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Emerald Article: Farm credit member-borrowers' preferences for patronage payments

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Farm credit member-borrowers' preferences for patronage payments

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Abstract

Purpose – Many associations in the Farm Credit System, which are financial cooperatives, pay their member-borrowers a cash patronage payment based on the amount of loan volume with the association. In today's competitive lending environment, some Farm Credit associations have offered lower interest rates on new loans but these new member-borrowers have to forgo their cash patronage payment to receive this new, lower-interest rate loan. The purpose of this paper is to identify Farm Credit member-borrowers' preferences for patronage refunds received as a cash payment versus lower fixed real estate interest rates.

Design/methodology/approach – Preferences for patronage refunds or lower fixed interest rates are elicited from Farm Credit Services of East Central Oklahoma member-borrowers via conjoint analysis.

Findings – Results show that member-borrowers strongly prefer patronage refunds compared to lower fixed interest rates.

Originality/value – This paper fulfills a need to better understand patronage refund programs within the Farm Credit System.

Keywords United States of America, Credit, Farms, Financial management, Customer surveys, Customer satisfaction

Paper type Research paper

Cooperatives are unique businesses because their customers are also owners, or a customer is both a patron and an investor. Because of this unique relationship, many cooperatives provide benefits to their customers. For example, electric cooperatives tout cost savings for joining their respective cooperatives and others, like Sunkist Growers, band their members together to negotiate and receive higher prices for the commodities they produce. A well known financial cooperative, the Farm Credit System (FCS), provides benefits to their member-borrowers through competitive loan interest rates and patronage payments. A common type of patronage payment in the FCS is to return some of the interest paid by their qualifying member-borrowers back to those member-borrowers. Some associations in the FCS even offer member-borrowers a tradeoff between patronage payments or lower interest rates on real estate loans. This creates an interesting situation where the member-borrower must compute the present value of receiving patronage

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payments versus the cost savings of lower interest rates. Such a situation is discussed in this paper.

Much of the literature on patronage payments/dividends have focused on the impact of paying out patronage payments to cooperative members. Beierlein and Schrader (1978) simulated the impact of growing patronage rates across different financing policies of cooperatives. Sykuta and Cook (2001) discussed different contractual designs of cooperatives and their impact on traditional patronage payments. Fulton and Giannakas (2001) and Fulton (1999) discuss member commitment or preferences for doing business with a cooperative and the cooperative's ability to impact these preferences through different contractual arrangements. The present paper contributes to the patronage literature by eliciting member-borrowers' preferences for cash patronage payments in the FCS.

The FCS is a government sponsored enterprise (GSE) that provides financial services to agricultural and rural borrowers in the United States. The FCS provides short-, intermediate-, and long-term credit to meet the production, marketing, and home ownership needs of farmers, ranchers, and harvesters of aquatic products in rural areas. In many respects, the FCS is similar to a bank except for their GSE status, which provides tax exemptions for the FCS. One way a FCS association competes with banks is by offering lowering interest rates on long-term real estate loans to its member-borrowers. Also, FCS association member-borrowers are eligible to receive a patronage dividend based on their contributions to the net interest income of the association or the total amount of their term loan volume.

Many associations within the FCS pay a patronage or distribute some other type of dividend to their member-borrowers. The Farm Credit Administration, which is the Federal regulatory and examining agency of the FCS, encourages FCS associations to be cognizant of their capital position when deciding if and how much patronage to pay to member-borrowers. Even though paying a patronage reduces a FCS association's capital level, the Farm Credit Administration recognizes the need to adhere to fundamental cooperative principles (FCA, 2006). In 2006, 85 percent of FCS associations paid a patronage, which increased from the 20 percent that paid 10 years ago (FCA, 2006). A total of $874 million was declared in patronage by all FCS associations in 2005, but this number decreased to $718 million in 2006 because many FCS associations experienced a great deal of loan volume growth and needed to retain some earnings to maintain strong capital levels (FCA, 2006).

