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Abstract

Agricultural lenders in today's environment face many challenges when evaluating the creditworthiness of farm borrowers. To address these challenges, a survey was conducted with financial institutions in Kansas and Indiana where agricultural lenders were asked for their response to hypothetical agricultural loan requests. Each loan request differed by the borrower's character, financial record keeping, productive standing, Fair Isaac credit bureau score, and credit risk. Lenders provided information about themselves and their financial institutions.

The survey data obtained determine the relative importance of financial and non-financial information when analyzing agricultural loan applications. Tobit models are estimated to identify the borrower and lender characteristics that are important in determining loan approval while OLS models are used to investigate the factors that affect interest rates offered to farm borrowers. The results provide a comparison of agricultural lending between two important agricultural states. The results from this analysis also provide lenders with insight on the factors that influence the decision making process of other agricultural lenders.

Keywords: Agricultural loans, Credit bureau score, Credit evaluation, Interest rates
JEL codes: G2, G21

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Determining What's Really Important to Lenders: Factors Affecting the Agricultural Loan Decision-Making Process

by
Christine A. Wilson, Allen M. Featherstone, Terry L. Kastens, and John D. Jones

The challenges agricultural lenders face when evaluating the creditworthiness of farm borrowers have dramatically changed over the last several decades. During the mid 1980s, American agriculture suffered through times similar to those of the Great Depression that again demonstrated the consequences of relying on collateral values supported by inflationary expectations rather than cash flows. As a result, many lenders adopted methods that more accurately measure the financial position of agricultural producers such as credit bureau scores.

Many studies have examined the methods used by lenders without achieving a consensus as to which quantitative and qualitative factors are most important in the agricultural loan decision-making process. In this study, data from a survey administered to financial institutions in Kansas and Indiana are used to study the agricultural lending process. The primary objective is to analyze the factors financial institutions consider when lending to farm borrowers. The specific objectives are to: 1) determine the relative importance of financial and non-financial information when analyzing agricultural loan applications; and 2) identify the borrower and lender characteristics important in determining loan approval and interest rates.

Credit Evaluation

According to Gustafson (1989), agricultural lenders use the five C's of credit (capacity, capital, collateral, character, and conditions) when evaluating an agricultural loan application. Gustafson (1989) states that lenders judge these attributes using information obtained from previous experience with a borrower in conjunction with financial statements, references, and other documentation. An individual lender or committee decides whether a borrower possesses ample ability to repay for the use of loan funds. While Gustafson (1989) acknowledges developments in credit evaluation, he suggests that research focusing on the relationship between management decisions, attributes, and traits that distinguish one farmer's behavior from another could enhance assessment accuracy.

In the early 1990s, Gustafson, Beyer, and Saxowksy (1991) administered a survey to ten agricultural loan officers in the Red River Valley of southeastern North Dakota and west-central Minnesota to determine information sources, credit evaluation procedures, and lending heuristics used. In the survey, lenders described their methods of credit evaluation and responded to seven hypothetical credit situations. Gustafson, Beyer, and Saxowksy (1991) found that lenders placed significant weight on the borrower's financial information and personal characteristics (honesty, integrity, and production-management ability) when making decisions regarding approval, levels of credit, and need for servicing action.

Ellinger, Splett, and Barry (1992) utilized a survey to examine credit evaluation procedures, risk assessment methods, and credit model consistencies among agricultural banks in Illinois and Iowa. They found that, following the farm financial crisis of the 1980s, lenders used more formal and comprehensive methods to evaluate the creditworthiness of agricultural borrowers. Their results indicated that nearly 60% of the lenders used a credit-scoring model to assist in loan approval, loan pricing, loan monitoring, and evaluation of loan portfolio risks. However, their results indicated a relatively high level of disparity among the systems in use by lenders.

Substantial research on credit risk assessment in agricultural lending has yielded mixed results about which factors to include in the development and validation of credit scoring models (Barry and Ellinger, 1989; Splett et al., 1994). In the late 1980s, Miller and LaDue (1989) focused on the development of credit scoring models for dairy farmers by employing measures of farm size, liquidity, solvency, profitability, capital efficiency, and operating efficiency as explanatory variables. Miller and LaDue (1989) used 203 dairy loans from an agricultural loan portfolio for a single bank in upstate New York. Using logistic regression, they found that the quality of larger borrowers was predicted by liquidity, profitability, and operating efficiency measures.

Using data from 9,403 loans made by Canada's Farm Credit Corporation, Turvey (1991) conducted a similar study by empirically estimating four alternative credit-scoring models. The results indicated that liquidity and leverage were strong determinants of default risk, in addition to profitability and efficiency. However, results from further analysis supported the inclusion of both qualitative and quantitative factors when selecting a method to evaluate the creditworthiness of farm borrowers.

Splett et al. (1994) built upon previous studies by employing a joint experience and statistical approach to develop and evaluate credit-scoring models. Experienced lenders from the Sixth Farm Credit District were used to develop models that incorporated lender experience, knowledge, and intuition. Financial ratios from the Farm Financial Standards Council (FFSC) were used with other collateral measures to develop experienced term-loan and operating-loan models. The models were estimated using logistic regression to determine the relationship between experience and statistical credit scoring models. The results indicated that the statistical models were moderately successful in replicating lender behavior and classifying actual loans.

Featherstone, Roessler, and Barry (2006) analyzed the Seventh Farm Credit District's loan portfolio from 1995 to 2002 using repayment capacity, solvency, and liquidity to determine the accuracy of financial performance ratios in predicting the expected probability of default status. Results from the study showed that the underwriting guidelines in place within the Seventh Farm Credit District were statistically significant in predicting the expected probability of default.

Lenders' Responses to Loan Requests

During the late 1960s, Baker (1968) introduced the simulated borrowing method as an alternative for evaluating lender responses to various managerial choices in a farm's financial and production organization. He justified this by noting that actual loan data are limiting because they are restricted to only approved loans and fail to include marginal loans that may be rejected. By empirically testing lender responses to hypothetical loans, he concluded that banks and credit associations prefer loans that are: (1) self-liquidating and (2) asset-generating.

Barry and Willmann (1976) used the simulated borrowing method to develop the decision elements for a risk-programming model of a representative case farm for the Southern Blacklands of Texas and to survey the credit responses of lenders to contract choices. They found that lenders' credit response may modify the producer's contracting plans and his or her rate of income growth.

Sonka, Dixon, and Jones (1980) applied similar methods to assess the impact of the firm's financial structure on its external credit limits for 33 agricultural lenders in east central Illinois. Each loan officer was asked to evaluate and respond to five loan situations that varied by financial stress. In each case, the borrower had recently purchased farmland, and was requesting $60,000 to replace a combine and build grain storage facilities. The authors found that lender responses fell into two groups, a conservative group and a liberal group, with respect to the average loan amount approved. They also found that these two groupings of lenders responded differently to the borrower's financial position and structure.

Barry, Baker, and Sanint (1981) used two different lender surveys to examine the concepts underlying farmers' credit risks and to determine how credit may influence farmers' debt use. The first survey asked 101 unit banks and Production Credit Associations (PCAs) in south central and eastern Texas to respond to a representative farming situation. From this survey, 34 responses included loan limits, interest rates, collateral requirements, and other loan requirements. A second survey, conducted by the Federal Reserve Bank of Chicago, resulted in several hundred responses to farm lending conditions. The authors found that a farmer's credit position was positively correlated with changes in the level of farm income and that this correlation was stronger for capital credit than for operating credit. They also found that variation in fund availability from rural banks contributed to high credit risks.

During the mid 1980s, Pflueger and Barry (1986) elicited commercial banks' and PCAs' responses to a farmer's use of crop insurance. The 55 lenders in Illinois analyzed two case loan requests containing a farmer biography, description of the Federal Crop Insurance program, and historic and projected financial statements. Each lender evaluated the case loans in terms of maximum credit limits for operating and capital loans, interest rates, loan maturities, security requirements, and other loan provisions. The results indicated that approximately 60% of lenders responded in a positive manner to a borrower's participation in the Federal Crop Insurance program. The results also indicated that the magnitude of credit responses differed considerably while interest rates and loan maturities stayed about the same.

In a 1993 study, Dixon, Ahrendsen, and Barry (1993) formulated a two-equation model with the goals of identifying and estimating the variables that lead banks to charge different interest rates on agricultural loans. They used data from a 1990 survey of 34 commercial banks in western Arkansas responding to four hypothetical agricultural loan requests. Each request, which differed by the borrower's financial strength, consisted of an intermediate-term loan of $150,000 for the construction of two broiler houses and a short-term loan of $95,000 for the purchase of stocker steers. They found that for both loans, interest rates were positively correlated with the bank's loan to deposit ratio. Results also indicated that banks facing losses may be more aggressive when pricing loans due to the marginal profitability of the loans.

Bard, Barry, and Ellinger (2000) used a case study to evaluate the influence of changes in the banking industry on the cost and availability of agricultural credit. They asked 1,064 commercial banks in Illinois, Iowa, and Indiana to respond to case loans for two of three hypothetical farm borrowers with different demographic characteristics and credit needs. Bard, Barry, and Ellinger (2000) analyzed the data from the 114 responding banks and found no overwhelming evidence in support of or against commercial bank consolidation as it affects agricultural lending. Thus, results suggest that other non-measured factors influence the loan terms offered by commercial banks to agricultural borrowers.

The number of studies examining the agricultural lending decision provides strong evidence that lenders consider both financial and non-financial variables when evaluating the creditworthiness of farm borrowers. However, various credit evaluation procedures and methods have been studied without achieving a consensus as to which variable measures should be used when analyzing agricultural loan applications. Furthermore, while there have been many studies, the majority of them do not explicitly consider how lenders use credit bureau scores when lending to farm borrowers. Thus, further research pertaining to the lender's assessment, especially as it relates to the agricultural loan decision-making process, is needed.

Theoretical Framework

Traditionally, lenders have applied the five C's of credit when analyzing the creditworthiness of a farm borrower. The first C, which is capacity, refers to a borrower's ability to repay a loan obligation and bear the subsequent financial risk (Gustafson, 1989). Lenders generally analyze a borrower's repayment capacity by conducting an analysis of both historical and projected profitability and cash flow of the farm business.

Capital is the second C of credit and refers to the funds available to operate a farm business. To assess capital, lenders review balance sheets from both current and previous years, and calculate financial measures of liquidity and solvency. This allows the lender to gauge the amount of equity a borrower has invested in the operation and how effectively that investment generates cash flows.

The third C, which is collateral, represents a security agreement that serves as a final source of repayment to the lender if the borrower defaults on the terms of the loan agreement. Since lenders seek to maximize profits, they carefully consider the risk/return relationship of the loan request. As risk increases, lenders will seek larger amounts and/or higher quality collateral.

Conditions are the fourth C of credit and refer to the intended purpose of the loan. Lenders consider factors such as the loan amount, the use of the funds, and the repayment terms. The lender also considers the overall economy, including interest rate levels, inflation rate, and demand for money.

The fifth C, which is character, encompasses personal factors such as honesty, integrity, and reliability. The borrower's risk attitude is an important element of this human factor considered in the loan decision-making process. If a borrower has a negative evaluation on this factor, the loan may be rejected even if the other four factors are very good.

Credit Bureau Reports and Scores

An additional component that is an important part of the decision-making process for loan analysis is credit bureau reports. A credit bureau report is a detailed account of an individual's credit history (FICO). A credit bureau or credit-reporting agency maintains files on millions of borrowers containing information collected from lenders, creditors, insurers, and employers. The three major credit bureaus, Equifax, Experian, and TransUnion, all provide credit bureau reports.

The typical credit bureau report includes four categories of information. The first category contains personal or identifying information including the individual's name, current and previous addresses, telephone number, social security number, date of birth, and current and previous employers. The second category outlines the individual's credit history providing specific details about credit accounts and loans, including late payments, skipped payments, accounts turned over to collection agencies, and repossessions. The third category contains public record information from local, state, and federal courts and information on overdue debt from collection agencies. Public record information includes bankruptcies, foreclosures, suits, wage attachments, liens, and judgments (FICO).

Inquiries are the last category of information in a credit bureau report. This includes a list of everyone who has voluntarily or involuntarily accessed credit bureau reports on the individual within the last two years. Voluntary inquiries are initiated by the individual for obtaining credit, while involuntary inquires are situations where lenders have accessed and reviewed the credit bureau report for pre-approved credit offers. Although both types are part of a credit bureau report, involuntary inquiries do not appear on the credit bureau report that a lender receives.

Along with a credit bureau report, lenders can also purchase a credit score from each of the credit reporting agencies. The credit score in the credit bureau report is calculated using a formula developed by the Fair Isaac Corporation. Although the specific relationship is unpublished, there are five basic factors used in determining a credit score (Figure 1).

Since lenders and other credit grantors may not report account activity to all credit bureaus, an individual's credit score may vary among the three credit bureaus. Credit scores range from 400 to 900, with the average around 700. According to the scoring model, as an individual's score increases, his or her risk of default decreases.

Experimental Design

Survey Methodology and Instrument

The primary objective of this study is to analyze the factors that financial institutions consider when lending to farm borrowers. To obtain the required data, the hypothetical borrowing approach is used. The basics of this method include conducting a simulated borrowing experiment through a mail survey to elicit lenders' responses to hypothetical agricultural loan requests. The survey was conducted in Kansas and Indiana.

The survey instrument is a combination of hypothetical agricultural loan requests and a survey questionnaire. Each loan request consists of four sections: (1) farmer scenario, (2) borrower's financials, (3) ratio analysis, and (4) the agricultural lending decision. The farmer scenario section provides a biographical sketch of the individual farmer and presents his request for funds to purchase an additional tractor. As Table 1 shows, both Kansas and Indiana have a number of farms that are comparable in size and value of sales. Although Kansas has more livestock enterprises, both states have a large number of agricultural operations that are involved in the production of grain and oilseeds (Table 2). Therefore, lenders in both states presumably encounter similar loan applications from farmers of these types of operations.

The borrower's financial section includes accounting information from the balance sheet, income statement, and cash flow statement for the years ending December 31, 2002 through 2004. The ratio analysis section contains financial measures of liquidity, solvency, profitability, repayment capacity, and financial efficiency. The agricultural lending decision section presents a variety of questions concerning the agricultural loan decision-making process, including the decision the borrower would receive from the lender's financial institution.

The second component of the survey instrument is a one-page survey that consists of two sections: bank characteristics and loan officer characteristics. The bank characteristics section focuses on descriptive factors about the financial institution. Such factors include bank size, portfolio composition, profitability, lending risk, and location. *ASSETSIZ* is the total asset size of the bank (billions of dollars); *CA* is the bank's ratio of capital to assets (percent); *ALTL* is the bank's ratio of agricultural loans to total loans (percent);

ROA is the bank's return on assets (percent); *LNDE* is the bank's ratio of loans to deposits (percent); and *NCLTL* is the bank's ratio of non-current loans to total loans (percent). The loan officer characteristics section requests information about the responding lender's degree of involvement in agricultural lending, his or her individual lending authority, and their decision making authority. *EXP* is the number of years of lending experience the loan officer has as an agricultural loan officer (years); *PTIME* is the percentage of time the loan officer spends on agricultural loans (percent); and *MLA* is the loan officer's maximum individual lending authority (dollars). See Appendix A for a copy of the survey instrument and the accompanying information provided to the lender.

