

Relationship lending and the role of loan officers in China: Empirical analysis based on the data on companies in industrial clusters

Cheng Zhang¹, Yu Liu^{2*}, Cheng Tang³

^{1,2}Shantou University; yliu@stu.edu.cn (Y.L.).

³Economics Chuo University.

Abstract: Relationship lending refers to lending behavior in which a financial institution makes loan decisions based on the accumulated soft information on the borrower. Empirical studies have revealed the positive effect of relationship lending. However, questions concerning who generates and accumulates soft information and in what ways in China have never been analyzed empirically. This paper empirically aims to explain whether loan officers generate soft information in relationship lending using data collected through surveys conducted among SMEs in the apparel industry clusters in Zhejiang and Jiangsu provinces. Based on the results of this study, relationship banking in China, which deals with the role of loan officers, seems even more important than is generally recognized.

Keywords: Relationship lending, Small-and medium-sized enterprises, Soft information.

1. Introduction

A vast amount of research on relationship banking—or relationship lending—accumulated since the 1990s shows the importance of this business model (e.g., positive impact on lending). For example, Boot (2000), known for corporate finance research, argues that relationship banking is the best approach to solving information asymmetry to ease the credit constraints of small and medium-sized enterprises (Beatriz et al., 2018). Similarly, to limit or incentivize managers to use loan loss reserves (LLPs), regulators should consider adopting this prudential supervision mechanism in corporate governance in order to address information asymmetry (Pinto, 2020).

Of the few previous studies on the role of loan officers, Scott (2006) suggests that financing could worsen when the loan officer changes. Garica-Appendini (2007) pointed out that soft information becomes critical when a bank and company have a close business relationship. Based on the importance of using soft information, The study by Berger and Black (2011) indicated that smaller financial institutions tend to emphasize relationship lending. With the progress of information technology, banks should not cancel the relationship banking business because the relationship bank can cultivate close ties with bank customers (Jakšič and Marinč, 2017). Although relationship lending has nothing to do with credit constraints during the credit boom, it can alleviate them during an economic downturn (Beck et al., 2018). Credit plays a vital role in the loan relationship. The same bank's repeated borrowing reduces information asymmetry and thus reduces loan cost (Zhao, 2020).

Thus, using a survey conducted among SMEs located in the apparel industry clusters in the Zhejiang and Jiangsu provinces, this paper demonstrates empirically whether loan officers are playing a role in producing soft information under relationship lending in China and sheds light on our understanding of the role of loan officer in concrete terms.¹ There are two critical issues this paper hopes to address. First, what is the financing behavior of loan officers, and do they play an essential role as generators of soft information for companies? Second, once we establish that loan officers are crucial and

¹This type of analysis method is based on Uchida, Udell, and Yamori (2012).

the soft information they generate has a positive effect on relationship lending, we can say that relationship lending has its merit.

Considering these two objectives, I will review previous studies on loan officers in Section 2 to show that this paper is the first empirical study on China. In Section 3, I will propose two hypotheses for the empirical study, provide an overview of the individual company data used in this paper, and analyze independent variables and descriptive statistics. In Section 4, I will conduct empirical analyses of those two hypotheses to explain the role of loan officers in China. Finally, I will summarize the main findings of this paper in Section 5 and describe future research tasks.

2. Hypotheses and Descriptive Analysis of the Data

Thus, to test whether the role of loan officers as described above leads to the theoretical outcome, we surveyed the textile industry clusters in China between February and April of 2012 (from now on, referred to as the “2012 Survey”). It is an independent face-to-face survey covering 157 companies in the cotton-spinning-related industry in regions located in the Zhejiang and Jiangsu provinces. Notably, in addition to collecting “hard information” (e.g., financial data) on the companies, the 2012 Survey also asked a wide range of questions relating to the activities of loan officer, soft information (attributes on the company and the business operator), business relationship with financial institutions, company’s business challenges, initiatives for innovation, and desired government policies. This paper will focus mainly on the role of loan officers in relationship lending based on individual company data we collected during the survey. Since a similar survey (albeit with slightly different questions) was also conducted in 2010 and 2011, we know the quality of the 2012 survey is reliable because its findings are consistent with the previous two years’ surveys.