In the present study, the focus is on Farm Credit Services of East Central Oklahoma, hereafter referred to as East Central Farm Credit. The territory for East Central Farm Credit covers the central corridor of counties in Oklahoma and then extends to the eastern border. A total of ten branch offices service this area, and their total loan volume in 2006 was $372 million. This amount of loan volume is considered to represent a medium-sized association compared to other associations across the country. In 2006, Farm Credit Services of America had $10.5 billion in loans, and a small Farm Credit in Oklahoma, Farm Credit of Central Oklahoma, had $74 million in loans.

East Central Farm Credit distributes their patronage by returning some of the cash interest paid by their member-borrowers back to them (i.e. a qualified cash patronage distribution that the member-borrower must pay taxes on)[1]. East Central Farm Credit has a fairly long history of making patronage payments and these payments have generally increased over time (1998: $930,000; 1999: $1.1 million; 2000: $1.65 million; 2001: $1.8 million; 2002: $1.25 million; 2003: $1.1 million; 2004: $1.1 million; 2005: $2.25 million; 2006: $3.1 million). Since East Central Farm Credit started paying a patronage,

they have made a considerable marketing effort to promote their patronage program through various media sources.

Even though a member-borrower may be eligible to receive a patronage payment, the board of directors must declare a patronage each year based on the association's financial position and the overall outlook for its respective lending market. What is unique about the FCS is that the board of directors could implicitly incorporate their patronage refund into their interest rates by simply lowering their interest rates and not pay a patronage. This may be a good strategy given that Farley and Ellinger (2007) found that Farm Credit System borrowers are highly sensitive to interest rates. Some FCS associations, such as East Central Farm Credit, will go so far as to have their members sign a patronage waiver in order to receive a lower interest rate on a real estate loan. Is this a good marketing strategy for these FCS associations? Do member-borrowers prefer lower real estate interest rates compared to patronage refunds?

The objective of this paper is to identify Farm Credit member-borrowers' preferences for patronage refunds received as a cash payment versus lower fixed real estate interest rates. These preferences are elicited from member-borrowers with East Central Farm Credit through conjoint analysis. Results show that member-borrowers strongly prefer cash patronage payments compared to lower, fixed real estate interest rates. These results imply that the patronage refund program may be a way to attract new customers and forgoing these patronage refunds for lower interest rates may not be the best marketing strategy for East Central Farm Credit. Finally, these results provide discussion points for other FCS associations considering implementing a patronage program and for those associations that currently have a patronage program.

Eliciting member-borrower patronage preferences through conjoint analysis

Member-borrower preferences for patronage payments could be determined by analyzing actual loans that differ on amount of patronage paid as well as interest rates. Even if East Central Farm Credit granted permission to analyze the details of these loans, identifying the member-borrower's preferences for higher patronage payments or loan interest rates would be difficult. The reason is many other factors would have influenced the member-borrower's decision to accept the loan (for example, required collateral, payment structure, loan officer, etc.). To circumvent this problem and to isolate the outcomes of interest, a controlled experiment is designed to elicit member-borrowers' preferences for patronage payments versus interest rates.

One can conceptualize the *i*th member-borrower deriving utility from the *j*th loan with stated patronage payment and interest rate. Based on these loan attributes, an indirect utility function is employed; $U_{ij} = V_{ij} + {}_{ij}$, where U is the utility derived from the differing loan attributes, V is the systematic portion of the utility function and ε is the stochastic error component. This conceptual model motivates an interesting question – at what point are member-borrowers indifferent between lower interest rates or higher patronage payments? In other words, at what point are member-borrowers willing to substitute patronage payments for lower interest rates. A well-known survey technique is employed to identify the substitutability of these two important loan attributes – conjoint analysis.

