Do Farm Credit Customers Prefer Lower Interest Rates or Higher Patronage Payments?

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ABSTRACT:

Do Farm Credit Customers Prefer Lower Interest Rates or Higher Patronage Payments?

Farm Credit Services of East Central Oklahoma (FCSECO) is part of a nationwide cooperative that supplies financing for full-time and part-time farmers. FCSECO not only makes loans to farmers but because it is a cooperative, its members/borrowers also benefit from what is known as the patronage payment. The patronage payment is a way of distributing Farm Credit’s profits to its members/borrowers. Since FCSECO is customer-focused and customer-driven, it is essential that the FCSECO Board of Directors knows their customer base and what they desire as a customer. It would benefit FCSECO to determine the substitutability between patronage payments and fixed interest rates.

A conjoint survey was conducted on random FCSECO customers. After performing an OLS regression analysis, the results illustrated that the average FCSECO customer values a higher patronage payment more than a lower fixed interest rate on a given loan. This information is valuable to the FCSECO Board of Directors because it shows which attribute the average FCSECO customer has a preference towards. Since the average FCSECO customer greatly values the patronage payment, the FCSECO Board of Directors could use the patronage payment to its advantage in securing new loans.
INTRODUCTION:

Do Farm Credit Services (FCS) customers prefer lower interest rates or higher patronage payments? To answer this question, this study uses conjoint analysis to determine the trade-off between these two attributes. This study benefits FCS in that it will help FCS better understand their customer base and their customer’s preference towards patronage payments and fixed interest rates. Since this study focuses on FCS customers, it would be beneficial to know who FCS is and why they exist.

FCS, chartered in 1917, is a nation-wide cooperative that supplies financing for full-time and part-time farmers. FCS of East Central Oklahoma (FCSECO) consists of 51 counties in Oklahoma and serves more than 5,000 members. The purpose of FCS is to finance agricultural and rural living needs by providing competitive rates on livestock, operating, equipment, real estate and country home loans. FCS not only makes loans to farmers but because it is a cooperative, its members/borrowers also benefit from what is known as the patronage payment. This study focuses only on the FCSECO association and its customers and not the entire FCS system.

The patronage payment is a way of distributing FCS’s profits to its members/borrowers. When customers receive a patronage payment, their effective cost of borrowing is reduced. Each year, the FCS Board of Directors allocates funds to each FCS branch in the state. The amount of the funds are determined and calculated by FCS each year. The FCS Board of Directors determines the patronage payment amount based upon a percentage point system. For example, on a $150,000 real estate loan, a one hundred basis point or one percent payout would equal a patronage payment of $1,500, a one half
percent payout on $150,000 would equal a patronage payment of $750 and a zero percent payout on $150,000 would equal a patronage payment of $0.

Currently, FCSECO customers receive their patronage payment check in the mail or through an open house at their local FCS branch. The patronage payment has been given for the last eight years; however, it is not guaranteed every year. Declaring a patronage payment depends upon the profits made by FCS each year, therefore, it cannot be guaranteed. The patronage payment may differ in dollar amounts each year due to the percentage point basis decided upon by the Board of Directors. In other words, even though a FCS customer has the same dollar amount in total loans borrowed each year, the customer may receive a different patronage payment amount each year. It is important that FCS customers understand the patronage payment and how it is calculated so the customer can understand why they may receive different amounts of patronage payments each year.

Since FCSECO is customer-focused and customer-driven, it is essential that FCSECO knows their customer base and what they desire as a customer. It would benefit FCSECO to determine their customer’s preference concerning the substitutability between the patronage payment and fixed interest rates, or if they even have a preference between the two attributes. The substitutability, or trade-off point, between lower fixed interest rates at the cost of reducing patronage payments is what the FCSECO Board of Directors will find beneficial. The FCSECO Board of Directors will be able to use this information to determine if the average FCSECO customer has a preference between these two attributes, and if so, what the average customer prefers. This is important to the Board of Directors because FCSECO is a cooperative and they need to know what their
customers desire to keep the average customer happy and to keep their business. By determining which attribute the average FCSECO customer has a preference for; the FCSECO Board of Directors could adjust the fixed interest rate and/or the patronage payment to make FCSECO more profitable or benefit their members/borrowers.

The FCSECO Board of Directors could also save FCSECO money if they know the trade-off between the two attributes. By determining what the average FCSECO customer prefers and determining the trade-off point between the two attributes, the FCSECO Board of Directors can better evaluate their decisions on setting the patronage payment. The FCSECO Board of Directors will also find this information valuable in that if the average FCSECO customer has a preference towards the patronage payment, the Board of Directors can use the patronage payment as a marketing tool for promotion to potential customers. Thus, the objective of this study is to determine the average FCSECO customer’s preference between fixed interest rates and patronage payments.