Survey Design

A total of 144 hypothetical agricultural loan scenarios were created. For each of the 144 scenarios, the personal and business information as well as the loan request (amount and purpose) are the same, with the exception of the farmer's name. Conversely, the farmer attributes vary by the borrower's character, financial record keeping, productive standing, credit risk, and Fair Isaac credit bureau score. The information provided to the lender is much the same across alternative loan requests to minimize the review time required by the lender while maximizing the information provided.[2]

Another step in designing the survey instrument consists of preparing key financial statements that match with the credit risk ratings. Two sources of data, the Kansas Farm Management Association (KFMA) Annual Whole-Farm and Enterprise Summaries and the 2002 Census of Agriculture from Kansas and Indiana were used to create four sets of financial statements. Financial measures of liquidity, solvency, profitability, repayment capacity, and financial efficiency were calculated in accordance with the recommendations of the Farm Financial Standards Council (FFSC). The expected probability of default (credit risk) is calculated for each of the sets of variables using the credit-scoring model defined in Featherstone, Roessler, and Barry (2006). To determine the probability of default, first determine the log odds ratio:

$$Ln\left(\frac{probability\ of\ default}{1 - probability\ of\ default}\right) = -2.3643 - .00135(RC) - .0217(OE) - .00399(WC) \qquad \textbf{(1)}$$

where *RC* is the repayment capacity percentage, *OE* is the owner equity percentage, and *WC* is the working capital percentage. Next, calculate the expected probability of default:

$$Probability\ of\ Default = \frac{e^{xb}}{1+e^{xb}} \qquad \textbf{(2)}$$

[2] See Appendix A or Jones (2005) for a copy of the survey instrument and the accompanying information provided to the lender.

where *xb* is the result of equation (1)'s right hand side. Table 3 reports the expected probability of default for each credit risk variable with respect to year. These four scenarios are consistent with the distribution of credit ratings found by Haverkamp (2003) who found that ninety percent of the observations of credit ratings for Kansas farms were in this range. See Appendix B for the credit scoring model and expected probability of default results and information.

Survey Process

Following a survey pretest and approval process, a systematic method selected the loan requests and assigned them to the lender (Table 4). The EXCEL RANDBETWEEN function chose a random number between 1 and 144 that corresponded to a hypothetical agricultural loan request. Blocking and replication methods ensured the probability of receiving a specific loan request remains constant across the scenarios given to each lender. In situations where duplicate scenarios occurred, new scenarios were generated and reassigned to the lender. An Excel macro was created to produce a Microsoft Excel database that contained information on 10,016 hypothetical agricultural loan requests. The loan application packages for the sample lenders included a cover letter, four loan requests, one questionnaire, and a business reply envelope (Appendix A).

Lending Factors and Levels

A key issue in examining the factors financial institutions consider in production agriculture lending is to identify the sources of variation. The factors of interest to this study were character, Fair Isaac credit bureau score, financial record keeping, productive standing, and credit risk. Levels for each of these factors were defined.

Character (CHAR) – is a qualitative non-financial variable that encompasses personal factors such as honesty, integrity, and reliability. The borrower's character is defined by two levels: honest or dishonest. The borrower is honest if the lender visited with a number of individuals in the agricultural community and they all indicated that the farmer was honest in his business dealings. The borrower is classified as dishonest if three of the individuals in the agricultural community expressed concerns regarding fairness in business transactions with the farmer. *CHAR* is "1" if the individual is defined as honest and "0" if the individual is classified as dishonest.

Fair Isaac Credit Bureau Score (FICO) **–** is a quantitative non-financial variable that provides an indication of the borrower's financial integrity. A Fair Isaac credit bureau score of 725 represents a low-risk borrower, while a score of 560 represents a high-risk borrower. *FICO* is "1" if the farmer has a Fair Isaac credit bureau score of 725 points and "0" if the farmer has a Fair Isaac credit bureau score of 560 points.

Financial Record Keeping (EXCFRK, AVGFRK) **–** is a qualitative non-financial variable that represents the borrower's ability to maintain complete and accurate up-to-date records. This includes borrowers who keep their own records by using computerized applications, or other innovations for farm accounting and financial management purposes. This also includes borrowers who employ an accountant or record service to provide computerized record keeping, whole farm and enterprise analysis, and tax preparation. A distinction is not made between these two forms of financial recording keeping. In this study, the borrower's financial record keeping ability is defined as excellent, average, or poor. *EXCFRK* is "1" if the observation corresponds to a scenario where the farmer is an excellent financial record keeper and "0" otherwise. *AVGFRK* is "1" if the observation corresponds to a scenario where the farmer is an average financial record keeper and "0" otherwise. The default category is a poor record keeper.

Productive Standing (PSUPQ, PSMID) – is a qualitative non-financial variable that refers to the borrower's ability to manage business risk, select appropriate production and marketing activities, and meet realistic price and yield assumptions. Three levels, upper quartile, middle-half, and lower quartile are used to define the productive standing. Each level provides a measure of how the borrower's operation ranks in comparison to other industry participants. *PSUPQ* is "1" if the observation corresponds to a scenario where the operation ranks in the upper quartile and "0" otherwise. *PSMID* is "1" if the observation corresponds to a scenario where the operation ranks in the middle and "0" otherwise. The default category represents a producer in the lower quartile.

Credit Risk (CR) – is a quantitative financial variable that consists of the borrower's financials and ratio analysis. The borrower's financials include three years of selected accounting information from the balance sheet, income statement, and cash flow statement, while the ratio analysis contains financial measures of liquidity, solvency, profitability, repayment capacity, and financial efficiency. In this study, the borrower's credit risk is represented by four levels. *CR* is "7.61" if the observation corresponds to a scenario where the expected probability of default is 7.61%, "3.68" if the observation corresponds to a scenario where the expected probability of default is 3.68%, "1.48" if the observation corresponds to a scenario where the expected probability of default is 1.48% and "0.74" if the observation corresponds to a scenario where the expected probability of default is 0.74%. Alternatively, *CR1*, *CR2*, *CR3*, and *CR4* are equal to "1" if the probability of default is 7.61%, 3.68%, 1.48%, and 0.74%, respectively and "0" otherwise.

The full factorial design, which is the total combination of these factors and their levels, results in the 144 (2 x 2 x 3 x 3 x 4) combinations of hypothetical agricultural loans. Each combination represents a farmer scenario coded by assigning one of the most common names that occurred during the 1990 United States Census. As examples, Figure 2 summarizes four of the 144 possible combinations of the loan requests. Lenders analyzed and responded to four systematically selected loan requests by providing the loan amount, interest rate, and terms that they would offer to each borrower. The loan amount and interest rate represent the response variables and are dependent variables used in the analysis. The variable L_i is the proportion of the tractor loan granted and R_i is the interest rate charged by the financial institution if the loan is approved (percent).

Financial Institution Population and Sample

The Federal Deposit Insurance Corporation (FDIC) website indicated that 3,270 commercial banks in the United States had at least $1 million in agricultural loans outstanding as of December 31, 2004. In Kansas, 277 U.S. commercial banks with 978 lending offices, and in Indiana 100 U.S. commercial banks with 1,471 lending offices were selected. Additionally, each Farm Credit office in Kansas and Indiana is included in the sample. Twenty-seven Farm Credit offices in Kansas and 28 in Indiana are included in the sample. The survey was mailed to the 277 commercial banks and 27 Farm Credit offices in Kansas during the week of April 18, 2005. A similar survey was mailed to the 100 commercial banks and 28 Farm Credit offices in Indiana during the week of May 13, 2005.

Empirical Models

Loan Amount

In this study, a two-limit Tobit model is estimated because the dependent variable is constrained by the minimum (0) and maximum (1) portion of the loan request that a borrower may receive. The observed dependent variable L_i is determined as follows:

$$L_i = \begin{cases} 0 & \text{if} \quad L_i^* = \beta' X_i + \varepsilon_i \leq 0 \\ L_i^* & \text{if} \quad 0 < \beta' X_i + \varepsilon_i < 1 \\ 1 & \text{if} \quad L_i^* = \beta' X_i + \varepsilon_i \geq 1 \end{cases} \qquad \textbf{(3)}$$

where L_i^* is a latent variable, β' is a vector of the slope coefficients for the matrix of X_i parameters, and ε_i is the error term.

In the first two-limit Tobit model estimated for the tractor loan amount granted, the variables (*CR3*) and (*CR4*) are included to represent the credit risk or expected probability of default that corresponds to each loan request. Loan observations where the expected probability of default was 7.61 were not included in this model because the lenders in both Kansas and Indiana denied all of these loan requests. The two-limit Tobit model is specified as follows:

$$\begin{aligned} L_i = {} & \beta_0 + \beta_1 CHAR_i + \beta_2 FICO_i + \beta_3 EXCFRK_i + \beta_4 AVGFRK_i \\ & + \beta_5 PSUPQ_i + \beta_6 PSMID_i + \beta_7 CR3_i + \beta_8 CR4_i + \beta_9 ASSETSIZ_i \\ & + \beta_{10} ROA_i + \beta_{11} NCLTL_i + \beta_{12} EXP_i + \beta_{13} PTIME_i + \varepsilon_\beta \end{aligned} \qquad \textbf{(4)}$$

In the second two-limit Tobit model estimated, the variable (*CR*) represents the credit risk or expected probability of default that corresponds to each loan request. Contrary to the first two-limit Tobit model, the analysis includes all observations where sufficient information was provided. The second two-limit Tobit model is specified as follows:

$$\begin{aligned} L_i \;=\;& \beta_0 + \beta_1\, CHAR_i + \beta_2\, FICO_i + \beta_3\, EXCFRK_i + \beta_4\, AVGFRK_i \\ &+ \beta_5\, PSUPQ_i + \beta_6\, PSMID_i + \beta_7\, CR_i + \beta_8\, ASSETSIZ_i + \beta_9\, ROA_i \\ &+ \beta_{10}\, NCLTL_i + \beta_{11}\, EXP_i + \beta_{12}\, PTIME_i + \varepsilon_\beta \end{aligned} \qquad \textbf{(5)}$$

Both models (equations 4 and 5) are estimated using the PROC QLIM procedure in SAS to determine the characteristics important in determining loan approval.

Interest Rate

The interest rate offered only on the approved loan observations is included as the dependent variable in two separate models (denied loans are excluded in this analysis). The first model, which includes the same independent variables as the first two-limit Tobit model, is specified as follows:

$$\begin{aligned} R_i \;=\;& \alpha_0 + \alpha_1\, CHAR_i + \alpha_2\, FICO_i + \alpha_3\, EXCFRK_i + \alpha_4\, AVGFRK_i \\ &+ \alpha_5\, PSUPQ_i + \alpha_6\, PSMID_i + \alpha_7\, CR3_i + \alpha_8\, CR4_i + \alpha_9\, ASSETSIZ_i \\ &+ \alpha_{10}\, ROA_i + \alpha_{11}\, NCLTL_i + \alpha_{12}\, EXP_i + \alpha_{13}\, PTIME_i + \varepsilon_\alpha \end{aligned} \qquad \textbf{(6)}$$

The second model includes the same independent variables used in the second two-limit Tobit model and is specified as follows:

$$\begin{aligned} R_i \;=\;& \alpha_0 + \alpha_1\, CHAR_i + \alpha_2\, FICO_i + \alpha_3\, EXCFRK_i + \alpha_4\, AVGFRK_i \\ &+ \alpha_5\, PSUPQ_i + \alpha_6\, PSMID_i + \alpha_7\, CR_i + \alpha_8\, ASSETSIZ_i + \alpha_9\, ROA_i \\ &+ \alpha_{10}\, NCLTL_i + \alpha_{11}\, EXP_i + \alpha_{12}\, PTIME_i + \varepsilon_\alpha \end{aligned} \qquad \textbf{(7)}$$

Both models (equations 6 and 7) are estimated in SAS using the ordinary least squares procedure to determine the borrower and lender characteristics important in determining interest rates.

Results

Overall Survey Response

One hundred eighteen useable responses were returned, resulting in a total response rate of 38.82% for the lending offices in Kansas (Table 5). A breakdown indicates that 106 responses were received from commercial banks, and 12 responses from the Farm Credit System. One hundred seventeen of the participating lenders provided responses to the four loan requests they were assigned while one lender only responded to three of the given loan requests, resulting in 471 loan observations for Kansas.

In Indiana, 52 useable responses were returned from commercial banks and nine were received from the Farm Credit System, resulting in 244 observations from Indiana. The final survey response rate was 47.66% for the lenders in Indiana. The total response rate was 41.91% for commercial banks and 38.18% for Farm Credit Services (Table 5). The overall response rate was 41.44% for the lenders in both Kansas and Indiana.

Survey Results

This section is divided into three segments that correspond to specific components of the survey instrument: (1) loan requests, (2) bank characteristics, and (3) loan officer characteristics.

Loan Requests

Since the results are dependent upon which loan requests lenders responded to, it is important to examine the responses received to assess non-response bias. A summary of the distribution of responses obtained from Kansas and Indiana lenders on the combinations of hypothetical agricultural loan requests is presented in Table 6. See Appendix C for a more detailed summary of the distribution and lender comments. The distribution of responses received should correspond to scenarios that represent an expected percent for all levels of that factor. The expected percent for character and Fair Isaac credit bureau score is 50%, while the expected percent for financial record keeping and productive standing is 33.33%. Credit risk is defined by four levels; therefore, the expected percent for each level is 25%. A subjective analysis of the distribution shows that the responses received is consistent with the expected percents for all factors and their levels.

Table 7 summarizes the distribution of decisions made by the lenders regarding loan approval or denial. Although lenders in both states approved more loans than they denied, lenders in Indiana approved 59.58% of the loans while lenders in Kansas approved 57.75% of the loans. The average loan amount offered by Kansas lenders on both approved and denied loans was $44,994 while the average loan amount offered by Indiana lenders on both approved and denied loans was $43,491 (Table 8). However, the average loan amount offered by Indiana lenders on approved loans was $107,449 while the average loan amount offered by Kansas lenders on approved loans was $106,458. The average interest rate offered by Indiana lenders was 38 basis points lower, and ranged from 5.60% to 8.75%; the standard deviation was 0.72%. The average interest rate offered by Kansas lenders ranged from 5.75% to 9.75%; the standard deviation was 0.77%. On average, lenders in Kansas were willing to extend the loan for 6.27 years while lenders in Indiana were willing to loan for only 6.15 years. Lenders in both states commented that they traditionally approve machinery and equipment loans for 5 years, but were willing to approve the loan for 6 years since the borrower was requesting a 7-year loan. See Appendix C for lender comments.

The interest rate offered by lenders in Kansas was on average nine basis points higher than their typical interest rate, and ranged from 125 basis points lower to 200 basis points higher (Table 9). Indiana lenders offered an interest rate that was on average 15 basis points higher than their typical interest rate with a range from -100 basis points to +200 basis points. Numerous lenders in both Kansas and Indiana commented that the interest rate was a specific percent above the Wall Street Prime or their bank prime rate. See Appendix C for lender comments.

The survey asked lenders if the loan would be score carded in a typical situation, or if it had been score carded. The results presented in Table 10 represent the percent of lenders who were using some type of score card system in their loan decision-making processes. The results show that over 59% of the lenders in Indiana were using a score card system, while less than 31% of the lenders in Kansas were applying similar methods.

Lenders were asked why they approved or denied the loan. Figure 3 displays the reasons noted by lenders for approving the loan requests, while Figure 4 summarizes reasons for denying the loan requests. It is clear that credit risk was the dominating reason for both approving and denying the loan requests. Other specified reasons were listed as the second most important factor; however, a strong correlation may exist between credit risk and other specified reasons. Character appears to have a greater impact on the loan decision in Kansas, while the Fair Isaac credit bureau score is considered more important in Indiana. Productive standing was noted as being more important for approving the loan requests than financial record keeping in both Kansas and Indiana. However, both factors were noted as having very little impact on the denial of the loan requests.

Bank Characteristics

Total assets (*ASSETSIZ*) for the 113 responding banks in Kansas averaged \$5.46 billion and ranged from \$200,000 to \$195 billion; the standard deviation was \$28.46 billion (Table 11). A breakdown indicates 47.35% of these banks had total assets less than \$100 million. The average total assets for the 53 responding banks in Indiana were \$46.85 billion, and ranged from \$890,000 to \$1,157 billion; the standard deviation was \$179.28 billion. A breakdown indicates 14.75% of these banks had total assets of \$100.00 million or less.

The mean capital to asset ratio (*CA*) for the 108 responding banks in Kansas was 13.37%, and ranged from 1.06% to 100.00%; the standard deviation was 10.97%. Results show 12.53% of these banks had a ratio of 7.00% or less; 35.67% had a ratio between 7.00% and 10.00%; and 51.80% were greater than 10.00%. The mean ratio for the 44 responding banks in Indiana was 11.95%, and ranged from 1.01% to 50.00%; the standard deviation was 6.53%. Results show 21.31% of these banks had a ratio of 7.00% or less; 27.87% had a ratio between 7.00% and 10.00%; and 50.82% were greater than 10.00%.