Many established scientific methods are available to test the substitutability of attributes and one method is conjoint analysis. Conjoint analysis is used in this study because it is easily understood by survey respondents and is a straightforward way to determine the substitutability between attributes of a good (the good in this case is a real estate loan). Conjoint analysis refers to a technique where consumers' rate, rank or

choose between products that are described by several attributes (Norwood and Lusk, 2008). In conjoint analysis, the researcher has the ability to alter variable(s) in choice sets, thereby isolating the effect of that variable on individual utility (Hudson, 2007). Therefore, conjoint analysis provides the mechanism to isolate East Central Farm Credit member-borrowers' preferences for lower fixed real estate interest rates or higher expected annual cash patronage payments. Expected annual cash patronage payment is used because the East Central Farm Credit board of directors has not declared a patronage for the year and it is therefore not known with certainty[2].

In this study, East Central Farm Credit member-borrowers were told to imagine that they had just purchased a $150,000 piece of real estate, and they were going to finance this purchase with a 20-year loan with annual payments. Next, they were presented nine loan options and were asked to rate these loan options on a scale from one to seven with one being very undesirable and seven being very desirable. The question stressed that these loan options only differed by the fixed real estate interest rate and the expected annual cash patronage presented to them as shown in Table I.

Given that the survey was administered in January of 2007, discussions with senior management of East Central Farm Credit ensured that the interest rates and patronage payments used matched current market conditions. Fixed real estate interest rates used are 8 percent, 8.5 percent and 9 percent. Real estate loan borrowers with East Central Farm Credit receive cash patronage payments based on their total outstanding real estate loan amount and the cash patronage refund percentage set by the board of directors. The annual cash patronage payment for each member-borrower is calculated by taking the amount of the real estate loan volume for the member-borrower multiplied by the cash patronage refund percentage. East Central Farm Credit's board of directors has historically never set cash patronage refund percentages above 1 percent and could declare no patronage. Thus, three cash patronage refund percentages are used in this study: 0 percent, 0.5 percent and 1 percent. Since our survey sample or the member-borrowers receive this patronage payment in the form of cash, these percentages are converted and presented as the expected annual cash patronage payments of $0, $750 and $1,500 based on the $150,000 real estate loan. Three fixed real estate interest rates and three expected annual cash patronage payments yield nine possible loan option combinations, which is the complete factorial design shown in Table I.

Regression type analysis is used to identify the point of indifference or the marginal rate of substitution between fixed real estate interest rates and expected annual cash

Loan option	Fixed interest rate (%)	Expected annual cash patronage payment ($)	Circle the number of how desirable each loan option is: 1 = very undesirable						very desirable = 7
1	9	750	1	2	3	4	5	6	7
2	8.5	1,500	1	2	3	4	5	6	7
3	9	0	1	2	3	4	5	6	7
4	8	750	1	2	3	4	5	6	7
5	8.5	0	1	2	3	4	5	6	7
6	9	1,500	1	2	3	4	5	6	7
7	8	1,500	1	2	3	4	5	6	7
8	8.5	750	1	2	3	4	5	6	7
9	8	0	1	2	3	4	5	6	7

Table I. Conjoint rating question of a $150,000 real estate loan over varying fixed interest rates and expected annual cash patronage payments

patronage payments of member-borrowers. Since member-borrowers rate the desirability of each loan option on an ordinal one to seven scale, the dependent variable is assumed to index latent utility (see Greene, 2002). Thus, an ordered probit model is the appropriate regression model for this analysis. Formally, the ordered probit model to be estimated is:

$$V_{ij} = \beta_0 + \beta_1 Pat_{ij} + \beta_2 Int_{ij} + \varepsilon_{ij}, \quad (1)$$

where V_{ij} is the utility or rating of loan option j for member-borrower i and β represents the coefficients to be estimated. In order to calculate the marginal rate of substitution between expected annual cash patronage payments and fixed interest rates, Pat represents the cash patronage refund percentage, not the dollar amount shown in Table I, and Int is the fixed real estate interest rates shown in Table I. This makes the units of Pat and Int equivalent. Following Boyle *et al.* (2001), the parameter estimates obtained from the ordered probit model are used to calculate the marginal rate of substitution between expected annual cash patronage payments and fixed real estate interest rates. These marginal rates of substitutions are calculated by taking the parameter estimate for expected annual cash patronage payments and dividing it by the negative of the parameter estimate for fixed real estate interest rates (i.e. $\beta_1/-\beta_2$).

