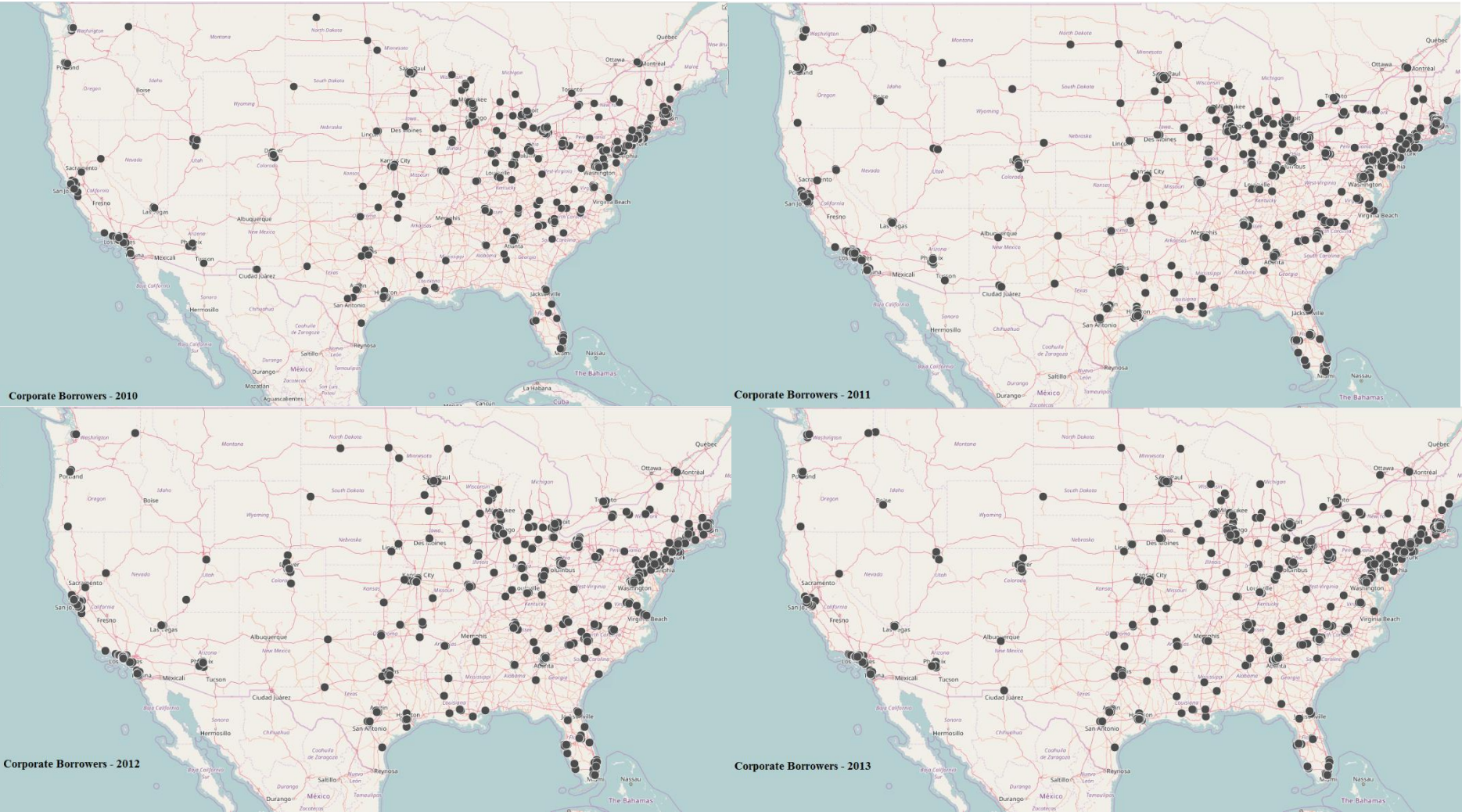


Figure 4. Overview of bank lenders

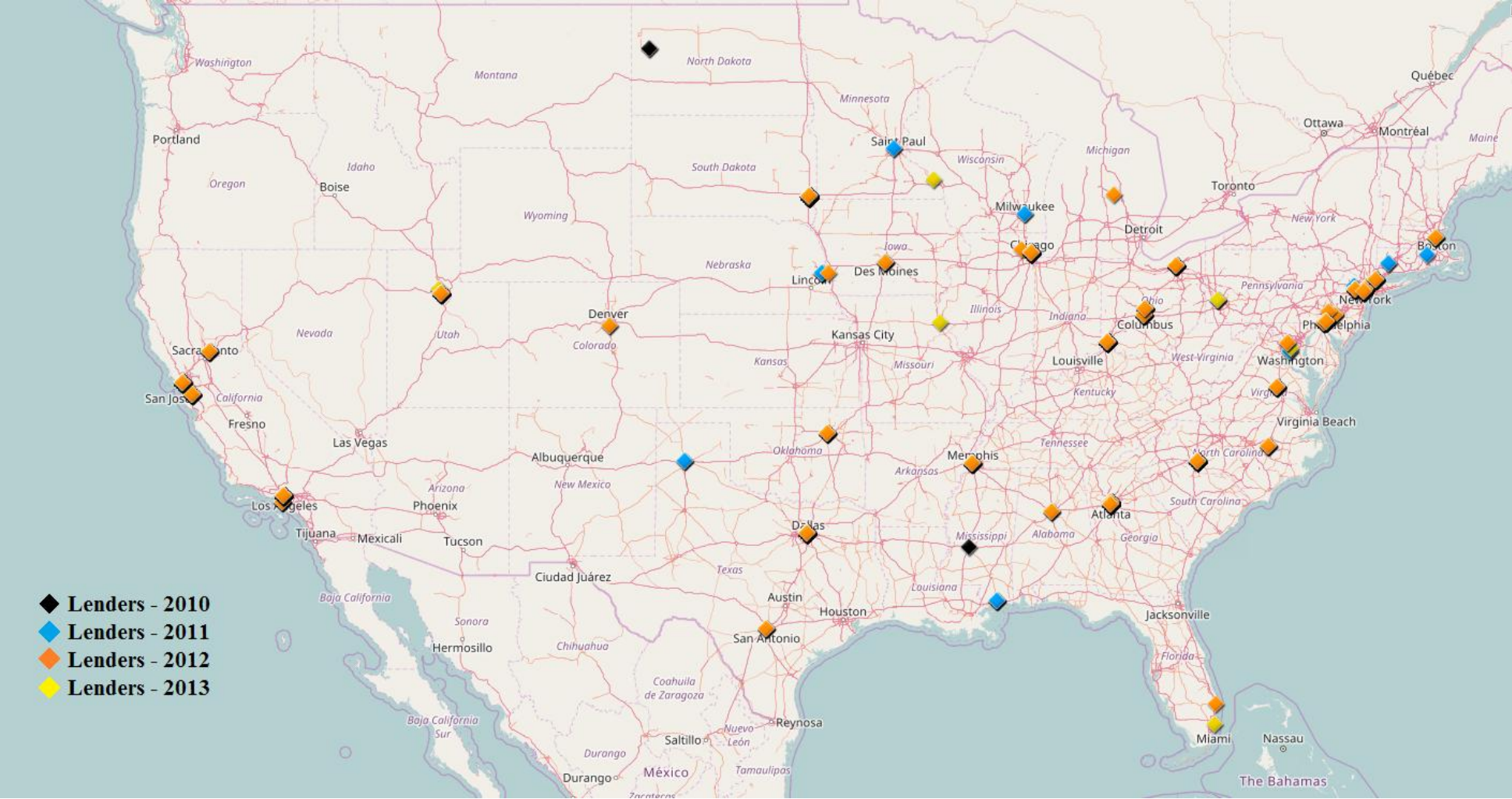


Figure 5. Lenders in each year



Figure 6. Borrower-Lender Location per year

