Loan Officer Confidence, Continuous Reporting, And The Loan Approval Process

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ABSTRACT

This study explores the issue of loan officers' confidence in making loan approval decisions across different loan monitoring types. Loan officers were asked to assign loan approval probabilities given a traditional loan monitoring capability or a continuous reporting capability. We find that the higher the level of confidence the loan officer had in his/her loan approval decision, the higher the loan approval probability assigned to the loan application. However, that effect was not consistent across monitoring types (traditional vs. continuous reporting). Our results suggest that loan officer confidence only impacts the loan approval probabilities for the traditional monitoring cases. Confidence did not significantly influence loan approval probabilities for the continuous reporting cases; although, the loan approval probabilities for the continuous reporting, low confidence cases exceeded 50 percent.

Keywords: continuous reporting, commercial lending, confidence, continuous monitoring

INTRODUCTION

$\mathcal{T}$he private debt market is the primary source of external funds for most small and mid-sized firms. In a frictionless market, any firm with a positive net present value investment opportunity would receive the required funds (Petersen and Rajan 1994). Unfortunately, frictions such as information asymmetry prevent funds from flowing to some firms that have profitable investment opportunities. Implementing mechanisms that mitigate the existing frictions to a level necessary to secure financing is in the best interests of these small and mid-sized firms. One possible alternative is for firms to agree to provide additional information, ex-post, and to allow the commercial lender greater monitoring capabilities. A potential application of greater monitoring capabilities is continuous reporting (CR).

Simply stated, continuous reporting means "making digitized information available through electronic channels simultaneously with its creation," (Elliott 2002, pp. 140). With today's systems, many businesses are capturing transactions continuously, making continuous reporting of those transactions both possible and relatively easy (Alles et al. 2002). While the type of information is important, the timeliness of receiving the information is critical because information that arrives too late to affect a decision is virtually worthless (Demski 1980; Demski and Feltham 1976; Feltham 1972). CR is one viable method to ensure banks receive information about a firm's performance in a timely manner. This continuous reporting (monitoring) interaction between a bank and a borrower may provide the bank with sufficient information about a firm's affairs "so as to lower the cost and increase the availability of credit to mitigate" information asymmetries (Petersen and Rajan 1994).

Utilizing the Internet as the backbone, firms and commercial lenders could be connected. In such a CR environment, the velocity of communication between the borrower and the lender increases dramatically, allowing the lender to continuously monitor the financial condition of the borrower through evergreen financial statements and ratios generated from real-time accounting systems (Woodroof and Searcy 2001). CR should facilitate and accelerate the communication between the lender and the borrower regarding loan performance while the loan is outstanding, thus reducing the lender's uncertainty regarding the borrower's financial condition. Reducing uncertainty minimizes default risk, thereby allowing the lender to accept the loan, *ceteris paribus* (Palepu et al. 1997).

For CR to be successful in the commercial lending domain, loan officers would have to be confident in its ability to adequately monitor borrowers' financial condition. More specifically, if loan officers lack confidence in CR, we would not expect them to positively incorporate that monitoring tool in their loan approval decisions. This study explores the issue of loan officers' confidence and CR. We find that the higher the level of confidence the loan officer had in his/her loan approval decision, the higher the loan approval probability assigned to the loan application. However, that effect was not consistent across monitoring types (Traditional vs. CR). Our results suggest that loan officer confidence only impacts the loan approval probabilities for the traditional monitoring cases. Confidence did not significantly influence loan approval probabilities for the CR cases; although, the loan approval probabilities for the CR, low confidence cases exceeded 50 percent.

PRIOR RESEARCH AND RESEARCH QUESTION

To our knowledge, there is only one study that empirically examines the effect CR has on the commercial lending application process; Searcy et al. (2009). Searcy et al. (2009) conducts a web-based experiment with 66 U.S. loan officers examining the potential benefits of continuous reporting in the commercial debt market. The experiment is a 2 x 2 repeated measures design. The reporting frequency (traditional, CR)[1] and loan risk class (high, low) is administered between subjects. The banking relationship (new, existing) employs a within-subjects design. The case involves a medium-sized borrower seeking a $1,000,000 line of credit. The case provides background information and 26 facts the loan officers can use to make a loan approval decision (Beaulieu 1994; Blackwell et al. 1998; and Danos 1989). The 26 facts describe accounting (8), character (6), industry (7), and company-specific (5) issues consistent with Beaulieu (1994). The lenders repeat the experiment a second time under the assumption the loan packet is from an existing client, as opposed to a new client.