Data

A random sample of 963 East Central Farm Credit member-borrowers was selected and these member-borrowers were mailed a survey questionnaire containing the conjoint question and other socioeconomic and demographic questions. Of the 963 mailed surveys, a total of 174 surveys were returned that were useable, which yields a response rate of 18 percent. Outliers were identified and deleted if the observations were $+/-2$ standard deviations from the mean of gross farm sales and non-farm income, which left 172 observations for the analysis.

Table II reports the descriptive statistics for the member-borrowers within our sample. To see how representative this sample is of farmers in east central Oklahoma, descriptive statistics are compared with means taken from the United States Department of Agriculture/Economic Research Service (USDA/ERS, 2008) website that allows access

Variable	Mean	25th percentile	50th percentile	75th percentile
Gross farm sales	\$68,344	\$0	\$19,000	\$66,375
Acres (owned, leased and/or rented)	665	135	320	730
Non-farm income (salaries, wages, pensions, interest, etc.)	\$74,924	\$26,068	\$60,000	\$90,000
Operator's age	53	46	53	60
Household size	2.73	2	2	3.5
Did you work off of the farm? (yes = 1, 0 otherwise)	0.68			
Do you have a college degree? (yes = 1, 0 otherwise)	0.53			
When shopping for a lender, how important is it to you for the lender to share its earnings with its customers through either a patronage or dividend?				
Scale: 1 = not important to 7 = very important	5.25	4	6	7

Note: Sample size is 172

Table II.
Descriptive statistics of surveyed Farm Credit Services of East Central Oklahoma member-borrowers

to the 2006 *Agricultural Resource Management Survey* (*ARMS*). The Eastern Uplands farm resource region is used to compare with the survey because it includes and best represents the market area for East Central Farm Credit. Average gross farm sales are $68,344, which is higher than the average taken from *ARMS* ($29,263). Both surveys indicate most farm households in East Central Farm Credit's market area are small. Further support for most farms being small in the market area is found by the average total number of acres being less than 665 in both surveys. Most of the member-borrowers in the survey sample and nearly a majority of *ARMS* representative sample stated they worked off of the farm in 2006, 0.68 and 0.48, respectively. Average non-farm income (income from all non-farm sources) for this sample of member-borrowers with East Central Farm Credit is $74,924 and the mean non-farm income from *ARMS* is $57,940.

Before the survey respondents answered the conjoint question, they were asked to imagine they were shopping for a lender, and, to state how important it is to them that a lender shares some of its earnings in the form of a patronage or dividend. Responses were on a scale from one to seven with one being not important and seven being very important. On average, survey respondents feel it is important that a lender share some of its earnings since the average response, 5.25, is greater than four or the midpoint. This response provides evidence that a patronage payment is valued by member-borrowers of East Central Farm Credit, but how much this payment is valued over lower interest rates requires additional work. Analysis of the conjoint question will provide this value.

Conjoint rating results

Ordered probit estimates of the conjoint ratings are reported in Table III[3]. Remember that expected annual cash patronage payments, hereafter referred to as expected patronage payments, are transformed back to their percentage form for ease in interpretation. All estimates are statistically significant at the 1 percent level and meet a priori expectations. That is, higher expected patronage payments and lower fixed real estate interest rates, hereafter referred to as interest rates, increase the utility of member-borrowers.