Given that soft information is considered necessary in relationship lending, as described above, we propose the following two hypotheses regarding the role of loan officers. The first (Hypothesis 1) is that loan officers are essential in generating soft information in relationship lending. For this hypothesis, we will use our company survey data to explain loan officers’ activities while generating soft information and verifying their role. It is represented by Equation (1) as follows:

$$\text{Amount of soft information} = f(\text{Characteristic and activities of the loan officer, strength of the relationship, control variable}) \quad (1)$$

In other words, the dependent variable in Hypothesis 1 is soft information (SOFT). Independent variables include the loan officer’s characteristics and activities to produce soft information, various variables to represent the strength of the relationship, the variables to remove the complex information on the company, and different control variables to represent the company’s characteristics.

The following hypothesis (Hypothesis 2) is that if soft information is accumulated, it must benefit a company through loan officers’ role in obtaining financing. It is expressed in Equation (2) as follows: Benefit of the relationship = g (amount of soft information, control variables) (2)

In other words, the dependent variable of Hypothesis 2 is the benefit of the relationship. As independent variables, the equation uses soft information (SOFT), the dependent variable in Hypothesis 1, and various variables to represent the strength of the relationship and various control variables that represent the company’s characteristics.

Under these two hypotheses, the important thing is how to measure soft information (SOFT). Following Scott (2004) and Uchida, Udell, and Yamori (2012), we prepared six questions to have companies rate how well the financial institutions know about them. The six questions are: 1) whether they know your company, 2) whether they know your company’s management team and owner, 3) whether they know the industry your company belongs to, 4) whether they know the market your company is involved in, 5) whether they know the local community your company belongs to, and 6) the frequency of daily contact between your company and the loan officer. We decided to use the responses to each question based on a five-point scale, where 1 means “doesn’t know at all” and 5 means “knows very well” to perform the principal component analysis and create variables for soft information.²

²Such a verification method is based on Uchida, Udell, and Yamori (2012).

Table 1 shows the percentages of how each company rated the six items based on a five-point scale. According to the table, the most chosen rating category was 3 (knows) for all items, except for Item 5; in general, many companies rated financial institutions as 3 or 4. Furthermore, among the six items, Item 1 had the highest mean score of 3.43, whereas Item 4 had the lowest mean score of 3.04. The first principal component obtained from the principal component analysis using the rating scores for the six items described above is the soft information (SOFT) dependent variable.³

Table 1.
Items for companies to rate financial institutions.

Rating Items	1. Doesn't know at all	2. Doesn't know well	3. Knows	4. Knows well	5. Knows very well	Total (Mean)
1) Knows your company	2.3	13.2	36.4	35.7	12.4	100% (3.43)
2) Knows your company's owner and management team	1.6	18.6	41.1	26.4	12.4	100% (3.29)
3) Knows your company's industry	1.6	22.5	41.1	14.0	20.9	100% (3.30)
4) Knows the markets related to your company	1.6	26.4	41.9	27.1	3.1	100% (3.04)
5) Knows the local community your company belongs to	3.1	17.1	33.3	39.5	7.0	100% (3.30)
6) Frequency of daily contact between your company and the loan officer	0.8	14.7	48.8	28.7	7.0	100% (3.26)

Note: Sample size =129.

Table 2.
Business activities and relationship with the loan officer.

	Choices	Sample size (Companies)	Percentage (%)
Replacement of the loan officer	None	104	75.4
	Once	24	17.4
	Twice or more	10	7.3
	Total	138	100.0
Age of the loan officer	In his/her 20s	18	13.1
	In his/her 30s	88	64.2
	In his/her 40s or older	31	22.6
	Total	137	100.0
Meeting place	At the company	44	32.4
	At the bank	90	66.2
	Other	2	1.5
	Total	136	100.0
Contact method	Meet in person	54	39.4

³In addition, we have created dummy variables, which were assigned the value of 1 when the response was "Quite excellent," and we performed the principal component analysis using those six dummy variables to create the dependent variable SOFT2 by using the first principal component obtained as a result. However, given that SOFT produced more results with better quality, we have determined to proceed with the analysis by using SOFT as the dependent variable.