Searcy et al. (2009) find that those companies considered high risk have a significantly higher loan approval rate if the company is willing to provide CR information compared to those high risk companies providing only quarterly information (i.e., traditional reporting). The authors do not find any results for the companies considered low risk. The findings are consistent across both banking relationships. The participants are also asked to indicate their level of confidence in assigning the loan approval probability. On a seven-point scale, ranging from not confident (0) to very confident (6), the loan officers appeared confident in their loan approval decisions (4.36 for new clients and 4.96 for existing clients). Our study centers around that last point, confidence in the loan approval decision. We use the data from Searcy et al. (2009) to explore the question:

Research question: Does loan officer confidence influence the loan approval decisions?

Taylor (1975, p77) defines confidence in decisions as the "self-rated confidence in the correctness of the decision". Danos et al. (1989) indicate that early in the loan application process lenders have high-levels of confidence in their credit-granting decisions. The authors indicate that lenders attain that confidence based on general background information and highly summarized financial data. The authors also find that in most cases subsequent information processed by the lenders did not alter the initial loan approval judgment but only increased their confidence in the initial judgment. That finding is consistent with prior studies indicating confidence increasing with additional information; even though judgmental accuracy remains relatively stable (e.g., Oskamp 1965; Einhorn & Hogarth 1978). While the initial judgment may be accurate (Murphy and Winkler 1977), overconfidence in judgments could lead to dire consequences (e.g., loan losses). Russo and Schoemaker (1992) find that primary knowledge does reduce overconfidence to some degree, but does not eliminate it altogether. Searcy et al.'s (2009) experimental design precludes us from investigating overconfidence; however, the within subjects design will allow us to examine the change in confidence.[2]

RESULTS

Table 1 provides the demographic statistics. Since our interest is the interaction of confidence and monitoring type, we divided the sample data between low confidence and high confidence.[3] As shown in the table, most of the loan officers had high confidence in assigning a loan approval probability. The age of the loan officers range from 42.8 (Traditional, Low confidence cell) to 48.6 (CR, low confidence cell). The loan officers' bank experience range from 19.7 years (traditional, low confidence cell) to 23.0 years (traditional, high confidence cell).

The age and bank experience are similar to those found in other studies using commercial lenders (e.g., Wright and Davidson 2000).

Table 1
Demographic Information

Panel A: Number of commercial lenders per case

	High Confidence		Low Confidence			
	Number	%	Number	%	Total	%
Traditional reporting	28	42.4%	7	10.6%	35	53%
Continuous reporting	21	31.8%	10	15.2%	31	47%
Total	49	100%	17	100%	66	100%

Panel B: Demographic data

	High Confidence		Low Confidence		Total	
	Bank Exp	Age	Bank Exp	Age	Bank Exp	Age
Traditional reporting	23.0	47.8	19.7	42.8	22.3	46.8
Continuous reporting	22.5	46.8	21.8	48.6	22.1	47.0
Total	22.9	47.2	21.5	46.9	22.3	47.1

The response means and standard deviations are shown in Table 2. Based on reported means, the loan approvals for new clients are much higher when the loan officer has high confidence, regardless of monitoring type. However, the loan approval probability is above 50 percent for the low confidence/CR treatment indicating that the probability of loan approval for CR clients is greater than 50 percent even though the loan officers had low confidence in making the decision.