Variable	Model 1 estimates	Model 2 estimates
Constant	11.88* (0.58)	11.96* (0.58)
Expected annual cash patronage refund percentage	194.60* (7.04)	223.04* (12.49)
Fixed real estate interest rate	−137.96* (6.90)	−141.93* (6.97)
Expected annual cash patronage refund percentage * operator worked off the farm	–	−39.83* (14.87)
Fixed real estate interest rate * operator worked off the farm	–	4.46* (1.14)
Threshold parameters		
$\mu 1$	0.45* (0.03)	0.46* (0.03)
$\mu 2$	0.90* (0.03)	0.90* (0.03)
$\mu 3$	1.49* (0.04)	1.50* (0.04)
$\mu 4$	2.07* (0.04)	2.09* (0.04)
$\mu 5$	2.71* (0.05)	2.72* (0.05)
McFadden pseudo *R*-squared	0.16	0.16

Notes: Sample size is 172; dependent variable is a 1 to 7 Likert rating scale where 1 is very undesirable and 7 is very desirable for each loan option; * indicates statistical significance at the 1 percent level; standard errors are in parentheses.

Table III. Ordered probit results of the conjoint rating of loan options by Farm Credit Services of East Central Oklahoma member-borrowers

Model 1 clearly shows that member-borrowers prefer higher expected patronage payments compared to lower interest rates[4]. The marginal rate of substitution between expected patronage payments and interest rates helps to illustrate this point. If expected patronage payments were to increase by 1 percent, interest rates would have to increase by 1.41 percent to hold utility constant. In other words, an average member-borrower is okay with increasing interest rates as long as the expected patronage payment increases as well. To illustrate this tradeoff, consider this simple example.

Assume a member-borrower is asked to make the choice between a low interest rate loan with no patronage payment, say loan option 9 in Table I that has an 8 percent interest rate but pays \$0 in patronage, and a high interest rate loan that does pay a patronage, say this high interest rate loan pays the highest patronage given in Table I or \$1,500. What interest rate on the high interest rate loan would make the member-borrower indifferent between the two loan options? To calculate this indifference interest rate, one must simply set the present value of annuity formulas for the two loan options equal to each other and solve for the indifference interest rate (r) as shown here,

$$\frac{-\$150,000 \cdot 0.08}{1 - 1.08^{-20}} = \frac{-\$150,000 \cdot r}{1 - (1+r)^{-20}} + \$1,500$$

In this example, the indifference interest rate equals 9.294 percent. Interestingly, our estimated marginal rate of substitution states the indifference interest rate that holds utility constant equals 9.41 percent. Setting r equal to 9.41 percent in the formula above makes the annual payment \$137 higher than if r was equal to 9.294 percent. So, why are the East Central Farm Credit member-borrowers we surveyed willing to pay more for a higher patronage payment?

Patronage payments, in this context, are essentially an interest rebate. Conventional theory of rebates states that sellers are able to price discriminate between high- and low-reservation price consumers via rebates (Chen *et al.*, 2005; Moraga-Gonzalez and Petrakis, 1999; Blattberg and Neslin, 1990). Farm Credit, however, cannot price discriminate since they effectively offer one product (a loan) so this is not the best explanation for why our sample strongly prefers patronage payments.

Given this strong preference and East Central Farm Credit's history of making patronage payments, member-borrowers potentially incorporate these expected patronage payments into their endowment. If so, then the member-borrowers may be exhibiting loss aversion as discussed in prospect theory (Kahneman and Tversky, 2000; Tversky and Kahneman, 1992). Member-borrowers strongly prefer to avoid the \$0 expected annual cash patronage payment, which they view as a loss since they have received a cash patronage payment since 1998. Unfortunately, loss aversion cannot be tested since the framing effects around the reference points or dollar amounts of losses were not incorporated in the conjoint question.

However, the presented hypothetical loan options did provide the member-borrowers an external reference price of a "regular" priced loan (i.e. a loan without a patronage payment). Consumer research has shown that the presence of an external reference price and a "sale" price (i.e. a loan with an expected patronage payment) enhances the attractiveness of an offer (Lichtenstein *et al.*, 1991, Urbany *et al.*, 1988) and may increase sales (Rajendran and Tellis, 1994). Member-borrowers may be extracting value from rating "sale" priced loans (with a patronage) higher than the "regular" priced loans (without a patronage). This argument is similar to that of Thaler

(1985) for transaction utility. In other words, member-borrowers perceive the patronage payment as a "deal" and therefore extract value or utility from the transaction.

