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Effects of Monetary Incentives and Career Concerns on Quality of Bank Loans: Evidence from Branch Credit Committee of an Iranian Commercial Bank

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Abstract

According to the financial literature, the agency problem can affect bank loans when there is information asymmetry. In this regard, the contract between the bank and bank agents, who are involved in the lending process, is considered crucial along with monetary incentives. Career concerns and characteristics of bank agents can also affect these agents' performance, and effectiveness of the bank's monetary incentives. Based on the results of empirical and theoretical studies, the performance-based incentives or rewards (as opposed to lending-based incentives) and more career concerns of bank's agents leads to an increase in the quality of lending, albeit by reducing risk-taking leads to reduction in the lending measure (profitability) of the bank. This paper analyzes the effects of monetary incentives and career concerns on micro-loans quality. The effects of monetary incentives were analyzed by studying how the members of the branch credit committee of an Iranian commercial bank were compensated by the bank. In fact, this bank changed from a volume-based compensation system into a compensation system based on both "lending volume" and "performance". The paper also analyzes the impacts of career concerns on loan quality by considering the characteristics of branch credit committee's members. Since, on the one hand, the dependent variable (loan quality) is a discrete ordinal variable and on the other hand, based on the Brant test′s result the proportional odds assumption was violated, the generalized ordinal logit model was used. The results indicated that "performance-based incentives" improved micro-lending quality. The results also showed that branch credit committees with more women and youth people had higher micro-lending quality.

Keyword: Monetary Incentives, Career Concerns, Lending, Loan Officer, Micro-Lending Quality, Branch Credit Committee.

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1. Introduction

According to the financial literature, the agency problem can affect bank lending outcomes in the presence of information asymmetry. In other words, if a borrower's information is either "concealable" by the loan officer (or other bank agents) or "unverifiable" by the bank, the loan officer's monitoring and screening efforts will affect the lending outcomes.

In fact, there are reasons that may prevent the bank's agents in the lending process from doing their best to screen and monitor the borrower (see Udell 1989). According to Holmstrom (1979) and Shavell (1979), the conventional solution to the agency problem is to agree to an employment contract that aligns bank interests such as those of the principal, the loan officer, and the agent by making compensation contingency plans for ex-post outcomes. In this regard, some studies have examined the effect of monetary incentives and Career concerns of loan officer on lending outcomes.

Following these studies, this paper analyzes the effects of "changing the bank compensation system" and "replacement of retirees by young people in the BCC" on "quality of micro-lending" in an Iranian commercial bank. In fact, the studied bank has 2 unique features that have made this research possible; (1) in this bank until 2013 the compensation system for members of the BCCs was only based on lending volume but from the beginning of 2014 onward, their compensation system has been based on both "lending volume" and "performance". And (2) in the years under review, the members of the BCC are combination of "retirees" and "youth"; in fact this bank has been active for nearly 20 years and to start the banking business, it has employed retirees from older Iranian banks for important positions such as "branch manager", "assistant branch manager" and even "loan officer". According to the bank's plan, retired employee gradually dismiss after transferring their experiences to the bank's younger employees.

2. Literature Review

Agarwal and Wang (2009) tested the model predictions showing that incentive compensation (based on loan origination or lending volume) would increase loan origination but might induce the loan officers to book riskier loans. Also their findings indicated that loans was approved by older loan officers are higher risk than younger ones, due to more career concerns of young people compared to older ones.

Cole et al. (2015) analyzed the effects of variable compensation on loan officers' approval decisions. They conducted an experiment on loan officers at a commercial bank in India. According to their results, incentives that rewarded lending volume led to high acceptance rates, low efforts, and high default. By contrast, high-powered incentives were effective at generating efforts, leading loan officers to correctly identify and screen out bad loans, and raising the overall profitability of lending. They also concluded that "loan officers who are closer to retirement age" make less effort in the lending process.

Agarwal and Ben-David (2018) exploited a change in the compensation structure of a U.S. bank and showed that volume incentives led to greater risk-taking and deterioration in loan performance. They also explored the correlations between loan-officer characteristics and lending outcomes. They found that applications handled by more tenured loan officers and male loan officers were more likely to be approved; and the probability of default of their lending is more than that of their younger and women counterparts.