Table 2
Loan Approval Response Means for MONITORING by CONFIDENCE Interaction Cells
(New Client)

CONFIDENCE		Low Confidence mean (std dev)	High Confidence mean (std dev)
	Traditional (TRAD)	31.42 (18.86) Cell 1	59.82 (32.25) Cell 2
MONITORING	Continuous reporting (CR)	53.70 (22.24) Cell 3	63.90 (26.77) Cell 4

Two types of tests were used to investigate the statistical significance of the loan approval probabilities across the treatment cells, ANOVA and Contrasts. Table 3 reports the ANOVA results. The CONFIDENCE variable is significant (p-value 0.002) indicating that the higher the level of confidence the loan officer had in his/her decision, the higher the loan approval probability.

We are most interested in the MONITORING *CONFIDENCE interaction in the model. That interaction is significant (p-value 0.037) suggesting that loan approval probability is influenced by loan officer confidence. Figure 1 displays the relationship between loan officer confidence and monitoring type. The difference in means is greater for the low confidence condition (31.42-traditional vs. 53.70-CR) compared to the high confidence condition (59.82-traditional vs. 63.90-CR). Figure 1 suggests that the relationship between confidence and approval is not consistent across both monitoring types.

Table 3
Loan Approval Response 2 X 2 X 2 X 2 ANOVA Model

ANOVA Model[1] (Sample size of 66 observations):

Explanatory Variables and Interaction Terms	DF[2]	F statistic[3]	P-Value[4]	R-square[5]
MONITORING	1	8.28	0.005	
RISK	1	46.71	0.000	
CONFIDENCE	1	9.97	0.002	
BANK_EXP	1	0.83	0.366	
MONITORING *RISK	1	2.08	0.154	
MONITORING *CONFIDENCE	1	4.55	0.037	
Overall Model Statistics	6	10.62	0.000	0.519

[1] The Loan Approval Response Model contains four dichotomous explanatory variables with two-way interactions or relevance regressed on response variable APPROVE in an ANOVA Model. APPROVE is the probability of approval assigned to each loan case by the loan officer ranging from 0 to 100%. MONITORING is a dichotomous explanatory measure coded 1 if the loan officer is given information updated and audited on a daily basis (continuous reporting basis), and coded 0 if the loan officer is given annual audited financial information and (unaudited) quarterly reports on its compliance with the agreed-to debt covenants traditional (traditional reporting basis). RISK is a dichotomous explanatory variable coded 1 if the company is of high risk, and coded 0 otherwise. BANK_EXP is a dichotomous explanatory variable coded 1 if the loan officer has a high level of bank experience, and coded 0 otherwise. CONFIDENCE is a dichotomous explanatory variable coded 1 if the loan officer had a high level of confidence in his/her loan approval decision (loan officer assigned a confidence level of four or higher on a 7-point scale ranging from 0 to 6), 0 if the loan officer had a low or neutral level of confidence in his/her loan approval decision (confidence level of three or lower). MONITORING *RISK is an interaction term that tests whether the relationship between audit approval and RISK is consistent at all levels of AUDIT. The variable was included in the study by Searcy et al. (2009). MONITORING *CONFIDENCE is an interaction term that tests whether the impact confidence has on loan approval is consistent for both traditional and continuous reporting cases.

[2] DF are the degrees of freedom.

[3] F statistic tests how well the overall model and individual variables account for the response variable's behavior and are based on Type III, or partial sums of squares.

[4] P-Value is the probability of arriving at the F Statistic by chance occurrence.

[5] The R-square statistic measures the amount of variation in the response variable explained by the model. This statistic ranges from 0 to 1, with the larger the value the better the model's fit.