**METHODOLOGY:**

Within the survey that was used to determine the substitutability between fixed interest rates and patronage payments, FCSECO customers were able to rate their desirability concerning these two attributes. The customers were asked to pretend they had a $150,000 piece of real estate and wanted to finance this purchase on a twenty-year note with FCSECO. They were asked to rank from one to seven their desirability of each option given, with the number one being a very undesirable choice and the number seven being a very desirable choice. There were three choices of fixed interest rates; 8%, 8.5% and 9%. These fixed interest rates represent actual fixed interest rates charged by FCSECO today. There were also three choices of expected annual cash patronage
payment amounts; $0, $750 and $1,500. These patronage payment dollar amounts were calculated by taking 0 percent, ½ percent, and 1 percent, respectively, from the $150,000 real estate note. The percentage point basis payout given by FCSECO is on average around the ½ percent level. However, to give customers the chance to rank their desirability concerning the patronage, a zero percent and one percent basis payout were implemented into the survey. The three options given for each the fixed interest rate and the patronage payment amount yielded a total of nine different options the customers could rate.

There are many established scientific methods to test the substitutability of attributes and one method is conjoint analysis. Conjoint analysis was utilized in this study because it is an excellent tool to use to determine substitutability between attributes of a good (the good in this case is the loan). Conjoint analysis refers to a technique where consumer’s rate, rank, or choose between products that are described by several attributes (Norwood & Lusk pg. 35). In conjoint analysis, the researcher has the ability to only alter one variable at a time in choice sets, thereby isolating the effect of that variable on individual utility (Hudson pg. 209). Table 1.1 shows the actual question presented to FCSECO customers in the survey.

Table 1.1: Desirability Question from FCSECO Customers Survey

You have just purchased a $150,000 piece of real estate and want to finance this purchase on a 20-year note. The following table asks you to rate how desirable each loan option is relative to the real estate interest rate and the expected annual cash patronage payment. Each loan option only varies on these two attributes presented to you. Please circle the number that best represents how desirable each loan option is to you.

Circle the number of how desirable each loan option is:
Regression analysis was then used to determine the relative importance of the two attributes (Lusk & Norwood pg 35) or, fixed interest rates and patronage payments. The regression analysis results will show the substitutability between the two attributes based on the preference of an average FCSECO customer. Furthermore, the results will show if the average FCSECO customer prefers a higher patronage payment or a lower fixed interest rate on real estate loans.

\[ Y_{i,m} = \alpha + \beta_1(INT)_{i,m} + \beta_2(PAT)_{i,m} + e \quad \forall i = 1,2,\ldots,174; \quad m = 1,2,\ldots,9 \]

The equation above is the regression model used to determine the substitutability between fixed interest rates and patronage payments. The \( Y \) represents the predicted utility of the average FCSECO customer. The \( INT \) stands for the fixed interest rate variable and the \( PAT \) stands for the patronage payment variable. The letter \( i \) represents the number of surveys used and the letter \( m \) represents the number of questions the customer was asked to rank their desirability.
Finding the predicted utility of the average FCSECO customer and comparing it to other predicted utilities using different variables of fixed interest rates and patronage payments will show which attribute is more desirable. Using the data from the desirability question will allow the FCSECO Board of Directors to see which attribute the average FCSECO customer desires more.

**DATA:**

A survey questionnaire was designed and administered. The survey was then mailed to 963 random FCSECO customers. Of the 963 surveys, 174 were returned and were useable. Thus, the survey yielded a response rate of 18.07%. Descriptive statistics showed that these 174 returned surveys were comparable to the average FCSECO customer. This was important to establish because the data would generate a true representation of the typical FCSECO customer and their views on the patronage payment.

Table 1.2 below illustrates a few of the descriptive statistics derived from the survey. The variables listed were actual questions on the survey and the results of the questions are listed to the right of the variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>25th Percentile</th>
<th>50th Percentile</th>
<th>75th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Farm Sales</td>
<td>$175,666.06</td>
<td>$6,000.00</td>
<td>$26,517.17</td>
<td>$80,000.00</td>
</tr>
<tr>
<td>Loans with Farm Credit</td>
<td>1.67</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Non-farm Income</td>
<td>$123,444.48</td>
<td>$40,000.00</td>
<td>$70,000.00</td>
<td>$100,000.00</td>
</tr>
<tr>
<td>Operator's Age</td>
<td>54.08</td>
<td>46.00</td>
<td>53.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Percent of Operators who worked off-farm in 2006</td>
<td>68.97%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Spouses who worked off-farm in 2006</td>
<td>76.30%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The numbers found above in the table were compared to actual numbers given by FCSECO to determine that these descriptive statistics were a true representation of the average FCSECO customer. The data collected from FCSECO was based on the time of the customer’s application and there were a total of 3,907 loans that the FCSECO data encompassed. The gross farm sales derived from the survey was $175,666.06 and the number from FCSECO data was $200,002.00. The number of loans per customer was 1.44 from FCSECO compared to 1.67 from the survey. Non-farm income was $123,444.48 per the survey and the number from FCSECO data was $125,699.00. The operator’s age was 54.08 from the survey compared to 59.39 from FCSECO data.