The average agricultural loan ratio (*ALTL*) for the 110 responding banks in Kansas was 46.62%, and ranged from 1.60% to 100.00%; the standard deviation was 29.37%. A breakdown indicates 33.76% of these banks had a ratio of 25.00% or less; 41.61% had a ratio between 25.00% and 65.00%; and 24.63% were greater than 65.00%. The mean ratio for the 46 responding banks in Indiana was 27.10%, and ranged from 0.40% to 88.60%; the standard deviation was 27.49%. A breakdown indicates 68.85% of the banks had a ratio of 25.00% or less; 16.39% had a ratio between 25.00% and 65.00%; and 14.75% were greater than 65.00%.

The mean return on assets (*ROA*) for the 105 responding banks in Kansas was 1.51%, and ranged from -0.77% to 7.14%; the standard deviation was 1.01%. Results show 35.46% of these banks had an *ROA* of less than 1.00%. The mean *ROA* for the 48 responding banks in Indiana was 1.33%, and ranged from 0.38% to 2.40%; the standard deviation was 0.53%. Results show 39.34% of these banks had an *ROA* of 1.00% or less.

The average loan to deposit ratio (*LNDE*) for the 100 responding banks in Kansas was 71.78%, and ranged from 31.00% to 113.00%; the standard deviation was 18.21%. A breakdown indicates 46.50% of the banks had a ratio of 65% or less; 28.03% had a ratio between 65% and 80%; and 25.48% had a ratio greater than 80%. The average ratio for the 40 responding banks in Indiana was 84.67%, and ranged from 50.00% to 112.00%; the standard deviation was 14.52%. A breakdown indicates 39.34% of the banks had a ratio of 65% or less; 16.39% had a ratio between 65% and 80%; and 44.26% had a ratio greater than 80%.

The average non-current loans to total loans (*NCLTL*) for the 105 responding banks in Kansas was 1.65%, and ranged from 0.00% to 25.00%; the standard deviation was 2.76%. Results show 61.78% of these banks had a ratio of 1.00% or less; 32.27% had a ratio between 1.00% and 4.00%; and 5.94% were greater than 4.00%. The mean ratio for the 40 responding banks in Indiana was 1.49%, and ranged from 0.01% to 11.16%; the standard deviation was 1.89%. Results show 65.57% of these banks had a ratio of 1.00% or less; 29.51% had a ratio between 1.00% and 4.00%; and 4.92% were greater than 4.00%.

Loan Officer Characteristics

The average number of years' experience as an agricultural loan officer (*EXP*) for the 116 responding lenders in Kansas was 16.03 years, and ranged from 8 months to 40 years; the standard deviation was 9.10 years (Table 12). The mean *EXP* for the 59 responding lenders in Indiana was 17.54 years, and ranged from 1 year to 37 years; the standard deviation was 9.54 years. The mean percent of time Kansas lenders spend on agricultural loans (*PTIME*) was 59.30%, and ranged from 2% to 100%. A breakdown indicates 19.32% of these lenders spend 25% or less of their time on agricultural loans; 28.03% spend between 25% and 50%; 22.08% spend between 50% and 75%; and 30.57% spend greater than 75% of their time on agricultural loans. The mean *PTIME* for the Indiana lenders was 60.36%, and ranged from 5% to 100%. A breakdown indicates 27.87% of these lenders spend 25% or less of their time on agricultural loans; 19.67% spend between 25% and 50%; 11.48% spend between 50% and 75%; and 40.98% spend greater than 75% of their time on agricultural loans.

The average maximum lending authority (*MLA*) for the Kansas lenders was $324,912, and ranged from $0 to $2,000,000. Results show that 71.13% had an *MLA* of $250,000 or less; 11.89% had an *MLA* between $250,000 and $500,000; and 16.99% had an *MLA* greater than $500,000. The mean *MLA* for the Indiana lenders was $662,222, and ranged from $0 to $15,000,000. Results show that 68.85% had an *MLA* of $250,000 or less; 19.67% had an *MLA* between $250,000 and $500,000; and 11.48% had an *MLA* greater than $500,000. A closer look shows that 51.59% of the 113 lenders in Kansas responding to this question had a maximum lending authority less than the requested loan amount of $110,000 while 39.34% of the 54 lenders in Indiana had an *MLA* less than $110,000.

In response to decision-making process, 84% of the lenders in Kansas and 89% of lenders in Indiana indicated that they tend to base their decisions on logic and on objective analysis of cause and effect. However, a few of these lenders stated that they also consider "the five C's of credit" when evaluating an agricultural loan. The remaining 16% of the lenders in Kansas and 11% in Indiana indicated that they tend to base their decisions primarily on values and on objective evaluation of person-centered concerns.

Loan Amount Regression Analysis

The regression results from the first two-limit Tobit model (equation 4) in Table 13 correspond to the Kansas, Indiana, and All observations, respectively. The two non-financial variables, which were statistically significant at the 1% level in Kansas and All, are character (*CHAR*) and Fair Isaac credit bureau score (*FICO*). *FICO* was statistically significant at the 1% level in Indiana, but *CHAR* was not statistically significant. Although both variables had a positive impact on the proportion granted in Kansas, Indiana, and All, results suggest that *FICO* has a larger impact on the proportion granted.

The variables that correspond to the borrower's financial record keeping abilities (*EXCFRK* and *AVGFRK*) suggest that, as the borrower's abilities increased, the proportion of the loan approved increased, which is as expected. However, *EXCFRK* is the only variable that was statistically significant at the 10% level in Indiana and at the 5% level in All, respectively. The two productive standing variables (*PSUPQ* and *PSMID*) were both statistically significant at the 10% level in Kansas, but were not statistically significant in Indiana and All. The results show that the coefficients for *PSMID* are larger than the coefficients for *PSUPQ*, which may imply either that productive standing is not an important factor in the agricultural loan decision-making process or that it is especially important to avoid borrowers in the lower quartile.

The two financial variables (*CR3* and *CR4*), were both statistically significant at the 1% level in Kansas, Indiana, and All. The results suggest that as the expected probability of default for a loan request decreased, the proportion of the loan approved increased, which is as expected. The results also suggest that lenders may have been willing to approve a larger amount on corresponding scenarios since the coefficients for these variables were greater than one.

The bank characteristics (*ASSETSIZ*, *ROA*, and *NCLTL*) all suggest that they had a negative impact on the proportion granted. However, *ASSETSIZ* was not statistically significant in Kansas, Indiana, and All, while *ROA* and *NCLTL* were statistically significant in Kansas and All. The results also imply that years of agricultural loan officer experience (*EXP*) negatively affected the proportion granted in Kansas, Indiana, and All. The results also suggest that the amount of time spent on agricultural loans (*PTIME*) had a positive impact on the proportion granted in Kansas, Indiana, and All. The relationships for both of these loan officer characteristics were statistically significant at the 1% level in Kansas and All while *EXP* was the only loan officer characteristic that was statistically significant in Indiana.

The regression results from the second two-limit Tobit model (equation 5) in Table 14 correspond to the Kansas, Indiana, and All observations, respectively. The variable (*CR*) is used to represent the credit risk or expected probability of default that corresponds to each loan request; the analysis includes all observations where sufficient information was provided. The results presented in this table are consistent with those shown in Table 13. After redefining the credit risk variable, results continue to show that as the expected probability of default for a loan request increased, the proportion of the loan granted decreased.

Interest Rate Regression Analysis

The regression results for the first interest rate model (equation 6) in Table 15 correspond to the Kansas, Indiana, and All observations, respectively. Results suggest that both *CHAR* and *FICO* had a negative impact on the interest rate charged by the financial institution. However, with the exception of *CHAR* in All, *FICO* is the only variable of these two non-financial variables that was statistically significant. It was statistically significant at the 5% level in Kansas, 10% level in Indiana, and the 1% level in All.

The borrower's financial record keeping abilities (*EXCFRK* and *AVGFRK*) display consistent signs but were not statistically significant for Indiana and Kansas. Although an interpretation of these results yields little meaning, results do show that *EXCFRK* and *AVGFRK* were statistically significant at the 5% level in All. The results for the borrower's productive standing (*PSUPQ* and *PSMID*) display inconsistent results across the estimates of these variables. Results for these variables were not statistically significant.

Results show that the two financial variables (*CR3* and *CR4*) had a negative impact on the interest rate in Kansas, Indiana, and All. This suggests that as the expected probability of default for a loan request decreased, the interest charged by the financial institution decreased as well, which is as expected. However, *CR4* was statistically significant at the 1% level in Kansas, Indiana, and All, but *CR3* was not statistically significant.

The bank characteristics (*ASSETSIZ*, *ROA*, and *NCLTL*) showed mixed results in the interest rate model. The results imply that *ASSETSIZ* negatively affected the interest rate in Kansas and All, but had a positive impact on the interest rate in Indiana. *ASSETSIZ* was only statistically significant at the 5% level in Kansas. *ROA* suggests that it had a negative impact on the interest rate charged by lenders in Kansas, Indiana, and All; however, *ROA* was only statistically significant at the 5% level in Kansas and All. The results also suggest that *NCLTL* had a positive impact on the interest rate in Kansas, Indiana, and All. Nonetheless, *NCLTL* was only statistically significant at the 1% level in Indiana and All.

The loan officer characteristics (*EXP* and *PTIME*) also showed mixed results in the interest rate model. The results imply that *EXP* negatively affected the interest rate in Kansas, Indiana, and All, but was only statistically significant at the 5% level in Kansas and All. The results also suggest that *PTIME* had a positive impact on the interest rate charged by the lenders in Kansas and All, but had a negative impact on interest rate in Indiana. *PTIME* was only statistically significant at the 1% level in Kansas.

The regression results from the second model (equation 7) in Table 16 correspond to the Kansas, Indiana, and All observations, respectively. The total number of observations used in the first and second OLS models is the same because the lenders in both Kansas and Indiana denied all loan requests where the expected probability of default was 7.61.

Conclusions

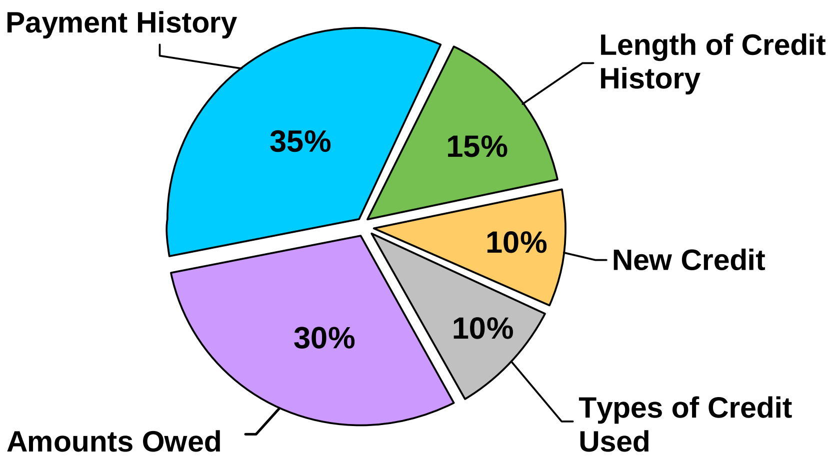
The primary objective of this study was to analyze the factors that financial institutions consider when lending to farm borrowers. To obtain the required data, a survey of financial institutions in both Kansas and Indiana was conducted where agricultural lenders responded to four hypothetical agricultural loan requests. Each loan request differed by the borrower's character, financial record keeping, productive standing, Fair Isaac credit bureau score, and credit risk. Lenders also provided information about themselves and their financial institution.

Two-limit Tobit models determined the borrower and lender characteristics important in determining loan approval. The results suggest that the two non-financial variables, character and Fair Isaac credit bureau score, both significantly influenced the proportion granted in Kansas while Fair Isaac credit bureau score significantly influenced the proportion granted in Indiana. The financial variables representing credit risk, or the expected probability of default, significantly influenced the proportion granted by financial institutions. Return on assets and non-current loans to total loans were the only bank characteristics that significantly influenced the proportion granted in Kansas. The loan officer characteristics, percent of time lenders spent on agricultural loans and number of years' experience as an agricultural loan officer significantly influenced the proportion granted in Kansas.

Interest rate models determined the borrower and lender characteristics important in determining interest rates. Results suggest that the Fair Isaac credit bureau score had a negative impact and significantly influenced the interest rate charged by financial institutions. The credit risk variables had a negative impact on the interest rate charged by financial institutions.

The bank characteristics suggest that total assets and return on assets had a negative impact on the interest rate in Kansas, and were both statistically significant at the 5% level. Results suggest that non-current loans to total loans had a positive impact and statistically influenced the interest rate in Indiana. The results imply that the lender experience as an agricultural loan officer negatively affected the interest rate and was statistically significant at the 5% level in Kansas. The results also suggest that time spent on agricultural lending had a positive impact on the interest rate charged by the lenders in Kansas and was statistically significant at the 1% level.