Figure 1
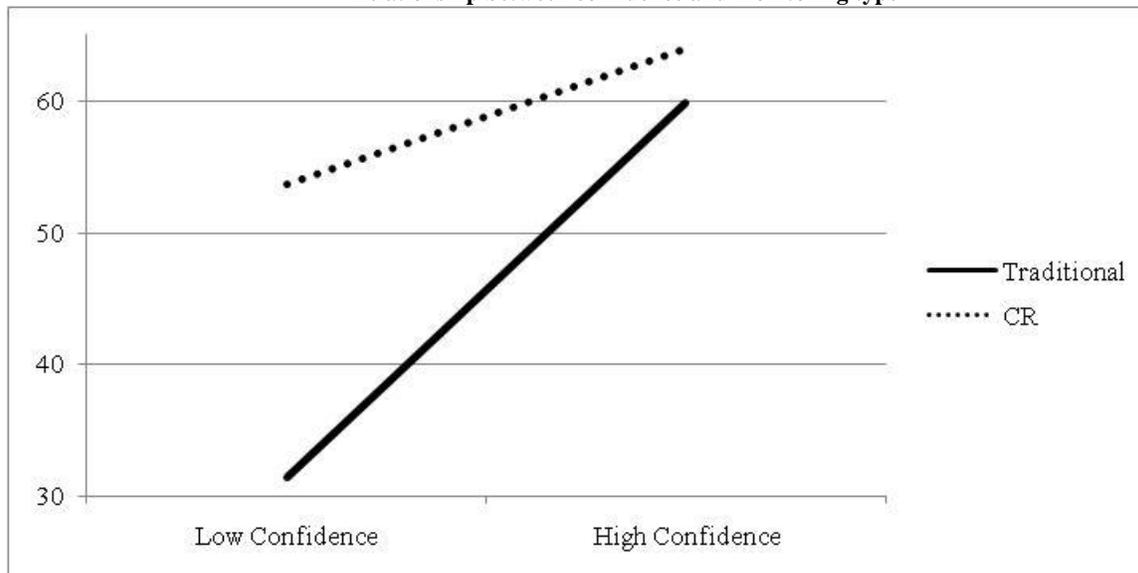**Relationship between confidence and monitoring type**

Table 4 displays the results of the contrasts confirming the significance of the mean differences. It appears confidence only impacts loan approval probability for the traditional treatment (p-value 0.019). In the CR treatment, confidence is not significant (p-value 0.348). The result is not too surprising given that the loan approval rate is somewhat high (> 53 percent) in the low confidence, CR cell.

Table 4
Planned Contrasts Results for Loan Approval Response (APPROVE):

	F stat	P Value[2]
Contrast of CONFIDENCE for traditional (1 -1 0 0):		
test of 31.42 vs. 59.82, with 1 degree of freedom	5.71	0.019
Contrast of CONFIDENCE for continuous reporting (0 0 1 -1):		
test of 53.70 vs. 63.90, with 1 degree of freedom	0.89	0.348

[2] One-tail p-value for direction testing.

We also ran separate ANOVA models to confirm the contrast results. As shown in Table 5, risk (p-value <0.001) and confidence (p-value 0.001) are highly significant in the traditional sample ANOVA model. Only risk is significant in the CR sample ANOVA model (p-value 0.001). Bank experience is not significant in either model.

Table 5
Loan Approval Response 2 X 2 X 2 ANOVA Model for Each Monitoring Type

I. ANOVA Model for only the Traditional Sample (Sample size of 35 observations):

[1]Explanatory Variables and Interaction Terms	DF^2	F statistic[3]	P-Value[4]	R-square[5]
RISK	1	33.55	0.000	
CONFIDENCE	1	13.04	0.001	
BANK_EXP	1	0.01	0.926	
Overall Model Statistics	3	15.20	0.000	0.595

I. ANOVA Model for only the Continuous Reporting Sample (Sample size of 31 observations):

Explanatory Variables and Interaction Terms	DF^2	F statistic[3]	P-Value[4]	R-square[5]
RISK	1	13.54	0.001	
CONFIDENCE	1	0.56	0.462	
BANK_EXP	1	1.46	0.237	
Overall Model Statistics	3	5.52	0.004	0.381

[1] All variables and test statistics were explained in Table 3.

The results so far have examined the variables assuming the loan application was from a new client. Searcy et al. (2009) have the loan officers make loan approval decisions considering the client is an existing client (five year relationship). The banking relationship variable is a within-subjects design. Table 6 presents the loan approval probabilities assigned by the loan officers for existing client loan applications. The cell assignments are unchanged from Table 2. In other words, if a loan officer is in Cell 1 on Table 2, then he/she is in Cell 1 on Table 6.