Relating back to utility theory, the average person has a higher utility when receiving money and the average person has a lower utility when paying out money. So concerning the two attributes being tested, one would hypothesize that the patronage payment would positively impact a FCSECO customer’s utility and that the fixed interest rates would negatively impact a FCSECO customer’s utility. The reasoning behind this is that when receiving money, in this case the patronage payment, the average customers utility will be higher than when paying out money, like paying a fixed interest rate on a real estate loan.

**REGRESSION RESULTS:**

Since the survey results were intended for the FCSECO Board of Directors, the patronage payment data was transformed back to a percentage point basis while running the regression analysis. However, because the average FCSECO customer is only familiar with dollar amounts concerning the patronage payment and not a percentage point basis, the survey the customers were presented displayed the patronage payment in
dollar amounts and not by a percentage point basis. It was important to transform these numbers so both the FCSECO Board of Directors and the FCSECO customers could each understand the survey’s patronage payments and how they were calculated. Table 1.3 presents the regression results.

Table 1.3: Regression Results from Survey

<table>
<thead>
<tr>
<th>Variables</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>18.92</td>
<td>0.80</td>
<td>5.51E-106</td>
</tr>
<tr>
<td>INT</td>
<td>-1.94</td>
<td>0.09</td>
<td>4.42E-154</td>
</tr>
<tr>
<td>PAT</td>
<td>2.78</td>
<td>0.09</td>
<td>2.61E-84</td>
</tr>
</tbody>
</table>

The regression results are as follows; the intercept is 18.92, the INT is a negative 1.94 and the PAT is a positive 2.78. Since the fixed interest rate variable is a negative number; it will decrease the average FCSECO customer’s utility function. Looking back at the survey question in Table 1.1, the parameter estimates for the two attributes being tested are related to the ranking scale from one to seven. This means that for every one percent increase in the patronage payment the customers predicted utility or ranking increases by 2.78. Likewise, for every one percent increase in fixed interest rates the customers predicted utility decreases by 1.94.

The above data supports the utility theory. The patronage payment variable is a positive number and the fixed interest rate variable is a negative number. When the average FCSECO customer is paying out a fixed interest rate, their predicted utility decreases and when the average FCSECO customer receives a patronage payment, their predicted utility function increases.
Now that the regression analysis data has been determined, the trade-off between the two attributes can be discovered. Plugging in different variables from the surveys examples of patronage payments and interest rates will yield the preference of an average FCSECO customer. For example, if FCSECO decreases the patronage payment by one percent and decreases the fixed interest rate by one percent, the results will show which attribute the average FCSECO customer has a preference towards. In other words, which attribute they value more as a customer. Of note is that a one percent negative change in both attributes at the same time is a net zero percent financial change to the customer. This is because the interest rates and the patronage payments are directly related to each other. Since this change is a net zero percent financial change, the average FCSECO customer should not value one attribute over the other. However, we realize that bringing in preference to determine utility will alter the customers’ decision.

Continuing with the survey’s $150,000 loan example, if FCSECO were to decrease both the interest rate and the patronage payment by one percent, the data will show which attribute the average customer has a preference towards. According to the survey results, if the average FCSECO customer was currently receiving a 1.0% patronage basis payout, which is $1,500, and a 9.0% fixed interest rate on a real estate note the customer’s utility would be 4.22. The 4.22 relates back to the survey question that uses the scale from one to seven to rank the customers preference. The number 4.22 would be above average utility according to the scale. When decreasing both attributes by one percent, causing the 1.0% basis payout of $1,500 to decrease to a 0% basis payout, an amount of $0 and causing the fixed interest rate to decrease from 9.0% to 8.0%, the average FCSECO customers utility decreases to 3.38. Since the customer’s utility
decreases from 4.22 to 3.38 when decreasing both attributes by one percent, this shows that the average FCSECO customer has a preference towards one of the attributes. Keep in mind that this change is a net zero percent financial change to the customer; in other words, the average customer should not care. But because of preference, the average customer’s utility reflects a change in desirability.