Figure 1. Categories Used in Determining a Fair Isaac Credit Bureau Score



Source: http://www.myfico.com

Figure 2. Hypothetical Agricultural Loan Requests

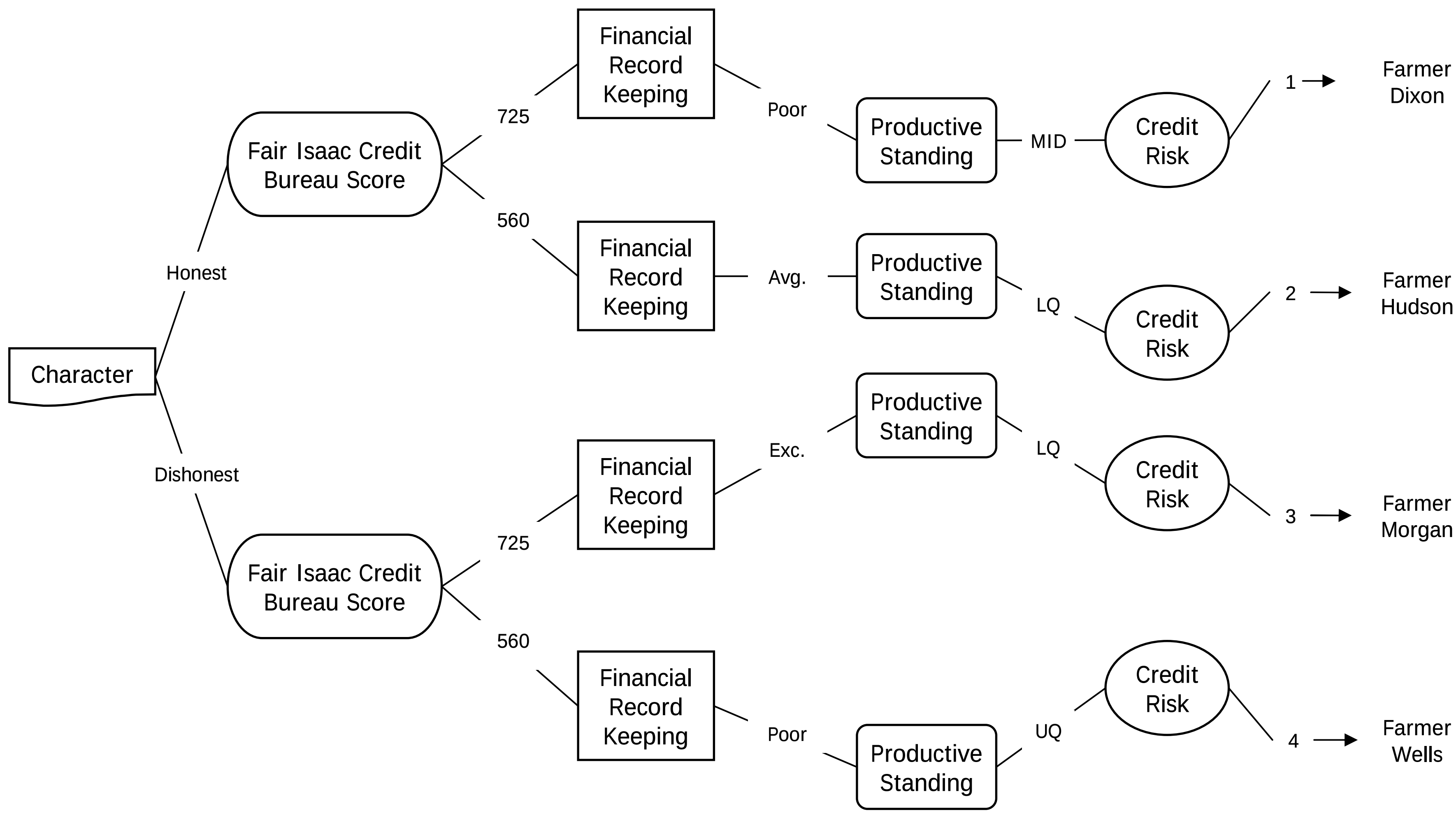


Figure 3. Reasons for Approving the Loan Requests

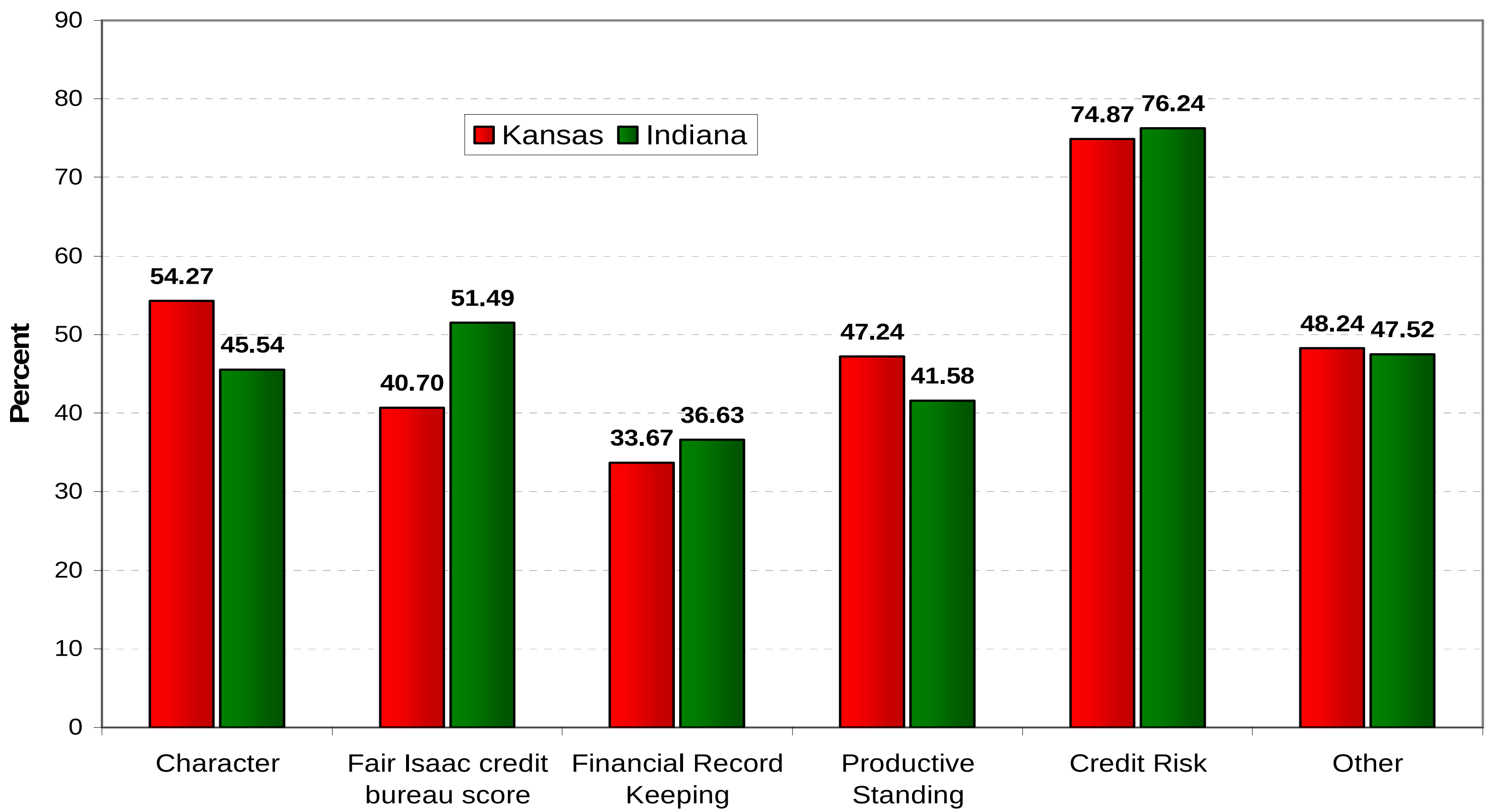


Figure 4. Reasons for Denying the Loan Requests

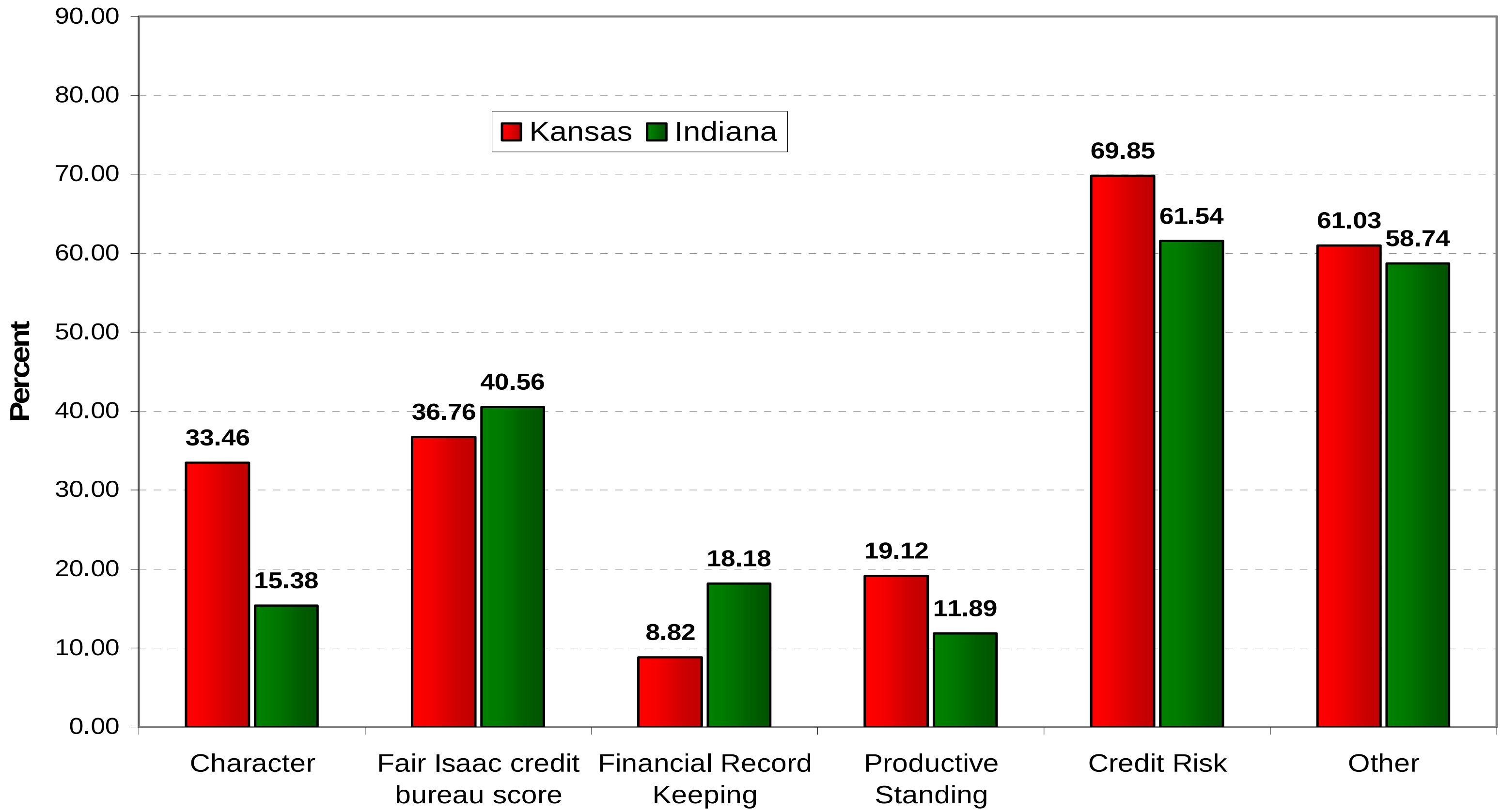


Table 1. 2002 Census of Agriculture State Profiles for Kansas and Indiana

Item		Kansas	Indiana
Farms	number	64,414	60,296
Land in farms	acres	47,227,944	15,058,670
Average size of farm	acres	733	250
Estimated market value of land and buildings			
Average per farm	dollars	505,999	637,645
Average per acre	dollars	687	2,567
Estimated market value of all machinery and equipment:		5,983,765	4,636,855
Average per farm	dollars	95,124	80,240
Farms by size:			
1 to 259 acres		33,149	46,542
260 to 499 acres		8,972	5,443
500 to 999 acres		8,641	4,494
1,000 to 1,999 acres		7,371	2,827
2,000 acres or more		6,281	990
Total cropland	farms	56,703	53,725
	acres	29,542,022	12,909,002
Harvested cropland	farms	44,073	44,298
	acres	18,976,719	11,937,370
Irrigated land	farms	5,915	2,212
	acres	2,678,277	313,130
Market value of agricultural products sold	$1,000	8,746,244	4,783,158
Average per farm	$1,000	135,782	79,328
Crops sales	$1,000	2,418,447	2,992,747
Livestock sales	$1,000	6,327,797	1,790,411
Farms by value of sales:			
Less than $49,999		47,113	44,990
$50,000 to $99,999		6,282	4,945
$100,000 to $499,999		9,205	8,505
$500,000 or more		1,814	1,856
Government Payments	farms	39,191	26,841
	$1,000	328,244	224,701
Total farm production expenses	$1,000	4,310,513	8,443,180
Average per farm	dollars	71,501	131,126
Net cash farm income of operation	$1,000	833,052	841,600
Average per farm	dollars	13,818	13,070

Source: National Agricultural Statistics Service

Table 2. Kansas and Indiana Ranked Items within the U.S., 2002

Item	Kansas			Indiana		
	Farms	Quantity[1]	U.S. Rank	Farms	Quantity	U.S. Rank
Livestock and Poultry Inventories:						
Cattle and calves	32,525	6,321,138	2	20,662	862,074	35
Hogs and pigs	1,648	1,520,996	9	4,087	3,478,570	5
Layers 20 weeks old and older	1,961	(D)[2]	(D)[2]	2,152	21,952,110	5
Broilers	374	18,536	42	572	3,823,936	25
Turkeys	231	881,121	21	423	3,848,054	8
Ducks	484	5,295	34	553	1,143,160	1
Pheasants	104	99,322	7	83	8,337	32
Crops Harvested:						
Corn for grain	9,552	2,494,179	10	24,156	5,123,291	5
Corn for silage	2,865	307,303	8	2,875	116,939	17
All Wheat for grain[3]	24,236	8,080,854	1	5,907	299,873	21
Sorghum for grain	15,086	2,863,487	1	94	9,950	16
Soybeans	13,622	2,534,974	11	25,212	5,761,363	4
Forage[4]	29,760	3,086,085	5	22,196	625,898	31

[1] Quantity represents number for livestock and poultry, and acres for selected crops.
[2] NASS withheld information to avoid disclosing data for individual farms.
[3] All wheat for grain equals winter wheat for grain in Indiana and Kansas because both states do not grow durum wheat and other spring wheat for grain.
[4] Land used for all hay and haylage, grass silage, and greenchop.
Source: National Agricultural Statistics Service

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Table 3. Expected Probability of Default for Each Credit Risk Variable (Percent)

Year	Credit Risk Classes			
	1	2	3	4
2002	6.98	3.69	1.54	0.86
2003	7.18	3.80	1.61	0.88
2004	7.61	3.68	1.48	0.74

Table 4. Systematic Method for Selecting Loan Requests

Lender	Loan 1	Loan 2	Loan 3	Loan 4
1	7	39	49	24
2	107	6	69	136
3	56	53	17	38
4	40	1	27	124
5	106	14	46	109
⋮	⋮	⋮	⋮	⋮
2502	119	1	9	70

Table 5. Summary of Response Rates by Financial Institutions

Lending Offices	Kansas	Indiana	Total
Commercial Banks	38.27%	52.00%	41.91%
Farm Credit Services	44.44%	32.14%	38.18%
Total	38.82%	48.41%	41.44%

Note: The calculations for the response rates are derived using the number of banks instead of the number of lending offices.

Table 6. Distribution of Responses to Hypothetical Agricultural Loan Requests

Factors and Levels	Kansas		Indiana	
	Frequency	Percent	Frequency	Percent
Character:				
Positive	238	50.53	130	53.28
Negative	233	49.47	114	46.72
FICO Score:				
725	232	49.26	129	52.87
560	239	50.74	115	47.13
Financial Record Keeping:				
Excellent	155	32.91	80	32.79
Average	168	35.67	83	34.02
Poor	148	31.42	81	33.20
Productive Standing:				
Upper Quartile	178	37.79	92	37.70
Middle	140	29.72	75	30.74
Lower Quartile	153	32.48	77	31.56
Credit Risk:				
1	131	27.81	53	21.72
2	129	27.39	60	24.59
3	110	23.35	66	27.05
4	101	21.44	65	26.64

Notes: The factors and levels correspond to those discussed in the Experimental Design section. The cumulative percent for some factors and levels does not equal one hundred percent because the percents shown are rounded to the nearest hundredth.

Table 7. Distribution of Decisions by Lenders Regarding Loan Approval or Denial

Decision	Kansas		Indiana	
	Frequency	Percent	Frequency	Percent
Approve	272	57.75	143	59.58
Deny	199	42.25	97	40.42

Table 8. Summary Statistics of Loan Amount, Interest Rate, and Terms

	Mean	Standard Deviation	Minimum	Maximum	No. of Observations
Kansas:					
Loan Amount – A & D	$44,994	$52,863	$0	$115,000	471
Loan Amount – A	$106,458	$7,163	$68,000	$115,000	197
Interest Rate	7.55%	0.77%	5.75%	9.75%	197
Years	6.27	0.92	4.50	7.00	197
Indiana:					
Loan Amount – A & D	$43,491	$53,160	$0	$110,000	240
Loan Amount – A	$107,449	$8,257	$50,000	$110,000	91
Interest Rate	7.17%	0.72%	5.60%	8.75%	91
Years	6.15	1.06	3.00	7.00	91

Notes: Loan Amount – A & D = the loan amount on both approved and denied loan requests. Loan Amount – A = the loan amount on loan requests that were approved.

Table 9. Summary Statistics of Comparisons of Differences in Typical Interest Rates

	Mean	Standard Deviation	Minimum	Maximum	No. of Observations
Kansas:					
Typical	0.0887%	0.4397%	-1.25%	2.00%	197
Indiana:					
Typical	0.1475%	0.4509%	-1.00%	2.00%	89

Note: The data presented in this table correspond to the differences between the interest rates offered by the lenders and their typical interest rates (i.e., how much higher or lower is this rate).

Table 10. Frequency and Percent Distribution of Score Card Utilization

Score Carded	Kansas		Indiana	
	Frequency	Percent	Frequency	Percent
Yes	145	30.79	138	59.23
No	326	69.21	95	40.77

Table 11. Summary Statistics of Responding Banks

Bank Characteristic	Mean	Standard Deviation	Minimum	Maximum	No. of Banks
Kansas:					
Total Assets	$5.46 B	$28.46 B	$0.0002 B	$195.00 B	113
Capital Asset Ratio	13.37%	10.97%	1.06%	100.00%	108
Agricultural Loan Ratio	46.62%	29.37%	1.60%	100.00%	110
Return on Assets	1.51%	1.01%	-0.77%	7.14%	105
Loan Deposit Ratio	71.78%	18.21%	31.00%	113.00%	100
Non-current Loans to Loans	1.65%	2.76%	0.00%	25.00%	105
Indiana:					
Total Assets	$46.85 B	$179.28 B	$0.0089 B	$1,157.25 B	53
Capital Asset Ratio	11.95%	6.53%	1.01%	50.00%	44
Agricultural Loan Ratio	27.10%	27.49%	0.40%	88.60%	46
Return on Assets	1.33%	0.53%	0.38%	2.40%	48
Loan Deposit Ratio	84.67%	14.52%	50.00%	112.00%	40
Non-current Loans to Loans	1.49%	1.89%	0.01%	11.16%	40

Notes: The number of banks varies across bank characteristics because (1) some of the responding lenders did not answer the specific question, and (2) the number of banks that provided their Loan Deposit Ratio only represents commercial bank lending offices. Farm Credit Services is not a depository institution; therefore, they do not have a loan deposit ratio.