Table 6
Loan Approval Response Means for MONITORING by CONFIDENCE Interaction Cells
(Existing Relationship)

CONFIDENCE		Low Confidence mean (std dev)	High Confidence mean (std dev)
MONITORING	Traditional (TRAD)	54.29 (29.64) Cell 1	76.61 (26.67) Cell 2
	Continuous reporting (CR)	84.20 (7.94) Cell 3	85.19 (14.88) Cell 4

There are a couple of items worth noting. First, the loan approval probability in each cell is higher on Table 6 as compared to Table 2. The result is not surprising as there is an entire research stream on banking relationships that indicate that banking relationships are valuable and existing clients have a comparable advantage over new clients (Hooks 2003; Blackwell and Winters 1997; Shockley and Thakor 1997; Berger and Udell 1995; Petersen and Rajan 1994, 1995; Diamond 1991). Our interest is not in the within-subjects difference, but whether the differences between the cells are significant. Before examining cell differences, one other item is worth noting on Table 6. All cells show loan approval probabilities higher than 50 percent, suggesting that, even with low confidence, loan officers are more likely than not to approve a loan application for an existing client.

Searcy et al. (2009) also have the loan officers indicate their confidence in assigning a loan approval probability for the existing client case. Table 7 displays the mean confidence levels for both conditions (new client, existing client). Panel A reports the confidence means for the cells reported on Table 2.

Table 7
Loan Officer Confidence Means

Panel A: Existing Relationship—Table 2

CONFIDENCE		Low Confidence mean (std dev)	High Confidence mean (std dev)
MONITORING	Traditional (TRAD)	1.86 (1.07) Cell 1	5.32 (0.61) Cell 2
	Continuous reporting (CR)	1.60 (1.17) Cell 3	5.19 (0.75) Cell 4

Panel B: New Relationship—Table 6

CONFIDENCE		Low Confidence mean (std de)	High Confidence mean (std dev)
MONITORING	Traditional (TRAD)	4.00 (1.15) Cell 1	5.21 (0.88) Cell 2
	Continuous reporting (CR)	3.80 (1.81) Cell 3	5.48 (0.51) Cell 4

Low confidence cells have a mean confidence below 2.0, while high confidence cells report a mean confidence above 5.0. Notice in Panel B a low confidence condition really does not exist. The lowest confidence mean is 3.8 (Cell 3).[4] It appears the presence of a banking relationship greatly improves loan officers' confidence in assigning loan approval probabilities, regardless of monitoring type.

CONCLUSION

Based on the ANOVA models and the contrasts results, it appears the higher the loan officers' confidence, the higher they higher loan approval probability assigned for those loan applications offering traditional monitoring. Loan officers' confidence does not have the same effect with loan applications offering continuous reporting. However, even with low confidence, loan officers assigned a relative high loan approval probability to CR loan applications. For CR advocates, this study lends some support that firms implementing CR technology have a better chance to securing a bank loan as compared to firms that offer only traditional monitoring capabilities. On the other hand, the benefits of CR may diminish once a firm establishes a relationship with a lending institution. Since this study was exploratory in nature, care must be taken in interpreting the results. Further empirical studies are needed examining the potential of CR in the commercial lending environment, in general, and the effect of loan officers' confidence in CR technology has on the lending decision, specifically.

ENDNOTES

1. The participants in the traditional manipulation were told the borrower would provide the bank "annual audited financial statements and (unaudited) quarterly reports on its compliance with agreed-to debt covenants." The participants in the CR manipulation were told the borrower would provide the bank "financial information updated on a daily basis and accessed via CaneCorp's web site for determining compliance with agreed-to debt covenants."
2. The loan officers evaluated the loan application assuming the application is from a new client. The case was repeated under the assumption the loan application was from an existing client. The banking relationship was the only change between the two cases. Loan officers' confidences were collected for both cases.
3. CONFIDENCE is a dichotomous explanatory variable coded 1 if the loan officer had a high level of confidence in his/her loan approval decision (loan officer assigned a confidence level of four or higher on a 7-point scale ranging from 0 to 6), 0 if the loan officer had a low or neutral level of confidence in his/her loan approval decision (confidence level of three or lower).
4. We use 4.0 and higher on the confidence scale to indicate high confidence.

AUTHOR INFORMATION

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