	Telephone	79	57.7
	E-mail, etc.	4	2.9
	Total	137	100.0
Temporal distance to meet	5 minutes or less	43	34.1
	6 to 10 minutes	48	38.1
	More than 10 minutes	33	26.2
	Total	126	100.0

Next, the variables given below are used as independent variables. First, the following variables related to the characteristics and activities of the loan officer could come to mind as variables that affect the officer's production and accumulation of soft information. In other words, the loan officer-replacement dummy variable can indicate that the loan officer was never replaced in the past two years (replacement = 1 and no replacement = 0; however, the coding was reversed at the time of analysis).⁴ Theoretically, the variable is expected to have a positive sign about SOFT, given that the amount of information generated would increase when no loan officer replacement occurs.

Another is the age group dummy variable (in his/her 30s = 1), representing the loan officer's experience. The variable is expected to be positive, given that those in a younger age group are generally less knowledgeable and experienced with various aspects of their clients. In contrast, those in their 40s or older have a more decadent collection of soft information on their clients. However, Uchida, Udell, and Yamori (2012) pointed out that the sign is unclear because younger loan officers might visit their clients more frequently and strive to collect soft information.

The questionnaire also asks about the frequency of contact with the bank and how many times they meet each other per month or year. With the dummy variable for the place for meeting the loan officer (at the company = 1, at the bank = 0), having the loan officer visit the company in person rather than meeting at the bank is probably a plus for generating soft information. As for the most frequently used contact method (in-person = 1, telephone, fax, QQ, etc. = 0), in-person communication should have a better effect on generating soft information than telecommunication.

As described above, the loan officer's characteristics and activities are shown in Table 1. Based on the table, loan officers were not replaced in approximately 75.4% of all cases. In contrast, the instances of one-time replacement accounted for 17.4%, and the cases with twice or more replacements accounted for only 7.3%. In the case of China, a system to rotate personnel every two to three years, similar to the one found in Japan, is rarely seen, and there is usually a system in which loan officers are held accountable until their financing projects are entirely paid off.⁵ As for the age group of loan officers, those in their 20s and 30s account for 13.1% and 64.2%, respectively, for a total of 77.3%. In addition, 66.2% meet at the bank, 57.7% use the telephone, and 39.4% meet in person regarding contact methods. In addition, we can see that 72.3% of the bank's locations are within a 10-minute drive, regarding the temporal distance between the company and the bank. It is probably attributable to the fact that many of the companies we studied are located in the suburbs or rural areas.

Table 3.
Descriptive statistics.

	Sample Size (Companies)	Mean	SD	Min.	Max.
(1) Company and operator attributes					
Age of the company (Years)	144	9.514	5.238	2	26
Capital (10,000 yuan)	141	549.175	1407.424	15	10000
Management tenure of the CEO (Years)	144	7.951	4.891	1	24

The interval based on which the loan officer is rotated probably differs by bank; however, given that the interviews we conducted indicated ⁴ that loan officers at commercial banks are sometimes transferred and replaced every two to three years, we use the period of two years in this paper.

In many cases, compensation, such as bonuses for the loan officer, is dependent on the repayment status of the company (according to an ⁵ interview with a bank branch manager conducted by the authors in May 2015).

Number of employees (Individuals)	144	168.819	139.055	15	820
Asset size (10,000 yuan)	139	2441.424	4679.646	100	31061
(2) Main Variables					
Frequency of visit (Per year)	135	15.585	33.174	0	240
Distance (minutes)	126	10.901	8.886	1	80
Replacement of the loan officer (Times)	138	0.754	0.432	0	1
Age of the loan officer	137	0.774	0.420	0	1
Meeting place	136	0.324	0.470	0	1
Contact method	137	0.394	0.490	0	1
Number of banks financing the company	116	1.690	0.807	1	5
Longest relationship with a bank	136	4.390	3.089	1	23
Diversification of business	133	3.195	0.957	1	6

In addition, the frequency of financial statement submissions to the bank is categorized as (1) at least once a month, (2) once every three months, (3) once every six months, and (4) once a year. Here, the dummy variable is coded so that “(1) at least once a month” has the value of 1. It can be regarded as an essential control variable to remove complex information because we can say that a higher frequency in which the lender company submits financial statements to the bank implies that the bank is making such a demand to the lender company and monitoring the company’s financial situation carefully. Doing this increases the frequency of contact with the loan officer, thus helping produce soft information. With regards to variables representing the scale of the company, we asked for details about the size of capital, size of total assets, sales, number of employees, age of the company, and sales performance in the past two years, which is categorized into (1) consecutive surplus, (2) surplus to deficit, (3) deficit to surplus, and (4) consecutive deficit. Notably, the dummy variable assigns the value of 1 to “(1) consecutive surplus.”