Table 12. Summary Statistics for Responding Lenders

Loan Officer Characteristic	Mean	Standard Deviation	Minimum	Maximum	No. of Lenders
Kansas:					
EXP	16.03	9.10	0.67	40	116
PTIME	59.30%	28.56%	2.00%	100.00%	116
MLA	$324,912	$426,761	$0	$2,000,000	113
Indiana:					
EXP	17.54	9.54	1	37	59
PTIME	60.36%	32.75%	5.00%	100.00%	59
MLA	$662,222	$2,213,955	$0	$15,000,000	54

Notes: The number of lenders varies across loan officer characteristics because some of the responding lenders did not answer the specific question. *EXP* = agricultural lending experience, *PTIME* = time spent on agricultural lending, *MLA* = maximum lending authority.

Table 13. Regression Results from Tobit Model 1 for the Proportion of Loan Granted

Variable	Kansas		Indiana		All	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Intercept	-1.7064	0.0012***	-3.5242	0.0565*	-2.1659	<.0001***
CHAR	0.8130	0.0003***	0.7808	0.2653	0.7685	0.0007***
FICO	0.9814	<.0001***	3.3167	0.0019***	1.4261	<.0001***
EXCFRK	0.4078	0.1220	1.6065	0.0781*	0.7042	0.0107**
AVGFRK	0.0608	0.8135	0.9776	0.2312	0.3129	0.2351
PSUPQ	0.4376	0.0885*	-1.0768	0.2092	0.2107	0.4159
PSMID	0.4934	0.0693*	-1.1229	0.2056	0.2201	0.4202
CR3	1.3193	<.0001***	3.0858	0.0009***	1.6344	<.0001***
CR4	3.7685	<.0001***	7.8061	0.0004***	4.5208	<.0001***
ASSETSIZ	-0.0034	0.4582	-0.0023	0.4249	-0.0013	0.3740
ROA	-0.2328	0.0419**	-0.6505	0.3912	-0.2919	0.0291**
NCLTL	-0.0896	0.0129**	-0.3757	0.1191	-0.1106	0.0071***
EXP	-1.7064	0.0012***	-3.5242	0.0565*	-2.1659	<.0001***
PTIME	0.8130	0.0003***	0.7808	0.2653	0.7685	0.0007***
Σ	0.9814	<.0001***	3.3167	0.0019***	1.4261	<.0001***
L – Mean	0.5523		0.5304		0.5452	
L – Std. Error	0.4842		0.4939		0.4869	
Obs. Lower Bound	129		67		196	
Obs. Upper Bound	115		65		180	
Total Observations	229		145		444	
Log Likelihood	-233.52		-93.82		-339.51	

Note: Single, double, and triple asterisks (*) denote significance at the 10%, 5%, and 1% levels, respectively.

Table 14. Regression Results from Tobit Model 2 for the Proportion of Loan Granted

Variable	Kansas		Indiana		All	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
Intercept	1.75383	0.0001***	3.817192	0.0262**	2.007441	<.0001***
CHAR	0.81574	0.0003***	0.781842	0.2631	0.766789	0.0008***
FICO	0.96760	<.0001***	3.332429	0.0019***	1.419319	<.0001***
EXCFRK	0.40883	0.1208	1.613375	0.0764*	0.705109	0.0105**
AVGFRK	0.05196	0.8399	0.952115	0.2399	0.310854	0.2378
PSUPQ	0.43811	0.0880*	-1.040909	0.2184	0.206732	0.4236
PSMID	0.49246	0.0696*	-1.14671	0.1954	0.223183	0.4129
CR	-0.94457	<.0001***	-1.99974	0.0003***	-1.140764	<.0001***
ASSETSIZ	-0.00366	0.4219	-0.002395	0.4184	-0.001308	0.3766
ROA	-0.23133	0.0429**	-0.613854	0.4121	-0.292455	0.0286**
NCLTL	-0.09005	0.0124**	-0.373152	0.1178	-0.110866	0.0069***
EXP	-0.01159	0.3033	0.030864	0.3981	-0.004862	0.6693
PTIME	1.75383	0.0001***	3.817192	0.0262**	2.007441	<.0001***
Σ	0.81574	0.0003***	0.781842	0.2631	0.766789	0.0008***
L – Mean	0.4008		0.4179		0.4061	
L – Std. Error	0.4805		0.4890		0.4828	
Obs. Lower Bound	242		106		348	
Obs. Upper Bound	115		65		180	
Total Observations	412		184		596	
Log Likelihood	-233.84		-93.91		-339.76	

Note: Single, double, and triple asterisks (*) denote significance at the 10%, 5%, and 1% levels, respectively.

Table 15. Regression Results from Interest Rate Model 1 for Approved Loan Observations

Variable	Kansas		Indiana		All	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
Intercept	8.5151	<.0001***	8.2775	<.0001***	8.5253	<.0001***
CHAR	-0.1073	0.3530	-0.1652	0.3216	-0.1781	0.0639*
FICO	-0.2459	0.0327**	-0.3655	0.0524*	-0.2975	0.0024***
EXCFRK	-0.1294	0.3467	-0.3558	0.1296	-0.2512	0.0319**
AVGFRK	-0.1857	0.1675	-0.2255	0.3310	-0.2604	0.0247**
PSUPQ	-0.1730	0.1978	0.1123	0.5948	-0.0776	0.4908
PSMID	0.0194	0.8910	0.3276	0.1241	0.1127	0.3418
CR3	-0.1426	0.2191	-0.2092	0.2770	-0.1451	0.1390
CR4	-0.8561	0.0002***	-1.0096	0.0095***	-0.9294	<.0001***
ASSETSIZ	-0.0051	0.0343**	0.0003	0.6132	-0.0004	0.4599
ROA	-0.1778	0.0203**	-0.0878	0.6628	-0.1624	0.0216**
NCLTL	0.0281	0.1434	0.2405	0.0029***	0.0504	0.0071***
EXP	-0.0143	0.0191**	-0.0146	0.1457	-0.0119	0.0202**
PTIME	0.0046	0.0300***	-0.0019	0.4955	0.0027	0.1105
R-squared	0.2448		0.4026		0.2286	
Adj R-squared	0.1811		0.2687		0.1843	
F-Statistic	3.84		3.01		5.15	
RMSE	0.6986		0.6577		0.7104	
Total Observations	168		72		240	

Note: Single, double, and triple asterisks (*) denote significance at the 10%, 5%, and 1% levels, respectively.

Table 16. Regression Results from Interest Rate Model 2 for Approved Loan Observations

Variable	Kansas		Indiana		All	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Intercept	7.8054	<.0001***	7.4034	<.0001***	7.7655	<.0001***
CHAR	-0.1285	0.2710	-0.1900	0.2566	-0.1998	0.0410**
FICO	-0.2185	0.0593*	-0.3494	0.0651*	-0.2678	0.0069***
EXCFRK	-0.1390	0.3184	-0.3658	0.1224	-0.2628	0.0276**
AVGFRK	-0.1608	0.2363	-0.2423	0.3004	-0.2514	0.0332**
PSUPQ	-0.1693	0.2135	0.1522	0.4715	-0.0646	0.5732
PSMID	0.0178	0.9014	0.3162	0.1406	0.1020	0.3982
CR	0.2185	0.0002***	0.2659	0.0070***	0.2380	<.0001***
ASSETSIZ	-0.0044	0.0639*	0.0002	0.7135	-0.0005	0.3907
ROA	-0.1922	0.0131**	-0.1095	0.5892	-0.1772	0.0138**
NCLTL	0.0287	0.1394	0.2595	0.0013***	0.0534	0.0051***
EXP	-0.0160	0.0093***	-0.0131	0.1917	-0.0122	0.0197**
PTIME	0.0054	0.0105**	-0.0019	0.5001	0.0031	0.0701*
R-squared	0.2194		0.3812		0.1954	
Adj R-squared	0.1589		0.2553		0.1528	
F-Statistic	3.63		3.03		4.59	
RMSE	0.7080		0.6637		0.7240	
Total Observations	168		72		240	

Note: Single, double, and triple asterisks (*) denote significance at the 10%, 5%, and 1% levels, respectively.

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APPENDIX A: SURVEY INSTRUMENT

May 13, 2005

Dear Agricultural Lender:

Agricultural lenders in today's environment face many challenges when evaluating the creditworthiness of farm borrowers. To address these challenges, we are conducting a similar survey with financial institutions in both Indiana and Kansas that will provide a comparison of agricultural lending between the two states. We would greatly appreciate your voluntary assistance in completing and returning the enclosed survey.

The survey consists of four hypothetical agricultural loan requests. Each of the loan requests differs by the borrower's character, financial record keeping, productive standing, Fair Isaac credit bureau score, and credit risk. Please carefully review the farmer scenarios, borrowers' financials and ratio analyses, and then answer the questions in section four regarding the agricultural lending decision for each of the loan requests. Additionally, please answer the questions in sections five and six of the survey.

All responses to this survey are strictly confidential and will only be used in aggregate with those of other responding lenders for research purposes. Following the completion of this study, a summary report of the survey results will be compiled and made available to you, as indicated by your request on the survey. Additionally, results of the study may be presented at the Agricultural Banker's Clinic at Purdue University. We hope the results from this study will provide you with insight on factors that influence the decision making process of agricultural lenders in your area.

Please return your completed survey in the postage paid envelope **within ten days of receipt**. If you have any questions about this study, please do not hesitate to contact me. Thank you for your time and cooperation, and I look forward to hearing from you.

Sincerely,

Christine A. Wilson
Assistant Professor

Enclosures

I. FARMER CRAWFORD SCENARIO

Farmer Crawford is an established farmer who has operated an average sized grain farm in the local area throughout the past two decades. His wife is a clerk at the county court house and earns a salary of around $25,000 per year. They have two children who have both recently graduated from college, and are currently pursuing their own careers.

While re-evaluating his production practices and actions, Farmer Crawford discovered that he is in need of an additional tractor, which costs $135,000. He has $25,000 to use as a down payment. Farmer Crawford recently came to you as a new customer requesting a 7-year loan for the remaining $110,000.

During your meeting with Farmer Crawford, he provided you with his financial information. You currently know that Farmer Crawford is a poor financial record keeper but his operation ranks in the upper quartile in terms of productivity. You also currently know that his Fair Isaac credit bureau score is 725 points. In addition, when visiting with a number of individuals in the agricultural community, they all indicated that Farmer Crawford was honest in his business dealings.

II. BORROWER'S FINANCIALS

	Statements for the year ending December 31		
Item	2004	2003	2002
ASSETS			
Cash and equivalents	54,873	55,172	58,282
Total current assets	192,645	177,424	195,032
Intermediate-term assets	156,189	148,256	147,752
Long-term assets	469,745	454,415	445,083
Total assets	$818,579	$780,095	$787,867
LIABILITIES AND NET WORTH			
Current liabilities	150,175	152,144	160,255
Intermediate-term liabilities	90,377	75,978	80,859
Long-term liabilities	287,268	271,312	250,520
Total liabilities	$527,820	$499,433	$498,021
Net worth	$290,759	$280,662	$289,846
EARNINGS			
Farm revenue			
Value of farm production	$236,493	$197,477	$224,533
Farm expenses			
Cash operating expenses	158,739	142,288	157,215
Depreciation	19,273	19,208	22,078
Total farm operating expenses	$178,012	$161,496	$179,293
Interest	30,840	31,040	34,360
Total farm expenses	$208,852	$192,535	$213,653
Net farm income from operations	$27,641	$4,942	$10,880
OTHER INFORMATION			
Intermediate-term principal payments	$30,296	$24,593	$22,499
Long-term principal payments	$20,771	$16,583	$15,230

III. RATIO ANALYSIS

Measure	2004	2003	2002
LIQUIDITY			
Current Ratio (Current Assets ÷ Current Liabilities)	1.28	1.17	1.22
Working Capital (Current Assets – Current Liabilities)	42,470	25,280	34,777
SOLVENCY			
Debt-to-Asset Ratio (Total Liabilities ÷ Total Assets)	64.48%	64.02%	63.21%
Equity-to-Asset Ratio (Equity ÷ Total Assets)	35.52%	35.98%	36.79%
Debt-to-Equity Ratio (Total Liabilities ÷ Equity)	181.53%	177.95%	171.82%
PROFITABILITY			
Return on Farm Assets (NFIFO + Int. – Withdrawals) ÷ TA	2.48%	-0.29%	1.13%
Return on Farm Equity (NFIFO – Withdrawals) ÷ E	-3.62%	-11.87%	-8.78%
Operating Profit Margin (NFIFO + Int. – Withdrawals) ÷ VFP	8.59%	-1.15%	3.97%
REPAYMENT CAPACITY			
Term Debt Coverage Ratio (Net Cash + Term Int.) ÷ Annual Pmts.	69.09%	52.10%	69.87%
Term Debt Repayment Margin (Net Cash – Debt Repayments)	($25,318)	($34,589)	($21,718)
FINANCIAL EFFICIENCY			
Asset Turnover Ratio (Value of Farm Production ÷ TA)	28.89%	25.31%	28.50%
Operating Expense Ratio (Cash Operating Expenses ÷ VFP)	67.12%	72.05%	70.02%
Interest Expense Ratio (Interest ÷ VFP)	13.04%	15.72%	15.30%
Total Expense Ratio (Total Farm Expenses ÷ VFP)	88.31%	97.50%	95.15%
Net Farm Income Ratio (NFIFO ÷ VFP)	11.69%	2.50%	4.85%

IV. THE AGRICULTURAL LENDING DECISION

1. Would your institution approve or deny this loan?

☐ Approve ☐ Deny

2. If approved, what loan amount, interest rate and terms would you offer the borrower?

Loan Amount: $____________ Interest Rate: _________%

Terms: ____

3. Compared to your typical interest rate, how much higher or lower is this interest rate?

____

4. Would this loan be score carded in a typical situation, or has it been score carded?

____

5. Why did you **approve** or **deny** this loan? Please check all that apply.

☐ Character ☐ Financial Record Keeping ☐ Fair Isaac credit bureau score

☐ Credit Risk ☐ Productive Standing ☐ Other (specify): ____________

I. FARMER HOWARD SCENARIO

Farmer Howard is an established farmer who has operated an average sized grain farm in the local area throughout the past two decades. His wife is a clerk at the county court house and earns a salary of around $25,000 per year. They have two children who have both recently graduated from college, and are currently pursuing their own careers.

While re-evaluating his production practices and actions, Farmer Howard discovered that he is in need of an additional tractor, which costs $135,000. He has $25,000 to use as a down payment. Farmer Howard recently came to you as a new customer requesting a 7-year loan for the remaining $110,000.

During your meeting with Farmer Howard, he provided you with his financial information. You currently know that Farmer Howard is an average financial record keeper but his operation ranks in the lower quartile in terms of productivity. You also currently know that his Fair Isaac credit bureau score is 560 points. In addition, when visiting with a number of individuals in the agricultural community, they all indicated that Farmer Howard was honest in his business dealings.