Given our sample stated in Table II that it is important for a lender to share its earnings with borrowers in the form of a patronage payment and they are willing to pay a higher interest rate for this patronage payment, the sample more than likely viewed these hypothetical loan options with patronage payments as a "deal". This perceived value of a "deal", however, might differ within the sample. Model 2 in Table III shows member-borrowers that work off the farm exhibit a statistically different preference for expected patronage payments versus interest rates. In particular, those farmers who work off the farm have a stronger preference for lower interest rates than higher expected patronage payments compared to those farmers that do not work off the farm. The marginal rate of substitution illustrates this point. A 1 percent increase in expected patronage payments and a 1.33 percent increase in interest rates will hold utility constant for a farmer who works off the farm. For those farmers that do not work off the farm, the same 1 percent increase in expected patronage payments must be accompanied by a 1.57 percent increase in interest rates to hold utility constant. Both sets of farmers still prefer higher expected patronage payments over lower interest rates, but farmers who work off the farm have a stronger preference for lower interest rates than their counterparts.

Conclusions

This article has explored preferences of member-borrowers with Farm Credit Services of East Central Oklahoma for higher expected annual cash patronage payments or lower fixed real estate interest rates. Using conjoint analysis, these member-borrowers resoundingly prefer patronage payments. Their preferences for these patronage payments are so high that, on average, they are willing to pay higher interest rates.

This is an interesting result and one that warrants further analysis. Our sample appears to view the hypothetical loan options with a patronage payment as a "deal" and prefers these loan options over the loan options that merely had lower interest rates. Would other cooperative members exhibit this same strong preference for a patronage program? This question is often discussed within any cooperative and especially among associations within the FCS.

Another extension of this work would be to analyze the preferences for a patronage program of other member-borrowers within the FCS. Probably the most notable FCS association to recently pay a cash patronage is Farm Credit Services of America (FCSA). This payment was a distribution of excess equity capital and an attempt to restore goodwill with its member-borrowers after the attempted sale to Rabobank (Jolly and Roe, 2005). If FCSA member-borrowers are similar to East Central Farm Credit member-borrowers in our survey, then the "deal" they received from a cash patronage payment may have restored some goodwill.

Finally, our results indicate that the heterogeneity within our sample did influence these preferences. Those that did not work off the farm had a stronger preference for patronage payments than those member-borrowers that did work off the farm. However, both still preferred higher patronage payments over lower interest rates. Thus, the ultimate finding of this study is that East Central Farm Credit member-borrowers have strong and positive preferences towards the cash patronage payment program.

Notes

1. Another method an FCS association could distribute their patronage is through nonqualified distributions. These distributions are not subject to taxes, while qualified

distributions are subject to taxes. Since the FCS association of interest in this study only pays qualified distributions to their member-borrower, all references to patronage payments are considered qualified.

2. One could impose *ad hoc* assumptions of the probability of receiving a patronage payment into the survey design but this was not possible because the East Central Farm Credit senior management team did not want to attach any probability to these hypothetical loan options. This does not diminish the results because East Central Farm Credit member-borrowers are informed by their loan officer that there is a possibility the board of directors may not distribute a cash patronage. Regardless, the survey design is still able to identify the tradeoffs between patronage payments and interest rates by East Central Farm Credit member-borrowers.
3. OLS models yield similar results.
4. Risk preferences might influence the tradeoff between patronage payments and interest rates. Survey respondents did answer a Likert scale question similar to the risk aversion index used by Katchova (2005). Farmers reported how comfortable they are in making risky decisions where one means willing to take on as much risk as possible and seven means avoid as much risk as possible. The average risk aversion was 4.5. Incorporating this risk aversion index in the regression did not significantly change the tradeoff between expected patronage payments and interest rates.