As for the characteristics of the business operator, we asked for information about the operator’s tenure as a manager, educational background, and whether he/she is a founder. It is probably more accessible for the loan officer to collect soft information if the company has been in business for a while. A company’s creditworthiness should also be higher if the business operator is a founder who is better educated. However, these variables do not considerably affect the quantitative analysis because more than 90% of our surveyed companies’ business operators are founders, and more than 70% have an educational background of high school or less.

Finally, as a control variable, the temporal distance dummy variable (DISTANCE, within 10 minutes = 1, 10 minutes or more = 0) is used as an independent variable representing the strength of the relationship between the company and the bank.⁶ According to the relationship theory, the frequency of contact between an SME and their bank increases as the distance between them becomes shorter, making it easier for them to build a close relationship. For example, Alessandrini, Presbitero, and Zazzaro (2008) analyzed and found that the amount of funding the company provides increases as the relationship between the company and the bank becomes closer. As regards the number of banks from which a company receives loans, although we can expect the relationship to be more robust when there are fewer banks, the mean among SMEs remains at 1.69 banks, as shown in Table 2. The means in Japan and the United States have been reported as 4.1 to 4.2 (Ono and Uesugi, 2009) and 1.2 (Brick and Palia, 2007), respectively. In addition, the longer the company does business with their central bank, the stronger their relationship should become. Such analyses of the strength of the relationship have shown the significance of the length of the relationship in empirical studies, such as that by Tang (2012).

The diversity of business services also represents the strength of relationship lending because financial transactions include lending not only to companies but also to items such as settlement, wealth management product investment, and foreign currency procurement. Table 2 shows that the mean of a bank’s business services to the company is 3.1. However, as demonstrated by Tang (2012), it seems that banks often make companies redeposit or reinvest in wealth management products a portion of the loan

⁶ We have also asked about spatial distance.

financed by the bank. Thirty-eight companies, or 28.6% of our surveyed companies, used bank wealth management services. According to Ono and Uesugi (2009), the mean number of business services (excluding lending transactions) SMEs receive from their central bank is 4.2. We can say that SMEs in Japan conduct more diversified financial transactions with their banks.

3. Estimation Results

The estimation result for Hypothesis 1 is shown in Table 4. It results from analyzing a loan officer's role in accumulating soft information. Based on this, the result is positive and significant when the loan officer is not replaced. It implies that the amount of soft information produced increases when the same loan officer remains in charge of the lender company in the long term.

Table 4.
Information production and activities of the loan officer.

(Dependent variable = SOFT)	Coefficient	Standard error	p-value
Constant term	-6.348***	1.890	0.001
Tenure as CEO	0.046	0.028	0.105
Asset size (log)	2.919***	0.941	0.003
Frequency of visit	-0.005	0.004	0.235
Replacement of the loan officer (no = 0, one or more = 0)	0.758**	0.332	0.025
The age group of the loan officer (in his/her 30s = 1)			
In his/her 20s	0.534	0.413	0.202
In his/her 40s or older	0.232	0.327	0.944
Meeting place (at the company = 1; at the bank = 0)	0.046	0.300	0.988
Contact method (in person = 1; telephone, fax, QQ, etc. = 0)	-0.095	0.270	0.726
Frequency of financial statement submission (once a month or more = 1; once every three months or less = 0)	1.274***	0.301	0.000
Number of banks with loans	-0.563***	0.181	0.003
Regional bank (regional bank = 1; state-owned bank; commercial bank = 0)	0.369	0.263	0.163
Temporal distance (within 5 minutes = 1; more than 5 minutes = 0)	0.605**	0.269	0.027
Sample size	101		
Adjusted coefficient of determination	0.315		

Note: ***, **, and * indicate that the coefficient is significant at the 1%, 5%, and 10%, respectively.