II. BORROWER'S FINANCIALS

	Statements for the year ending December 31		
Item	2004	2003	2002
ASSETS			
Cash and equivalents	1,874	4,705	1,975
Total current assets	119,626	137,202	159,382
Intermediate-term assets	125,889	144,700	166,321
Long-term assets	624,030	607,270	590,510
Total assets	$869,545	$889,172	$916,213
LIABILITIES AND NET WORTH			
Current liabilities	114,626	136,872	136,782
Intermediate-term liabilities	103,440	130,080	154,932
Long-term liabilities	586,915	523,234	482,648
Total liabilities	$804,981	$790,186	$774,362
Net worth	$64,564	$98,985	$141,851
EARNINGS			
Farm revenue			
Value of farm production	$166,220	$145,864	$192,642
Farm expenses			
Cash operating expenses	125,077	111,513	133,819
Depreciation	18,811	21,622	24,853
Total farm operating expenses	$143,888	$133,135	$158,672
Interest	57,208	55,534	57,589
Total farm expenses	$201,096	$188,669	$216,261
Net farm income from operations	($34,876)	($42,805)	($23,619)
OTHER INFORMATION			
Intermediate-term principal payments	$26,640	$24,852	$23,183
Long-term principal payments	$22,209	$16,583	$10,761

III. RATIO ANALYSIS

Measure	2004	2003	2002
LIQUIDITY			
Current Ratio (Current Assets ÷ Current Liabilities)	1.04	1.00	1.17
Working Capital (Current Assets – Current Liabilities)	5,000	330	22,600
SOLVENCY			
Debt-to-Asset Ratio (Total Liabilities ÷ Total Assets)	92.58%	88.87%	84.52%
Equity-to-Asset Ratio (Equity ÷ Total Assets)	7.42%	11.13%	15.48%
Debt-to-Equity Ratio (Total Liabilities ÷ Equity)	1246.80%	798.29%	545.90%
PROFITABILITY			
Return on Farm Assets (NFIFO + Int. – Withdrawals) ÷ TA	-1.82%	-2.87%	-0.26%
Return on Farm Equity (NFIFO – Withdrawals) ÷ E	-113.12%	-81.88%	-42.25%
Operating Profit Margin (NFIFO + Int. – Withdrawals) ÷ VFP	-9.52%	-17.49%	-1.22%
REPAYMENT CAPACITY			
Term Debt Coverage Ratio (Net Cash + Term Int.) ÷ Annual Pmts.	17.49%	15.59%	47.53%
Term Debt Repayment Margin (Net Cash – Debt Repayments)	($126,221)	($99,439)	($48,026)
FINANCIAL EFFICIENCY			
Asset Turnover Ratio (Value of Farm Production ÷ TA)	19.12%	16.40%	21.03%
Operating Expense Ratio (Cash Operating Expenses ÷ VFP)	75.25%	76.45%	69.47%
Interest Expense Ratio (Interest ÷ VFP)	34.42%	38.07%	29.89%
Total Expense Ratio (Total Farm Expenses ÷ VFP)	120.98%	129.35%	112.26%
Net Farm Income Ratio (NFIFO ÷ VFP)	-20.98%	-29.35%	-12.26%

IV. THE AGRICULTURAL LENDING DECISION

1. Would your institution approve or deny this loan?

   ☐ Approve ☐ Deny

2. If approved, what loan amount, interest rate and terms would you offer the borrower?

   Loan Amount: $____________ Interest Rate: _________%

   Terms: ____

3. Compared to your typical interest rate, how much higher or lower is this interest rate?

   ____

4. Would this loan be score carded in a typical situation, or has it been score carded?

   ____

5. Why did you **approve** or **deny** this loan? Please check all that apply.

   ☐ Character ☐ Financial Record Keeping ☐ Fair Isaac credit bureau score

   ☐ Credit Risk ☐ Productive Standing ☐ Other (specify): ____________

I. FARMER MILLER SCENARIO

Farmer Miller is an established farmer who has operated an average sized grain farm in the local area throughout the past two decades. His wife is a clerk at the county court house and earns a salary of around $25,000 per year. They have two children who have both recently graduated from college, and are currently pursuing their own careers.

While re-evaluating his production practices and actions, Farmer Miller discovered that he is in need of an additional tractor, which costs $135,000. He has $25,000 to use as a down payment. Farmer Miller recently came to you as a new customer requesting a 7-year loan for the remaining $110,000.

During your meeting with Farmer Miller, he provided you with his financial information. You currently know that Farmer Miller is an excellent financial record keeper and his operation ranks in the middle in terms of productivity. You also currently know that his Fair Isaac credit bureau score is 725 points. In addition, when visiting with a number of individuals in the agricultural community, three expressed concerns regarding fairness in business transactions with Farmer Miller.

II. BORROWER'S FINANCIALS

	Statements for the year ending December 31		
Item	2004	2003	2002
ASSETS			
Cash and equivalents	79,304	70,791	74,081
Total current assets	221,217	208,501	217,442
Intermediate-term assets	161,971	155,342	154,814
Long-term assets	411,426	385,822	364,479
Total assets	$794,614	$749,665	$736,735
LIABILITIES AND NET WORTH			
Current liabilities	103,786	99,583	105,234
Intermediate-term liabilities	61,080	58,505	54,104
Long-term liabilities	102,091	96,284	91,828
Total liabilities	$266,957	$254,372	$251,166
Net worth	$527,657	$495,293	$485,569
EARNINGS			
Farm revenue			
Value of farm production	$235,059	$198,706	$214,664
Farm expenses			
Cash operating expenses	153,185	143,100	148,047
Depreciation	17,183	20,073	20,566
Total farm operating expenses	$170,368	$163,173	$168,613
Interest	15,888	16,186	15,901
Total farm expenses	$186,256	$179,359	$184,514
Net farm income from operations	$48,803	$19,347	$30,150
OTHER INFORMATION			
Intermediate-term principal payments	$21,237	$16,200	$12,240
Long-term principal payments	$9,357	$6,787	$5,548

III. RATIO ANALYSIS

Measure	2004	2003	2002
LIQUIDITY			
Current Ratio (Current Assets ÷ Current Liabilities)	2.13	2.09	2.07
Working Capital (Current Assets – Current Liabilities)	117,431	108,918	112,208
SOLVENCY			
Debt-to-Asset Ratio (Total Liabilities ÷ Total Assets)	33.60%	33.93%	34.09%
Equity-to-Asset Ratio (Equity ÷ Total Assets)	66.40%	66.07%	65.91%
Debt-to-Equity Ratio (Total Liabilities ÷ Equity)	50.59%	51.36%	51.73%
PROFITABILITY			
Return on Farm Assets (NFIFO + Int. – Withdrawals) ÷ TA	3.34%	-0.36%	1.32%
Return on Farm Equity (NFIFO – Withdrawals) ÷ E	2.02%	-3.82%	-1.27%
Operating Profit Margin (NFIFO + Int. – Withdrawals) ÷ VFP	11.29%	-1.37%	4.54%
REPAYMENT CAPACITY			
Term Debt Coverage Ratio (Net Cash + Term Int.) ÷ Annual Pmts.	119.66%	90.82%	140.25%
Term Debt Repayment Margin (Net Cash – Debt Repayments)	$8,513	($3,290)	$12,196
FINANCIAL EFFICIENCY			
Asset Turnover Ratio (Value of Farm Production ÷ TA)	29.58%	26.51%	29.14%
Operating Expense Ratio (Cash Operating Expenses ÷ VFP)	65.17%	72.02%	68.97%
Interest Expense Ratio (Interest ÷ VFP)	6.76%	8.15%	7.41%
Total Expense Ratio (Total Farm Expenses ÷ VFP)	79.24%	90.26%	85.95%
Net Farm Income Ratio (NFIFO ÷ VFP)	20.76%	9.74%	14.05%

IV. THE AGRICULTURAL LENDING DECISION

1. Would your institution approve or deny this loan?

   ☐ Approve ☐ Deny

2. If approved, what loan amount, interest rate and terms would you offer the borrower?

   Loan Amount: $____________ Interest Rate: _________%

   Terms: ____

3. Compared to your typical interest rate, how much higher or lower is this interest rate?

   ____

4. Would this loan be score carded in a typical situation, or has it been score carded?

   ____

5. Why did you **approve** or **deny** this loan? Please check all that apply.

   ☐ Character ☐ Financial Record Keeping ☐ Fair Isaac credit bureau score

   ☐ Credit Risk ☐ Productive Standing ☐ Other (specify): ____________

I. FARMER YOUNG SCENARIO

Farmer Young is an established farmer who has operated an average sized grain farm in the local area throughout the past two decades. His wife is a clerk at the county court house and earns a salary of around $25,000 per year. They have two children who have both recently graduated from college, and are currently pursuing their own careers.

While re-evaluating his production practices and actions, Farmer Young discovered that he is in need of an additional tractor, which costs $135,000. He has $25,000 to use as a down payment. Farmer Young recently came to you as a new customer requesting a 7-year loan for the remaining $110,000.

During your meeting with Farmer Young, he provided you with his financial information. You currently know that Farmer Young is a poor financial record keeper and his operation ranks in the lower quartile in terms of productivity. You also currently know that his Fair Isaac credit bureau score is 560 points. In addition, when visiting with a number of individuals in the agricultural community, three expressed concerns regarding fairness in business transactions with Farmer Young.

II. BORROWER'S FINANCIALS

	Statements for the year ending December 31		
Item	2004	2003	2002
ASSETS			
Cash and equivalents	86,456	54,949	40,995
Total current assets	215,022	174,946	171,725
Intermediate-term assets	167,464	160,610	160,064
Long-term assets	609,918	589,723	569,510
Total assets	$992,404	$925,279	$901,299
LIABILITIES AND NET WORTH			
Current liabilities	32,234	23,665	34,398
Intermediate-term liabilities	23,747	22,746	21,095
Long-term liabilities	120,687	113,822	105,114
Total liabilities	$176,668	$160,233	$160,607
Net worth	$815,736	$765,046	$740,692
EARNINGS			
Farm revenue			
Value of farm production	$312,290	$265,994	$279,254
Farm expenses			
Cash operating expenses	194,443	183,642	187,921
Depreciation	20,879	20,808	21,676
Total farm operating expenses	$215,322	$204,450	$209,597
Interest	15,083	15,018	15,997
Total farm expenses	$230,405	$219,469	$225,594
Net farm income from operations	$81,885	$46,525	$53,660
OTHER INFORMATION			
Intermediate-term principal payments	$8,411	$6,417	$5,871
Long-term principal payments	$8,714	$6,958	$6,390

III. RATIO ANALYSIS

Measure	2004	2003	2002
LIQUIDITY			
Current Ratio (Current Assets ÷ Current Liabilities)	6.67	7.39	4.99
Working Capital (Current Assets – Current Liabilities)	182,788	151,281	137,327
SOLVENCY			
Debt-to-Asset Ratio (Total Liabilities ÷ Total Assets)	17.80%	17.32%	17.82%
Equity-to-Asset Ratio (Equity ÷ Total Assets)	82.20%	82.68%	82.18%
Debt-to-Equity Ratio (Total Liabilities ÷ Equity)	21.66%	20.94%	21.68%
PROFITABILITY			
Return on Farm Assets (NFIFO + Int. – Withdrawals) ÷ TA	5.93%	2.52%	3.70%
Return on Farm Equity (NFIFO – Withdrawals) ÷ E	5.36%	1.08%	2.34%
Operating Profit Margin (NFIFO + Int. – Withdrawals) ÷ VFP	18.83%	8.76%	11.94%
REPAYMENT CAPACITY			
Term Debt Coverage Ratio (Net Cash + Term Int.) ÷ Annual Pmts.	254.71%	195.94%	227.38%
Term Debt Repayment Margin (Net Cash – Debt Repayments)	$49,829	$27,240	$35,996
FINANCIAL EFFICIENCY			
Asset Turnover Ratio (Value of Farm Production ÷ TA)	31.47%	28.75%	30.98%
Operating Expense Ratio (Cash Operating Expenses ÷ VFP)	62.26%	69.04%	67.29%
Interest Expense Ratio (Interest ÷ VFP)	4.83%	5.65%	5.73%
Total Expense Ratio (Total Farm Expenses ÷ VFP)	73.78%	82.51%	80.78%
Net Farm Income Ratio (NFIFO ÷ VFP)	26.22%	17.49%	19.22%

IV. THE AGRICULTURAL LENDING DECISION

1. Would your institution approve or deny this loan?

☐ Approve ☐ Deny

2. If approved, what loan amount, interest rate and terms would you offer the borrower?

Loan Amount: $____________ Interest Rate: _________%

Terms: ____

3. Compared to your typical interest rate, how much higher or lower is this interest rate?

____

4. Would this loan be score carded in a typical situation, or has it been score carded?

____

5. Why did you **approve** <u>or</u> **deny** this loan? Please check all that apply.

☐ Character ☐ Financial Record Keeping ☐ Fair Isaac credit bureau score

☐ Credit Risk ☐ Productive Standing ☐ Other (specify): ____________

V. BANK CHARACTERISTICS

5. Total Assets: $____________

6. Capital/Asset Ratio: _________%

7. Ag Loans/Total Loans Ratio: _________%

8. Return on Assets: _________%

9. Loan/Deposit Ratio: _________%

10. Non-Current Loans/Total Loans Ratio: _________%

11. County and State in which the bank is located: ______________________

VI. LOAN OFFICER CHARACTERISTICS

12. How many years have you been involved in agricultural lending? __________

13. What percentage of your time is taken by agricultural loans? _________%

14. What is your maximum individual lending authority? $____________

15. Which of the following best describes the decision making process that you employ as a loan officer?

    ☐ You tend to base your decisions on logic and on objective analysis of cause and effect

    ☐ You tend to base your decisions primarily on values and on subjective evaluation of person-centered concerns

Thank you very much for your time and cooperation in completing this survey!

If you would like a summary of the results, please attach a business card here. You will receive a summary report when the results are compiled. If there are any additional comments that you would like to make, please write them in the space below.

APPENDIX B: CREDIT SCORING MODEL

Table B.1: Expected Probability of Default Results from Credit Scoring Model

Variable	Roessler's Estimate	Credit Risk Class											
		1			2			3			4		
		2004	*2003*	*2002*	*2004*	*2003*	*2002*	*2004*	*2003*	*2002*	*2004*	*2003*	*2002*
Intercept	-2.3643												
CDRC	-0.00135	(30.49)	(34.95)	(12.44)	43.69	25.79	27.28	142.47	69.91	115.46	379.86	247.31	300.56
OE	-0.0217	7.42	11.13	11.13	35.52	35.98	36.79	66.40	66.07	65.91	82.20	82.68	82.18
WC	-0.00399	3.01	0.23	0.23	17.96	12.80	15.49	49.96	54.81	52.27	58.53	56.87	49.18
Xb		(2.50)	(2.56)	(2.59)	(3.27)	(3.23)	(3.26)	(4.20)	(4.11)	(4.16)	(4.89)	(4.72)	(4.75)
Expected Prob. of Default		7.61	7.18	6.98	3.68	3.80	3.69	1.48	1.61	1.54	0.74	0.88	0.86

Calculations

$$\text{CDRC Percentage} = \frac{\text{Net farm income from operations} + \text{Non-Farm Wage} + \text{Depreciation} - \text{Income Taxes} - \text{Unpaid Family \& Operator Labor}}{\left[(\text{Intermediate-Term Liabilities}/4) + (\text{Long-Term Liabilities}/20) + (\text{Interest}) + (\text{Working Capital Deficiency})\right] \times 100}$$

$$\text{Owner Equity Percentage} = \left(\frac{\text{Net Worth}}{\text{Total Assets}}\right) \times 100$$

$$\text{Working Capital Percentage} = \left(\frac{\text{Working Capital}}{\text{Value of Farm Production}}\right) \times 100$$

Table B.2: Financial Information Used in Calculating Expected Probability of Default

Variable	Credit Risk Class											
	1			2			3			4		
	2004	*2003*	*2002*	*2004*	*2003*	*2002*	*2004*	*2003*	*2002*	*2004*	*2003*	*2002*
Non-Farm Wage	$25,000	$24,500	$24,000	$25,000	$24,500	$24,000	$25,000	$24,500	$24,000	$25,000	$24,500	$ 24,000
Income Taxes	$3,150	$3,075	$3,000	$8,009	$3,816	$4,632	$13,723	$5,977	$8,416	$22,655	$12,973	$14,764
Unpaid Family & Operator Labor	$38,156	$38,246	$36,315	$38,156	$38,246	$36,315	$38,156	$38,246	$36,315	$38,156	$38,246	$36,315
Working Capital Target	$24,933	$21,880	$28,896	$35,474	$29,622	$33,680	$35,259	$29,806	$32,200	$46,844	$39,899	$41,888
Working Capital Deficiency	($6,233)	($5,470)	($7,224)	($8,868)	($7,405)	($8,420)	($8,814)	($7,451)	($8,049)	($11,709)	($9,973)	($10,471)