References

Beierlein, J.G. and Schrader, L.F. (1978), "Patron valuation of a farmer cooperative under alternative finance policies", *American Journal of Agricultural Economics*, Vol. 60 No. 4, pp. 636-41.

Blattberg, R.C. and Neslin, S.A. (1990), *Sales Promotion: Concepts, Methods, and Strategies*, 2nd ed., Prentice-Hall, Englewood Cliffs, NJ.

Boyle, K.J., Holmes, T.P., Teisl, M.F. and Roe, B. (2001), "A comparison of conjoint analysis response formats", *American Journal of Agricultural Economics*, Vol. 83 No. 2, pp. 441-54.

Chen, Y., Moorthy, S. and Zhang, Z.J. (2005), "Price discrimination after the purchase: rebates as state-dependent discounts", *Management Science*, Vol. 51 No. 7, pp. 1131-40.

Farley, T.A. and Ellinger, P.N. (2007), "Factors influencing borrowers' preferences for lenders", *Agricultural Finance Review*, Vol. 67 No. 2, pp. 211-23.

Farm Credit Administration (FCA) (2006), *Annual Report on the Farm Credit System*, Farm Credit Administration, McLean, VA.

Fulton, M.E. (1999), "Cooperatives and member commitment", *Finnish Journal of Business Economics*, Vol. 4, pp. 418-37.

Fulton, M.E. and Giannakas, K. (2001), "Organizational commitment in a mixed oligopoly: agricultural cooperatives and investor-owned firms", *American Journal of Agricultural Economics*, Vol. 5 No. 5, pp. 1258-65.

Greene, W.H. (2002), *Econometric Analysis*, 5th ed., Prentice-Hall, Upper Saddle River, NJ.

Hudson, D. (2007), *Agricultural Markets and Prices*, 1st ed., Blackwell Publishing, Hoboken, NJ.

Jolly, R.W. and Roe, J.D. (2005), "Selling a piece of the farm credit system", *Choices*, Vol. 20, pp. 19-24.

Kahneman, D. and Tversky, A. (2000), *Choices, Values, and Frames*, 1st ed., Cambridge University Press, Cambridge.

Katchova, A.L. (2005), "Factors affecting farm credit use", *Agricultural Finance Review*, Vol. 65 No. 1, pp. 17-29.

Lichtenstein, D.R., Burton, S. and Karson, E.J. (1991), "The effect of semantic cues on consumer perceptions of reference price ads", *Journal of Consumer Research*, Vol. 18, pp. 380-91.

Moraga-Gonzalez, J.L. and Petrakis, E. (1999), "Coupon advertising under imperfect price information", *Journal of Economics & Management Strategy*, Vol. 8 No. 4, pp. 523-44.

Norwood, F.B. and Lusk, J.L. (2008), *Agricultural Marketing and Price Analysis*, 1st ed., Prentice-Hall, Englewood Cliffs, NJ.

Rajendran, K.N. and Tellis, G.J. (1994), "Contextual and temporal components of reference price", *Journal of Marketing*, Vol. 58 No. 1, pp. 22-34.

Sykuta, M.E. and Cook, M.L. (2001), "A new institutional economics approach to contracts and cooperatives", *American Journal of Agricultural Economics*, Vol. 83 No. 4, pp. 1273-9

Thaler, R. (1985), "Mental accounting and consumer choice", *Marketing Science*, Vol. 4 No. 3, pp. 199-214.

Tversky, A. and Kahneman, D. (1992), "Advances in prospect theory: cumulative representation of uncertainty", *Journal of Risk and Uncertainty*, Vol. 5 No. 4, pp. 297-323.

United States Department of Agriculture/Economic Research Service (2008), Available at: www.ers.usda.gov/data/arms/app/Farm.aspx (accessed 13 October).

Urbany, J.E., Bearden, W.O. and Weilbaker, D.C. (1988), "The effect of plausible and exaggerated reference prices on consumer perceptions and price search", *Journal of Consumer Research*, Vol. 15 No. 1, pp. 95-110.

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