When changing only one attribute and holding utility constant, it is possible to find which attribute the customer has a greater preference towards. Using a patronage basis payout of 1.0% and a fixed interest rate of 9.0%, the expected customer’s utility equals 4.22. By decreasing the patronage basis payout by one percent and holding utility constant at 4.22, the fixed interest rate would have to decrease by 1.4% to keep utility the same. The average FCSECO customer desires the patronage payment more than the fixed interest rate on a current loan. This means that FCSECO customers greatly value the patronage and it is important that the FCSECO Board of Directors understands this. The reason the Board of Directors needs to understand this is because it could save FCSECO money. The example listed above and using the $150,000 loan that was in the survey can be used to demonstrate how FCSECO can save money. Decreasing the patronage payment by 1.0% yields a positive $1,500 savings for Farm Credit. This is derived by decreasing the patronage by 1.0%, which is $1,500 minus zero dollars which equals $1,500. This is a savings for FCSECO because they are not paying out the patronage to customers. However, while decreasing the fixed interest rate by 1.4%, to keep the average customer at the same utility, $2,100 of revenues are lost. This is derived from taking 1.4% multiplied by the $150,000 loan, which is $2,100. After subtracting the negative $2,100 revenues from the $1,500 savings, FCSECO is faced with a negative
$600 impact. Not only does the average FCSECO customer find utility in receiving the patronage payment, but the Board of Directors can also save FCSECO money by using this information concerning the patronage payment. From the example above, it is important to note that FCSECO can save money by lowering the patronage payment, but can lose money by lowering fixed interest rates. Because the average FCS customer desires the patronage payment more than the fixed interest rate, FCSECO would keep their customers at a higher utility by paying out the patronage payment each year. So not only does the average FCSECO customer desire the patronage payment, but FCSECO would also save money by adjusting the patronage payment rather than fixed interest rates. By understanding the trade-off between the two attributes and looking at the data from the Board of Directors view, it is easy to see how this information can help FCSECO save money.

Looking at another example where if FCSECO were to increase fixed interest rates by 1%, FCSECO would only have to increase the patronage payment by 0.7% to keep the average FCSECO customer at the same utility. This example goes to show even further that the average FCSECO customer values the patronage payment more than fixed interest rates. If FCSECO increases fixed interest rates by one percent, which it would be very rare for FCSECO to increase fixed interest rates, FCSECO would only have to increase the patronage by 0.7% to keep the average customer at the same utility as before the increase in fixed interest rates.

**CONCLUSION:**

Using conjoint analysis, this paper is able to prove that the average FCSECO customer does value a higher patronage payment more than a reduction in fixed interest
rates. The previously discussed example shows that while FCSECO can decrease the patronage payment by 1.0%, FCSECO will have to decrease the fixed interest rate by 1.4% for the customer to have the same utility. The average FCSECO customer has a preference towards the patronage payment and it is reflected throughout this survey data.

The reason these survey results are important is because it will immensely help the FCSECO Board of Directors understand their customer base better and what their customers desire in a lending institution. Since FCSECO is a cooperative, this information is critical for the FCSECO Board of Directors to know because their profits depend upon their customers and in order to make profits, they need to know what their customers desire in a lending institution. It is important for any institution to know what their customer’s preference is. FCSECO is no different and should use these survey results to their advantage to understand their customer’s desirability towards two attributes that FCSECO offers.

Going back to the example of the negative $600 impact on FCSECO shows how important this information can be to the lending institution. By knowing which attribute the average FCSECO customer desires and by knowing to what extent the average customer desires that attribute, FCSECO can use this information to their benefit and save money. The data shows that FCSECO can make money by lowering patronage payments and can lose money by lowering fixed interest rates. After seeing the regression results and the trade-off between the two attributes, it is easily seen that the average FCSECO customer values the patronage payment. FCSECO can use this information to better evaluate their decisions on setting the patronage payment and fixed interest rates, overall saving FCSECO money and increasing their profits. It is also a benefit to
FCSECO that the average FCSECO customer values the patronage payment because FCSECO can alter the patronage payment to increase profits as well as, increase customer utility.

Since the average FCSECO customer values the patronage payment so much it could also be used as a marketing tool to attract outside customers to FCSECO. The data shows how important it is that the average FCSECO customer receives their patronage payment each year. Due to this importance to current FCSECO customers, the Board of Directors can use the patronage payment as a promotion towards potential customers.

Through this study, it is acknowledged that the average FCSECO customer prefers higher patronage payments compared to lower fixed interest rates. Customers preference, saving FCSECO money and using the patronage payment as a marketing tool towards outside customers are the three main reasons the FCSECO Board of Directors will find this information and data useful and helpful.
REFERENCES:


ACKNOWLEDGEMENTS PAGE:

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