Calculations

$$\text{Working Capital Target} = \text{Value of Farm Production} \times 15\%$$

$$\text{Working Capital Deficiency} = \left(\frac{\text{Working Capital Target - Working Capital}}{4}\right)$$

Income				Tax Rate
$	0	-	$ 12,000	10%
$	12,001	-	$ 46,700	15%
$	46,701	-	$ 112,850	27%
$	112,851	-	$ 171,950	30%
$	171,951	-	$ 307,050	35%
$	307,051	-	+	39%

APPENDIX C: LENDER RESPONSES AND COMMENTS

Table C.1: Key to Hypothetical Agricultural Loan Requests

Scenario Number	Last Name	Character	FICO Score	Financial Record Keeping	Productivity Standing	Credit Risk
1	Adams	Honest	725	Excellent	Upper Quartile	1
2	Allen	Honest	725	Excellent	Upper Quartile	2
3	Anderson	Honest	725	Excellent	Upper Quartile	3
4	Bailey	Honest	725	Excellent	Upper Quartile	4
5	Baker	Honest	725	Excellent	Middle	1
6	Barnes	Honest	725	Excellent	Middle	2
7	Bell	Honest	725	Excellent	Middle	3
8	Bennett	Honest	725	Excellent	Middle	4
9	Berry	Honest	725	Excellent	Lower Quartile	1
10	Black	Honest	725	Excellent	Lower Quartile	2
11	Boyd	Honest	725	Excellent	Lower Quartile	3
12	Brooks	Honest	725	Excellent	Lower Quartile	4
13	Brown	Honest	725	Average	Upper Quartile	1
14	Bryant	Honest	725	Average	Upper Quartile	2
15	Burns	Honest	725	Average	Upper Quartile	3
16	Butler	Honest	725	Average	Upper Quartile	4
17	Campbell	Honest	725	Average	Middle	1
18	Carter	Honest	725	Average	Middle	2
19	Clark	Honest	725	Average	Middle	3
20	Cole	Honest	725	Average	Middle	4
21	Coleman	Honest	725	Average	Lower Quartile	1
22	Collins	Honest	725	Average	Lower Quartile	2
23	Cook	Honest	725	Average	Lower Quartile	3
24	Cooper	Honest	725	Average	Lower Quartile	4
25	Cox	Honest	725	Poor	Upper Quartile	1
26	Crawford	Honest	725	Poor	Upper Quartile	2
27	Daniels	Honest	725	Poor	Upper Quartile	3
28	Davis	Honest	725	Poor	Upper Quartile	4
29	Dixon	Honest	725	Poor	Middle	1

Table C.1: Key to Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Character	FICO Score	Financial Record Keeping	Productivity Standing	Credit Risk
30	Dunn	Honest	725	Poor	Middle	2
31	Edwards	Honest	725	Poor	Middle	3
32	Evans	Honest	725	Poor	Middle	4
33	Ferguson	Honest	725	Poor	Lower Quartile	1
34	Fisher	Honest	725	Poor	Lower Quartile	2
35	Ford	Honest	725	Poor	Lower Quartile	3
36	Foster	Honest	725	Poor	Lower Quartile	4
37	Freeman	Honest	560	Excellent	Upper Quartile	1
38	Gardner	Honest	560	Excellent	Upper Quartile	2
39	Gibson	Honest	560	Excellent	Upper Quartile	3
40	Gordon	Honest	560	Excellent	Upper Quartile	4
41	Graham	Honest	560	Excellent	Middle	1
42	Grant	Honest	560	Excellent	Middle	2
43	Gray	Honest	560	Excellent	Middle	3
44	Green	Honest	560	Excellent	Middle	4
45	Griffin	Honest	560	Excellent	Lower Quartile	1
46	Hall	Honest	560	Excellent	Lower Quartile	2
47	Hamilton	Honest	560	Excellent	Lower Quartile	3
48	Harris	Honest	560	Excellent	Lower Quartile	4
49	Harrison	Honest	560	Average	Upper Quartile	1
50	Hawkins	Honest	560	Average	Upper Quartile	2
51	Hayes	Honest	560	Average	Upper Quartile	3
52	Henderson	Honest	560	Average	Upper Quartile	4
53	Henry	Honest	560	Average	Middle	1
54	Hicks	Honest	560	Average	Middle	2
55	Hill	Honest	560	Average	Middle	3
56	Holmes	Honest	560	Average	Middle	4
57	Howard	Honest	560	Average	Lower Quartile	1
58	Hudson	Honest	560	Average	Lower Quartile	2
59	Hughes	Honest	560	Average	Lower Quartile	3

Table C.1: Key to Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Character	FICO Score	Financial Record Keeping	Productivity Standing	Credit Risk
60	Hunt	Honest	560	Average	Lower Quartile	4
61	Hunter	Honest	560	Poor	Upper Quartile	1
62	Jackson	Honest	560	Poor	Upper Quartile	2
63	James	Honest	560	Poor	Upper Quartile	3
64	Jenkins	Honest	560	Poor	Upper Quartile	4
65	Johnson	Honest	560	Poor	Middle	1
66	Jones	Honest	560	Poor	Middle	2
67	Jordan	Honest	560	Poor	Middle	3
68	Kelly	Honest	560	Poor	Middle	4
69	Kennedy	Honest	560	Poor	Lower Quartile	1
70	King	Honest	560	Poor	Lower Quartile	2
71	Knight	Honest	560	Poor	Lower Quartile	3
72	Lee	Honest	560	Poor	Lower Quartile	4
73	Lewis	Dishonest	725	Excellent	Upper Quartile	1
74	Long	Dishonest	725	Excellent	Upper Quartile	2
75	Marshall	Dishonest	725	Excellent	Upper Quartile	3
76	Martin	Dishonest	725	Excellent	Upper Quartile	4
77	Mason	Dishonest	725	Excellent	Middle	1
78	McDonald	Dishonest	725	Excellent	Middle	2
79	Miller	Dishonest	725	Excellent	Middle	3
80	Mills	Dishonest	725	Excellent	Middle	4
81	Mitchell	Dishonest	725	Excellent	Lower Quartile	1
82	Moore	Dishonest	725	Excellent	Lower Quartile	2
83	Morgan	Dishonest	725	Excellent	Lower Quartile	3
84	Morris	Dishonest	725	Excellent	Lower Quartile	4
85	Murphy	Dishonest	725	Average	Upper Quartile	1
86	Murray	Dishonest	725	Average	Upper Quartile	2
87	Myers	Dishonest	725	Average	Upper Quartile	3
88	Nelson	Dishonest	725	Average	Upper Quartile	4
89	Nichols	Dishonest	725	Average	Middle	1

Table C.1: Key to Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Character	FICO Score	Financial Record Keeping	Productivity Standing	Credit Risk
90	Owens	Dishonest	725	Average	Middle	2
91	Palmer	Dishonest	725	Average	Middle	3
92	Parker	Dishonest	725	Average	Middle	4
93	Patterson	Dishonest	725	Average	Lower Quartile	1
94	Payne	Dishonest	725	Average	Lower Quartile	2
95	Perkins	Dishonest	725	Average	Lower Quartile	3
96	Perry	Dishonest	725	Average	Lower Quartile	4
97	Peterson	Dishonest	725	Poor	Upper Quartile	1
98	Phillips	Dishonest	725	Poor	Upper Quartile	2
99	Porter	Dishonest	725	Poor	Upper Quartile	3
100	Powell	Dishonest	725	Poor	Upper Quartile	4
101	Price	Dishonest	725	Poor	Middle	1
102	Reed	Dishonest	725	Poor	Middle	2
103	Reynolds	Dishonest	725	Poor	Middle	3
104	Rice	Dishonest	725	Poor	Middle	4
105	Richardson	Dishonest	725	Poor	Lower Quartile	1
106	Roberts	Dishonest	725	Poor	Lower Quartile	2
107	Robertson	Dishonest	725	Poor	Lower Quartile	3
108	Robinson	Dishonest	725	Poor	Lower Quartile	4
109	Rogers	Dishonest	560	Excellent	Upper Quartile	1
110	Rose	Dishonest	560	Excellent	Upper Quartile	2
111	Ross	Dishonest	560	Excellent	Upper Quartile	3
112	Russell	Dishonest	560	Excellent	Upper Quartile	4
113	Sanders	Dishonest	560	Excellent	Middle	1
114	Scott	Dishonest	560	Excellent	Middle	2
115	Shaw	Dishonest	560	Excellent	Middle	3
116	Simmons	Dishonest	560	Excellent	Middle	4
117	Simpson	Dishonest	560	Excellent	Lower Quartile	1
118	Smith	Dishonest	560	Excellent	Lower Quartile	2
119	Stephens	Dishonest	560	Excellent	Lower Quartile	3

Table C.1: Key to Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Character	FICO Score	Financial Record Keeping	Productivity Standing	Credit Risk
120	Stevens	Dishonest	560	Excellent	Lower Quartile	4
121	Stewart	Dishonest	560	Average	Upper Quartile	1
122	Stone	Dishonest	560	Average	Upper Quartile	2
123	Sullivan	Dishonest	560	Average	Upper Quartile	3
124	Taylor	Dishonest	560	Average	Upper Quartile	4
125	Thomas	Dishonest	560	Average	Middle	1
126	Thompson	Dishonest	560	Average	Middle	2
127	Tucker	Dishonest	560	Average	Middle	3
128	Turner	Dishonest	560	Average	Middle	4
129	Walker	Dishonest	560	Average	Lower Quartile	1
130	Wallace	Dishonest	560	Average	Lower Quartile	2
131	Ward	Dishonest	560	Average	Lower Quartile	3
132	Warren	Dishonest	560	Average	Lower Quartile	4
133	Washington	Dishonest	560	Poor	Upper Quartile	1
134	Watson	Dishonest	560	Poor	Upper Quartile	2
135	Webb	Dishonest	560	Poor	Upper Quartile	3
136	Wells	Dishonest	560	Poor	Upper Quartile	4
137	West	Dishonest	560	Poor	Middle	1
138	White	Dishonest	560	Poor	Middle	2
139	Williams	Dishonest	560	Poor	Middle	3
140	Wilson	Dishonest	560	Poor	Middle	4
141	Wood	Dishonest	560	Poor	Lower Quartile	1
142	Woods	Dishonest	560	Poor	Lower Quartile	2
143	Wright	Dishonest	560	Poor	Lower Quartile	3
144	Young	Dishonest	560	Poor	Lower Quartile	4

Table C.2: Distribution of Responses Obtained from Kansas Lenders on the Combinations of Hypothetical Agricultural Loan Requests

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
1	Adams	3	3	0.64	0.64
2	Allen	5	8	1.06	1.70
3	Anderson	3	11	0.64	2.34
4	Bailey	0	11	0.00	2.34
5	Baker	5	16	1.06	3.40
6	Barnes	5	21	1.06	4.46
7	Bell	5	26	1.06	5.52
8	Bennett	2	28	0.42	5.94
9	Berry	4	32	0.85	6.79
10	Black	3	35	0.64	7.43
11	Boyd	2	37	0.42	7.86
12	Brooks	3	40	0.64	8.49
13	Brown	4	44	0.85	9.34
14	Bryant	1	45	0.21	9.55
15	Burns	4	49	0.85	10.40
16	Butler	0	49	0.00	10.40
17	Campbell	6	55	1.27	11.68
18	Carter	3	58	0.64	12.31
19	Clark	5	63	1.06	13.38
20	Cole	4	67	0.85	14.23
21	Coleman	5	72	1.06	15.29
22	Collins	4	76	0.85	16.14
23	Cook	4	80	0.85	16.99
24	Cooper	4	84	0.85	17.83
25	Cox	3	87	0.64	18.47
26	Crawford	4	91	0.85	19.32
27	Daniels	4	95	0.85	20.17
28	Davis	5	100	1.06	21.23
9	Dixon	3	103	0.64	21.87

Table C.2: Distribution of Responses Obtained from Kansas Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
30	Dunn	3	106	0.64	22.51
31	Edwards	1	107	0.21	22.72
32	Evans	5	112	1.06	23.78
33	Ferguson	1	113	0.21	23.99
34	Fisher	1	114	0.21	24.20
35	Ford	8	122	1.70	25.90
36	Foster	1	123	0.21	26.11
37	Freeman	5	128	1.06	27.18
38	Gardner	4	132	0.85	28.03
39	Gibson	1	133	0.21	28.24
40	Gordon	2	135	0.42	28.66
41	Graham	5	140	1.06	29.72
42	Grant	3	143	0.64	30.36
43	Gray	1	144	0.21	30.57
44	Green	3	147	0.64	31.21
45	Griffin	2	149	0.42	31.63
46	Hall	7	156	1.49	33.12
47	Hamilton	2	158	0.42	33.55
48	Harris	4	162	0.85	34.39
49	Harrison	2	164	0.42	34.82
50	Hawkins	5	169	1.06	35.88
51	Hayes	2	171	0.42	36.31
52	Henderson	5	176	1.06	37.37
53	Henry	4	180	0.85	38.22
54	Hicks	3	183	0.64	38.85
55	Hill	5	188	1.06	39.92
56	Holmes	2	190	0.42	40.34
57	Howard	5	195	1.06	41.40
58	Hudson	3	198	0.64	42.04
9	Hughes	2	200	0.42	42.46

Table C.2: Distribution of Responses Obtained from Kansas Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
60	Hunt	2	202	0.42	42.89
61	Hunter	4	206	0.85	43.74
62	Jackson	2	208	0.42	44.16
63	James	5	213	1.06	45.22
64	Jenkins	4	217	0.85	46.07
65	Johnson	4	221	0.85	46.92
66	Jones	6	227	1.27	48.20
67	Jordan	0	227	0.00	48.20
68	Kelly	3	230	0.64	48.83
69	Kennedy	2	232	0.42	49.26
70	King	2	234	0.42	49.68
71	Knight	1	235	0.21	49.89
72	Lee	3	238	0.64	50.53
73	Lewis	1	239	0.21	50.74
74	Long	4	243	0.85	51.59
75	Marshall	4	247	0.85	52.44
76	Martin	3	250	0.64	53.08
77	Mason	1	251	0.21	53.29
78	McDonald	3	254	0.64	53.93
79	Miller	1	255	0.21	54.14
80	Mills	0	255	0.00	54.14
81	Mitchell	4	259	0.85	54.99
82	Moore	4	263	0.85	55.84
83	Morgan	4	267	0.85	56.69
84	Morris	2	269	0.42	57.11
85	Murphy	5	274	1.06	58.17
86	Murray	6	280	1.27	59.45
87	Myers	4	284	0.85	60.30
88	Nelson	4	288	0.85	61.15
89	Nichols	2	290	0.42	61.57

Table C.2: Distribution of Responses Obtained from Kansas Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
90	Owens	2	292	0.42	62.00
91	Palmer	1	293	0.21	62.21
92	Parker	1	294	0.21	62.42
93	Patterson	3	297	0.64	63.06
94	Payne	1	298	0.21	63.27
95	Perkins	4	302	0.85	64.12
96	Perry	3	305	0.64	64.76
97	Peterson	5	310	1.06	65.82
98	Phillips	9	319	1.91	67.73
99	Porter	2	321	0.42	68.15
100	Powell	4	325	0.85	69.00
101	Price	0	325	0.00	69.00
102	Reed	3	328	0.64	69.64
103	Reynolds	4	332	0.85	70.49
104	Rice	1	333	0.21	70.70
105	Richardson	3	336	0.64	71.34
106	Roberts	3	339	0.64	71.97
107	Robertson	3	342	0.64	72.61
108	Robinson	5	347	1.06	73.67
109	Rogers	8	355	1.70	75.37
110	Rose	4	359	0.85	76.22
111	Ross	3	362	0.64	76.86
112	Russell	5	367	1.06	77.92
113	Sanders	7	374	1.49	79.41
114	Scott	2	376	0.42	79.83
115	Shaw	1	377	0.21	80.04
116	Simmons	3	380	0.64	80.68
117	Simpson	4	384	0.85	81.53
118	Smith	3	387	0.64	82.17
119	Stephens	3	390	0.64	82.80