The reference age group of the loan officer is “in his/her 30s,” and the dummy variables were not significant for “in his/her 20s” or “in his/her 40s or older,”

indicating that the collection of soft information is not associated with a loan officer's skill level. In addition, it became clear that factors such as meeting place and contact method were unrelated.

We consider the results for other main independent variables. The dummy variable for submitting financial statements at least once a month was positive and significant. It suggests that frequent submissions of financial statements by the company led the bank to understand the company's financial situation well and to increase the frequency of contact with the loan officer through visitation. In addition, the dummy variable of temporal distance was positive and significant, thus implying that the relationship becomes closer as the distance between the bank and the company becomes shorter. Furthermore, the number of banks the company does business with was negative and significant, thus suggesting that the relationship becomes weak because information on the borrowing company might not be sufficiently generated.

To sum up the above analysis results for Hypothesis 1, our study has confirmed the role played by loan officers in generating and accumulating soft information. The following analysis task tests Hypothesis 2 as to the significance of soft information. That is, if soft information is collected, it is necessary to demonstrate that it positively impacts obtaining funding. Here, the dependent variable representing the benefit of the relationship is the question item indicating the level of difficulty the company encounters while being evaluated for a loan. In particular, this question concerns the current screening process when they want a loan. We provided answer options, including (1) very strict, (2) slightly strict, (3) relatively easy, and (4) don't know (however, given that there were only several companies that said "don't know," (4) was excluded). Notably, among the valid sample of 134 companies, 35.8% (48 companies) chose (1), whereas 52.2% (70 companies) and 11.9% (16 companies) chose (2) and (3), respectively. Suppose soft information had a positive impact on relationship lending. In that case, companies should choose (3), or at least (2), in terms of the level of difficulty they encounter at the time of loan screening.

Given that the choices for this question are related to preference, we will measure the determinants of the benefit in procuring funding in Hypothesis 2 by using an ordinal choice model. In doing so, we will also add ordinal probit analysis, which has almost the same process. It aims to test the benefit of relationship lending by incorporating the amount of soft information used in Hypothesis 1 as an independent variable.⁷

The following estimation model is conceivable:

$$y^* = \beta x + \epsilon$$

(y^* : latent variable, x : independent variable, β : coefficient vector, and ϵ : error term)

Furthermore, observed independent variable y and latent variable y^* would have the following relationship based on the mechanism of threshold k_j :

$$1. \quad y = \begin{cases} 0 & \text{if } y^* \leq k_1 \\ 1 & \text{if } k_1 < y^* \leq k_2 \\ \vdots & \\ \vdots & \\ J & \text{if } k_{j-1} < y^* \end{cases}$$

The threshold and the coefficient vector that satisfy the above relationship are determined by least squares estimation. There are two thresholds, k_1 and k_2 , to be determined to satisfy $J = 3$ in this paper's case. If there are three answer choices for the independent variable at that time, the probability of choosing each option is expressed explicitly as follows:

$$P(y = 0|x) = 1 / (1 + \exp(-k_1 + \sum \beta x))$$

$$P(y = 1|x) = 1 / (1 + \exp(-k_2 + \sum \beta x)) - 1 / (1 + \exp(-k_1 + \sum \beta x))$$

$$P(y = 2|x) = 1 - 1 / (1 + \exp(-k_2 + \sum \beta x))$$

As for the estimation for the probit model, it can be described as follows: If the choice of the economic agent y_i^* is expressed as $y^* = \beta x + \epsilon$, y^* would be observable or would be a possible latent variable, and ϵ would be the error term. Given that y^* , in the case of the above equation, is unobservable, y is defined to meet the following conditions:

$$y = 0 \quad \text{if } y^* < 1$$

$$y = 1 \quad \text{if } y^* \geq 0$$

Assuming that ϵ follows a standard normal distribution, the parameter vector β is estimated.

⁷ We also used a dummy variable that coded only "(1) very strict" as 1 to indicate the level of difficulty encountered by a company at the time of obtaining a loan and then performed probit estimation (marginal effects); however, the results were almost the same.