3. Theoretical Framework

This paper benefits from the theoretical framework proposed by Cole et al. (2015). Their simple theoretical framework highlights how changes in loan officer incentives affect screening behavior and lending decisions. Their model encompasses firms, loan officers, and the bank. Their theoretical framework and model predict five propositions, which 2 cases of them are related to the subject of this paper are: (1) An origination piece rate (lending-volume incentives) leads to low efforts, indiscriminate lending, and a high probability of default. By contrast, high-powered incentives based on lending performance lead to greater efforts, more conservative lending, and a lower probability of default. And (2) if a loan officer is motivated by career concerns, she/he will exert nonzero screening efforts in the absence of monetary incentives; thus, the screening effort decreases in age or distance to retirement.

4. Description of Data, Variables and Methodology

4.1. Data

The data used in this paper are 266320 micro-loans approved by BCCs of a commercial bank in Iran during the years 2011 to 2018.

4.2. The Variables

The dependent variable is the micro-loan quality, which is an ordinal variable with five levels (5= loans without overdue, 4= up to 2 months of overdue, 3= 2 to 6 months of overdue, 2= 6 to 18 months of overdue, and 1= more than 18 months of overdue). These five loan quality domains are hierarchically structured. This is a standard classification of loans in the Iranian banking system and is used in giving instructions for collecting overdue loans. Also,

there are four groups of explanatory variables: (1) loan specifications including amount, maturity, and interest rate; (2) borrower specifications including customer type, relationship history, type and value of collateral, and income; (3) characteristics of the BCC members including gender, age, education, and "being young or retired"; and (4) the compensation system.

4.1.4. Methodology

The dependent variable, *i.e.* loan quality, is an ordinal variable. The most well-known model for estimating an ordinal outcome variable is the ordered logistic regression model. In this model, the effect of each predictor is assumed to be equal across the categories of the ordinal dependent variables. This restriction is referred to as the proportional odds or the parallel lines assumption. If this assumption is violated, it is misleading and invalid to interpret ordered logistic regression model results. And the generalized logistic regression model should be used.

To address this issue, Fu (1998) and William (2006) developed the generalized ordinal logit model, which model relaxes the PO assumption by allowing the effect of each explanatory variable to vary across different cutoff points of the ordinal outcome variable. The generalized ordered logit model, for an ordinal dependent variable Y with M categories, as proposed by Fu (1998) and Williams (2006), can be written as follows:

(1)

$$P(Y_i > j) = g\left(\boldsymbol{X_i\beta_j}\right) = \frac{\exp(\alpha_j + \boldsymbol{X_i\beta_j})}{1+\exp(\alpha_j + \boldsymbol{X_i\beta_j})}, \quad j = 1, \dots, M-1\ ,\ i = 1, \dots, n$$

with

$$P(Y_i = 1) = 1 - g\left(\boldsymbol{X_i\beta_j}\right)$$

$$P(Y_i = j) = g\left(\boldsymbol{X_i\beta_{j-1}}\right) - g\left(\boldsymbol{X_i\beta_j}\right), \qquad j = 2, \dots, M-1 \qquad (۲)$$

$$P(Y_i = M) = g(\boldsymbol{X_i\beta_{M-1}})$$

In this equation, M is the number of categories of the ordinal dependent variable (loan quality), whereas i refers to the loan, and X_i shows the vector of predictors (explanatory variables) for the *i*th loan with β_j indicating is the vector of parameters to be estimated.

5. Results

The Brant test indicated that the proportional odds assumption across the different categories of loan quality (cutoff points) was significantly violated. Therefore, we estimated generalized logistic regression models. According to

this model estimation results and the marginal effects of the explanatory variables on different levels of dependent variable, the most important results of this paper are as follows:

The change of compensation system from a "volume-based system" to a "system based on volume and performance" improved the micro-lending quality. This result indicates that this change in the compensation system has led to an improvement in the BCC credit decisions, which, according to related literature, may be due to increased screening efforts of the BCC to separate high-risk and low-risk customers, after the change of the compensation system.

Replacement of retirees by young people in the Branch Credit Committee (BCC) increased quality of micro-lending. This is because of differences between youth and retirees in screening efforts and risk-taking levels, which are due to their different career concerns and career prospects.

Increasing the presence of women in the BCC improved the micro-lending quality. This finding is consistent with the related studies (for example, see Eckel and Grossman 2008; Borghans et al. 2009; Montalvo and Reynal-Querol 2020) and is due to that women are generally more risk averse than men, which leads to better compliance of women with credit guidelines and recommendations, more conservatism in lending, and granting loans more restrictively than those of their men counterparts.

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