Table C.2: Distribution of Responses Obtained from Kansas Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
120	Stevens	2	392	0.42	83.23
121	Stewart	5	397	1.06	84.29
122	Stone	6	403	1.27	85.56
123	Sullivan	7	410	1.49	87.05
124	Taylor	4	414	0.85	87.90
125	Thomas	2	416	0.42	88.32
126	Thompson	3	419	0.64	88.96
127	Tucker	5	424	1.06	90.02
128	Turner	2	426	0.42	90.45
129	Walker	6	432	1.27	91.72
130	Wallace	6	438	1.27	92.99
131	Ward	1	439	0.21	93.21
132	Warren	1	440	0.21	93.42
133	Washington	5	445	1.06	94.48
134	Watson	1	446	0.21	94.69
135	Webb	1	447	0.21	94.90
136	Wells	1	448	0.21	95.12
137	West	1	449	0.21	95.33
138	White	3	452	0.64	95.97
139	Williams	3	455	0.64	96.60
140	Wilson	3	458	0.64	97.24
141	Wood	2	460	0.42	97.66
142	Woods	2	462	0.42	98.09
143	Wright	4	466	0.85	98.94
144	Young	5	471	1.06	100.00

Table C.3: Distribution of Responses Obtained from Indiana Lenders on the Combinations of Hypothetical Agricultural Loan Requests

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
1	Adams	4	4	1.64	1.64
2	Allen	0	4	0.00	1.64
3	Anderson	3	7	1.23	2.87
4	Bailey	4	11	1.64	4.51
5	Baker	0	11	0.00	4.51
6	Barnes	4	15	1.64	6.15
7	Bell	1	16	0.41	6.56
8	Bennett	3	19	1.23	7.79
9	Berry	1	20	0.41	8.20
10	Black	1	21	0.41	8.61
11	Boyd	3	24	1.23	9.84
12	Brooks	2	26	0.82	10.66
13	Brown	2	28	0.82	11.48
14	Bryant	2	30	0.82	12.30
15	Burns	5	35	2.05	14.34
16	Butler	2	37	0.82	15.16
17	Campbell	0	37	0.00	15.16
18	Carter	0	37	0.00	15.16
19	Clark	5	42	2.05	17.21
20	Cole	1	43	0.41	17.62
21	Coleman	2	45	0.82	18.44
22	Collins	1	46	0.41	18.85
23	Cook	1	47	0.41	19.26
24	Cooper	2	49	0.82	20.08
25	Cox	5	54	2.05	22.13
26	Crawford	4	58	1.64	23.77
27	Daniels	2	60	0.82	24.59
28	Davis	1	61	0.41	25.00
29	Dixon	2	63	0.82	25.82

Table C.3: Distribution of Responses Obtained from Indiana Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
30	Dunn	2	65	0.82	26.64
31	Edwards	0	65	0.00	26.64
32	Evans	3	68	1.23	27.87
33	Ferguson	0	68	0.00	27.87
34	Fisher	2	70	0.82	28.69
35	Ford	0	70	0.00	28.69
36	Foster	3	73	1.23	29.92
37	Freeman	0	73	0.00	29.92
38	Gardner	1	74	0.41	30.33
39	Gibson	3	77	1.23	31.56
40	Gordon	1	78	0.41	31.97
41	Graham	1	79	0.41	32.38
42	Grant	4	83	1.64	34.02
43	Gray	3	86	1.23	35.25
44	Green	1	87	0.41	35.66
45	Griffin	4	91	1.64	37.30
46	Hall	2	93	0.82	38.11
47	Hamilton	1	94	0.41	38.52
48	Harris	2	96	0.82	39.34
49	Harrison	3	99	1.23	40.57
50	Hawkins	2	101	0.82	41.39
51	Hayes	2	103	0.82	42.21
52	Henderson	2	105	0.82	43.03
53	Henry	3	108	1.23	44.26
54	Hicks	1	109	0.41	44.67
55	Hill	0	109	0.00	44.67
56	Holmes	1	110	0.41	45.08
57	Howard	0	110	0.00	45.08
58	Hudson	1	111	0.41	45.49
59	Hughes	1	112	0.41	45.90

Table C.3: Distribution of Responses Obtained from Indiana Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
60	Hunt	3	115	1.23	47.13
61	Hunter	1	116	0.41	47.54
62	Jackson	0	116	0.00	47.54
63	James	1	117	0.41	47.95
64	Jenkins	3	120	1.23	49.18
65	Johnson	0	120	0.00	49.18
66	Jones	2	122	0.82	50.00
67	Jordan	2	124	0.82	50.82
68	Kelly	3	127	1.23	52.05
69	Kennedy	0	127	0.00	52.05
70	King	1	128	0.41	52.46
71	Knight	0	128	0.00	52.46
72	Lee	2	130	0.82	53.28
73	Lewis	0	130	0.00	53.28
74	Long	1	131	0.41	53.69
75	Marshall	2	133	0.82	54.51
76	Martin	1	134	0.41	54.92
77	Mason	0	134	0.00	54.92
78	McDonald	1	135	0.41	55.33
79	Miller	2	137	0.82	56.15
80	Mills	1	138	0.41	56.56
81	Mitchell	6	144	2.46	59.02
82	Moore	1	145	0.41	59.43
83	Morgan	1	146	0.41	59.84
84	Morris	1	147	0.41	60.25
85	Murphy	2	149	0.82	61.07
86	Murray	3	152	1.23	62.30
87	Myers	3	155	1.23	63.52
88	Nelson	4	159	1.64	65.16
89	Nichols	2	161	0.82	65.98

Table C.3: Distribution of Responses Obtained from Indiana Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
90	Owens	1	162	0.41	66.39
91	Palmer	2	164	0.82	67.21
92	Parker	1	165	0.41	67.62
93	Patterson	1	166	0.41	68.03
94	Payne	3	169	1.23	69.26
95	Perkins	0	169	0.00	69.26
96	Perry	0	169	0.00	69.26
97	Peterson	1	170	0.41	69.67
98	Phillips	2	172	0.82	70.49
99	Porter	1	173	0.41	70.90
100	Powell	1	174	0.41	71.31
101	Price	2	176	0.82	72.13
102	Reed	2	178	0.82	72.95
103	Reynolds	2	180	0.82	73.77
104	Rice	1	181	0.41	74.18
105	Richardson	2	183	0.82	75.00
106	Roberts	0	183	0.00	75.00
107	Robertson	2	185	0.82	75.82
108	Robinson	1	186	0.41	76.23
109	Rogers	0	186	0.00	76.23
110	Rose	1	187	0.41	76.64
111	Ross	1	188	0.41	77.05
112	Russell	1	189	0.41	77.46
113	Sanders	0	189	0.00	77.46
114	Scott	2	191	0.82	78.28
115	Shaw	2	193	0.82	79.10
116	Simmons	0	193	0.00	79.10
117	Simpson	0	193	0.00	79.10
118	Smith	1	194	0.41	79.51
119	Stephens	2	196	0.82	80.33

Table C.3: Distribution of Responses Obtained from Indiana Lenders on the Combinations of Hypothetical Agricultural Loan Requests (Continued)

Scenario Number	Last Name	Frequency	Cumulative Frequency	Percent	Cumulative Percent
120	Stevens	4	200	1.64	81.97
121	Stewart	3	203	1.23	83.20
122	Stone	1	204	0.41	83.61
123	Sullivan	2	206	0.82	84.43
124	Taylor	1	207	0.41	84.84
125	Thomas	1	208	0.41	85.25
126	Thompson	0	208	0.00	85.25
127	Tucker	0	208	0.00	85.25
128	Turner	5	213	2.05	87.30
129	Walker	1	214	0.41	87.70
130	Wallace	2	216	0.82	88.52
131	Ward	2	218	0.82	89.34
132	Warren	1	219	0.41	89.75
133	Washington	1	220	0.41	90.16
134	Watson	2	222	0.82	90.98
135	Webb	5	227	2.05	93.03
136	Wells	0	227	0.00	93.03
137	West	0	227	0.00	93.03
138	White	4	231	1.64	94.67
139	Williams	0	231	0.00	94.67
140	Wilson	2	233	0.82	95.49
141	Wood	3	236	1.23	96.72
142	Woods	3	239	1.23	97.95
143	Wright	4	243	1.64	99.59
144	Young	1	244	0.41	100.00

Table C.4: Comments from Kansas Lenders

Comment Number	Scenario Number(s)	Comments
1	144	With the info given, we would deny the request unless there were reasonable explanations to the Credit Bureau and character references. In rural banking, the character carries a lot of weight.
2	97	A Fair Isaac credit bureau score of 700 and greater is good.
3	15, 19, 83, 7	All loans need more info on collateral. Are we the only lender? Can we get real estate? Ratios are cool but they do not secure the loans when times get bad. You have to have collateral not ratios.
4	15	You do not take on a new account with just a tractor loan. The credit score is too low to qualify for our equipment-financing program.
5	64	The numbers do not go with the credit score.
6	113, 138, 66, 105	Most of these answers would be different if they were current customers. Our collateral policy requires 30% down so a new customer would need a very strong financial statement for us to loan 80% of cost with no other relationship
7	133, 66, 75, 121	I would really like to know more about these customers before making a decision - look at Individual Tax Returns, know number of crop acres, livestock, etc.
8	66	Does he really need a $135,000 tractor?
9	55	We would look at the credit report to make sure the score was justified. If not, we would make loan. It is unlikely that someone with this financial statement would have a FICO that low.
10	60	Unless there is fraud in the financial statement, I would bet the FICO score is wrong. This statement is so strong I would risk the loan.
11	84, 42, 54, 123	In the four scenarios you offered, we might not get that loan because there may well be a better rate available in this area from other banks. That is o.k. with us as there is good consumer business available.
12	119	You would have to make a character judgment in order to approve the loan.
13	123	One does not achieve a 560 Emperica without working at it. That issue would have to be explored and addressed before the strength of the financial could be considered.

Table C.4: Comments from Kansas Lenders (Continued)

Comment Number	Scenario Number(s)	Comments
14	109	Where is the $25,000? It is not in cash.
15	87, 91, 96, 55	Actually, of all of these customers I would feel most comfortable with Farmer Hill if he is the most honest of the group.
16	55	With this customer, I might be interested in more collateral if he had to have a loan for $110,000. He is an honest customer. I would monitor his credit bureau score often to see the activity. If he is an honest person, I am more likely to find a way to get them a loan without putting our bank at a greater risk. (FSA Loan Guaranteed)
17	80	His payment would be over $20,000 per year, and his repayment capacity is less than that.
18	130	The ratios mean nothing if the borrower's character is lacking.
19	88	Why is the Fair Isaac credit bureau score low? Approval of the loan would depend on the reason(s) for a low credit score.
20	108, 57, 2, 129	Farmer Howard and Walker are not very good examples to include. If numerous responses want to make those loans, I would have some deals for them. Character is a big factor. However, just because neighbors may not like Farmer Robinson, more would have to be known on his work ethic.
21	128	Approval of the loan request could depend on why the FICO Score was 560.
22	113,81	It looks like the only difference between Farmer Mitchell and Farmer Sanders is the Fair Isaac credit bureau score. That would not make a difference to me.
23	102	The upper and lower quartile of productivity will not make a difference in terms of us making the loan, as cash flow appears fine in this scenario.
24	123	Character was a key factor for denying this loan.
25	100, 72, 29, 77	Additional information would be needed on Balance Sheet trends for analysis of earned net worth and other factors. We would also need to verify that the financial records are correct.
26	114	Need to see credit report!

Table C.4: Comments from Kansas Lenders (Comments)

Comment Number	Scenario Number(s)	Comments
27	60	Approval would be subject to verification of the Fair Isaac credit bureau score. The credit bureau score is not at all consistent with other factors provided in this scenario - honest reputation, good earnings, and low leverage. In addition, low productivity is not consistent with financials.
28	40	Our association requires at least a 25% margin on new equipment. However, due to the applicant's financial strength, we would make an exception to our policy.
29	10	Borderline loan - good credit score, wife has off farm income, numbers improving each year since 2002.
30	52	Approval depends on why his credit score is low: judgments, bankruptcy, past due accounts, large credit card debt.
31	13	The borrower has very little fall-back equity, weak working capital, and a history of losses.

Table C.5: Comments from Indiana Lenders

Comment Number	Scenario Number(s)	Comments
1	122, 121	A man farming 750 acres +/- cannot justify purchasing a $135,000 tractor.
2	68, 25, 138, 61	Observation: 700-acre farmer investing $190 per acre in a tractor! This is questionable.
3	15, 54, 45, 34	The loan would be scored in a typical situation due to the loan size.
4	52	The loan decision depends on reasons for credit rating. Since it is extremely low, this would indicate late payments. This loan request would be score carded in a typical situation, but probably not approved given the credit score.
5	83	The loan request would be classified as a medium (or average) risked credit.
6	13	The loan request would be considered a 4 (or special mentioned) rated credit.
7	128	This loan request would be an average rated credit on our system. The low credit score would be an issue. Whether it is right or wrong, it is our indication of how well he has paid others.
8	87	The loan decision would be subject to further debt restructuring against long term assets.
9	24	Grade 4 (1-highest and 8-lowest)
10	64	Why is his Fair Isaac credit bureau score so low? If it was explained and understood, the loan request might be approved instead of denied.
11	28	Grade 4 (earnings, equity, and liquidity)
12	4	This is a good borrower, with a lower rate.
13	39	He risk rates special mention/substandard.
14	12	He risk rates similar to a CD loan #2.
15	9	He risk rates substandard.
16	128	He risk rates very positive.
17	8, 56, 142, 67	I am not familiar with score carding.
18	59, 141, 88, 79	Please combine all of the STAR Financial bank requests into one to my attention. We received six different surveys in FW, CC, and Angola that were all forwarded to me.

Table C.5: Comments from Indiana Lenders (Continued)

Comment Number	Scenario Number(s)	Comments
19	102, 49, 6, 11	In the Bank Characteristics section of the survey, did you want information on our local portfolio or the entire company? In addition, I was unclear what you meant by score carded.
20	1, 16, 67, 86	Probably 3 of the 4 loan requests would be made at the point of sale by dealer financing and the bank would never see them.
21	16	This loan request would probably be turned down without performing an analysis.
22	67	We would give this one an opportunity to explain his credit report. If that made sense, maybe a smaller loan a used tractor.
23	86	We might talk to this one about a smaller loan on a used tractor.
24	120	Why won't his existing bank approve his loan request? (Unless his request is due to our bank's prospecting efforts.) The borrower's poor credit score is a big concern.
25	30	Does Farmer Dunn have any carry-over grain on hand, which is not yet realized as "earnings"? This loan would be approved, but it is likely to get much discussion during loan committee meeting. Most likely, we would request an FSA guarantee.
26	101, 120, 30, 130	We do not "score card" our loan decisions.
27	44	It is hard to understand how someone could have a Fair Isaac credit bureau score of 560 with little debt, good income, honest, and be an excellent financial record keeper.
28	44, 125, 142, 23	I do not understand what you mean by score carded.
29	135, 133, 81, 93	Our rates for machinery and equipment: 3 years or less = 5.50% Fixed; 4 years = 5.75% Fixed; 5 years = 5.75% Fixed.
30	64, 110	A Fair Isaac credit bureau score of 560 means lots of problems.
31	144	The decision on the loan could go either way. He would have to give a satisfactory explanation to this credit score.
32	68	Loan approval depends on the cause of the low Fair Isaac credit bureau score.

Table C.5: Comments from Indiana Lenders (Continued)

Comment Number	Scenario Number(s)	Comments
33	25, 27, 94, 60	The collateral requirements would be different in some of the loan selections and existing (or lack of) current loan relationship would also be a factor. I assume from the examples given this would be a new customer to the bank.
34	79	Loan approval is subject to more information on the parties & transactions giving rise to fairness concerns.
35	45, 121, 114, 105	It really does not matter what Griffin's, Stewart's, Scott's, or Richardson's character is because none of the four can cover their current debt service let alone take on more debt. They would probably all like to pay their bills on time and improve their credit scores, but they cannot. They are all highly leveraged, including Scott. Scott needs to sell out before all his equity is gone.
36	45, 121, 114, 105	Our underwriting is done in Columbus, OH, but I would not have wasted their time on any of these deals. I would have turned them down and not sent anything to our underwriters. They would have laughed and thought I was crazy if I sent them these deals.