Table 5.
Determinants for the level of difficulty in loan screening.

	Ordinal logit (1)		Ordinal probit (2)	
	Coefficient	z-value	Coefficient	z-value
Soft information	0.433***	2.82	0.252***	2.92
Tenure as CEO	-0.057	-1.62	-0.028	-1.51
Sales (Log)	-8.371**	-2.27	-4.781**	-2.32
Regional bank dummy	-0.002	-0.05	-0.035	-0.15
Years doing business with the main bank	0.235***	2.72	0.129***	2.74
Temporal distance	0.474	1.09	0.246	0.99
Frequency of financial statement submission	0.252	0.56	0.080	0.31
Two-year consecutive surplus dummy	-0.001	-0.21	-0.004	-0.21
Cut1	-5.849	2.489	-3.362	1.446
Cut2	-2.844	2.434	-1.619	1.425
Sample size	116		116	
LR chi2(8)	28.31		27.97	
Log-likelihood	-97.110		-97.282	
Pseudo R ²	0.127		0.126	

Note: ***, **, and * indicate that the coefficient is significant at the 1%, 5%, and 10% levels, respectively.

The results of the ordinal logit and ordinal probit estimations are shown in Table 5. First, Equation (1), in terms of the significance and sign of the parameters, such as the log of sales and years doing business with the main bank, are significant and generally agree with the predictions made before the estimation. In particular, the coefficient of soft information as an independent variable was positive and significant, as we expected, thus suggesting that the more soft information is accumulated, the more benefits the company enjoys when being screened for a loan. As the theory predicted, the number of years doing business with the main bank is also positive and significant. It suggests that the relationship becomes closer, resulting in a positive impact on financing as the number of years of business with the bank increases. However, the temporal distance dummy variable, which was significant in Table 5, is not significant despite being positive. We can see that the significant variables and their signs, as shown in the probit model results that used the same variables as Equation (1), generally agree between the equations.⁸

4. Conclusion

This paper empirically demonstrates whether bank loan officers play a role in generating and accumulating soft information when they perform financial transactions with SMEs. We used our survey data on companies, set two analytical goals, proposed two corresponding hypotheses, and tested them. The empirical results indicated that when a dedicated loan officer handles the same borrower long-term, he/she contributes somewhat to generating soft information. It also became clear that the soft information obtained by the loan officer provided benefits to the borrowing company because such information made funds easier to obtain and reduced funding restrictions.

Furthermore, the finding that the strength of the relationship had a positive effect on accumulating soft information and the actual lending was consistent with earlier studies by Hé (2010) and Tang (2012). Thus, our survey results demonstrated that the role of loan officers is essential in relationship lending in China, mainly when a loan officer continuously handles the same company on a long-term basis (defined as no replacement for two years). Conversely, the results suggested that the potential for a company to obtain funding becomes worse when the loan officer is replaced. It is also consistent with the results shown by Scott (2006).

We also performed probit estimation (marginal effects) by using the dummy variable that assigned the value of 1 to the answer “(1) very strict”⁸ relative to the question on the level of difficulty in obtaining a loan, which is the dependent variable in Hypothesis 2. The results also indicated that the coefficients representing the accumulation of soft information and the number of years doing business with the main bank also had negative effects at the 1% significance level.

Based on the analysis of this paper, the importance of relationship banking in China and the role of loan officers should be appreciated more than they currently are. That being said, this paper has not considered the following two questions. First, although the loan decision system to which loan officers belong may vary from bank to bank, the significance of the dummy variable that distinguished state-owned banks and regional commercial banks from local financial institutions (city commercial banks, village and township banks, trust and investment corporations, etc.) was not tested in this paper. Secondly, unlike Deng and Hé (2014), who have dealt with the personality and gender dimension of loan officers in their studies, this paper has left out the gender and personality in the loan decision-making process. It is essential to increase the sample size of banking organizations and conduct analyses based on more detailed classifications. In addition, if loan officers generate soft information, which has a positive lending effect on the borrowing company, as the analysis results in this paper suggested, it is probably necessary to clarify what banks' actual lending technology is based on.

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