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## **What Did They Do with the Money? An Analysis of Tobacco Buyout Recipients' Expenditure Choices**

**Maria I. Marshall and Helen N. Pushkarskaya**

There are many expenditure options available to farmers who received a tobacco buyout check. A multinomial probit model is used to analyze how farmer, business, and household characteristics influence the choice of expenditure option. Results of the study show that farmers tend to use the tobacco buyout payments as a special income account which they spend in a focused manner, and their expenditure choices vary by gender and by age groups. Findings also reveal that farmers who plan to stay in tobacco production are more likely to invest in new or existing on-farm activities.

**Key Words:** defensive avoidance, expenditure choices, mental accounting, multinomial probit, tobacco buyout

In October 2004, the U.S. Congress passed legislation eliminating the tobacco program. This action forced a major reorganization of the Kentucky economy, as Kentucky is second only to North Carolina in terms of tobacco acreage and production. The six states with the most acreage are North Carolina, Kentucky, Tennessee, South Carolina, Virginia, and Georgia [U.S. Department of Agriculture/National Agricultural Statistics Service (USDA NASS), 2006]. According to NASS, 17 of the 20 most tobacco-dependent counties in the United States are in Kentucky. Thus, as one of the most tobacco-dependent states, Kentucky is particularly vulnerable to changes in the tobacco economy. The Tobacco Transition Payment Program (TTPP), also known as tobacco buyout, was designed to compensate tobacco quota owners for the elimination of tobacco quota assets and to provide compensation and transition assistance to tobacco growers and their communities. However, farmers decide individually how they are going to spend their tobacco quota, and this expenditure decision depends on farmers' age, education, on- and off-farm income, and overall lifestyle. Therefore, farmers' heterogeneity can significantly affect the effectiveness of the tobacco buyout program.

Several studies have been conducted on the impact of the tobacco buyout program (e.g., Gale, 1999; Gale, Foreman, and Capehart, 2000; Beach, Jones, and Johnston, 2005; Brown, 2005; Snell, 2005; Beach et al., 2006). These studies predicted that tobacco farming would follow other commodity crops and make the change from many farms with small amounts of acreage to fewer farms with larger amounts of acreage. These researchers also predicted that the demographics of the tobacco farmer would change as older farmers exit the market. No studies, however, have investigated what tobacco farmers would actually do with their tobacco buyout checks. Will tobacco farmers diversify into other on- or off-farm businesses? If it is true that older farmers will exit the market, then will they simply put the money in a retirement fund?

It has been suggested that tobacco farmers in Kentucky may start new businesses as an alternative to tobacco production and that this will revitalize rural economies. Will changes in the local economy and tobacco checks motivate farmers to start new businesses? These are important questions, as the actions of these farmers have an economic impact on tobacco-growing counties.

There are many expenditure options available to farmers who receive a buyout check. Farmers must make a decision about how to spend the money in an environment where they perceive the old lifestyle (i.e., complete dependence on the tobacco production) to no longer be a valid option. This could create incentives for farmers to act decisively and look quickly for alternative sources of income. However, the decision-making literature suggests defensive avoidance is a likely response to difficult choices in the presence of time pressure (Dhar, 1997; Payne, Bettman, and Johnson, 1988; Beattie and Barlas, 2001; Festinger, 1964; Janis and Mann, 1977). Will farmers choose to act quickly and aggressively invest in new on- or off-farm businesses? Or will they instead choose to wait before making a decision or just pay off debts in preparing for a clean start?

This paper reports on unique data from an ongoing experiment in the U.S. Appalachian region. Five hundred farmers were surveyed in Kentucky in order to determine the choices made by tobacco farmers with their buyout checks. We found that only approximately 50% of farmers spent their tobacco transition payments consistent with adjustment strategies suggested by Gale, Foreman, and Capehart (2000), i.e., invested in existing or new on-farm activities, or in retirement funds. Many farmers chose to pay off debts, pay the usual household expenses, or were undecided about how to spend their tobacco transition payments. Our analysis also suggests that personal characteristics, such as age, gender, and level of education, have a statistically significant impact on the individual's expenditure decision. In addition, the expenditure decision appears to be affected by important recent life events, such as a death in the household; by the farmer's propensity to access diverse sources of information (e.g., use of the internet to accumulate the information necessary for decision making); and by individual perception of the business climate in the community.

The paper is constructed as follows. First, a description is provided of the role of the Tobacco Transition Payment Program for the local economy after

elimination of the tobacco price quota program. A review of the relevant literature is then presented, and a list of hypotheses is formulated. Next, we describe the data and summary statistics. A section is then devoted to our analyses and results. The paper concludes with summary remarks and identification of some possible policy implications.

### **Tobacco Buyout Program**

The Tobacco Transition Payment Program, also called the “tobacco buyout,” was designed to help tobacco quota holders and producers make the transition from the Depression-era tobacco quota program to the free market and to prevent (or at least decrease) the recent continuous decline in net income for U.S. tobacco growers. The Fair and Equitable Tobacco Reform Act of 2004 (P.L. 108-357), signed by President Bush on October 22, 2004, provides annual transitional payments for 10 years to eligible tobacco quota holders and producers. Payments are funded through assessments of approximately \$10 billion on tobacco product manufacturers and importers. Different compensations are offered to quota owners and growers. Growers (or quota lessees) and quota owners receive compensation payments in the amount of \$3 per pound and \$7 per pound, respectively. Farmers who both owned and leased a tobacco quota (combined producers) receive a combined payment in the amount of \$3 per pound for leased quota and \$7 per pound for owned quota. Payments commenced in 2005, and continue through 2014.

The tobacco buyout program was expected to distribute approximately \$9.6 billion to tobacco growers and quota owners. Kentucky tobacco buyout recipients have been allotted \$2.5 billion, or 26% of the total buyout funds. Participants in our study will receive a total of \$34.7 million over the 10-year payment period.

The transition payments, if they are fully invested in new or old production activities, can remove (or significantly decrease) the negative effect of the elimination of the tobacco price quota on both the wealth and consumption levels of tobacco farmers. However, if farmers choose to invest only a portion of the transition payments in production activities, their wealth and consumption levels are likely to decrease during the transition period. Therefore, the expenditure decisions of individual farmers are likely to have a significant impact on local economic development. Accordingly, these circumstances motivate our objective to explore patterns and determinants of the expenditure choices of Kentucky tobacco farmers.

### **Literature Review**

#### *Tobacco Buyout and Adjustment Strategies of Tobacco Farmers*

Gale, Foreman, and Caphart (2000) suggest tobacco farmers can choose from three alternative strategies to adjust to the new economic environment. First, farmers can stay in tobacco production; in this case they will have to expand operations, raise productivity, and bear increased risk. Second, farmers can identify

and market an alternative crop or commodity, or seek alternative off-farm employment; in this case they will need to obtain financing for new on-farm or off-farm activities, or develop new skills to be competitive in the job market. Finally, some farmers can choose to retire; in this case they need to assure they have sufficient financial resources to support their households. Tobacco buyout payments can provide a valuable support to farmers who choose one of these adjustment strategies. The first group of farmers can invest their tobacco checks into expansion of their tobacco operations; the second group can invest their payments into new on-farm and off-farm business activities; and the third group can invest into retirement funds or in the financial market.

Gale, Foreman, and Capehart (2000) also note that various factors, such as production status (quota owners, tobacco growers, or combined producers), size of the farm, productivity of the land, farmers' age, and others, significantly affect the choice of adjustment strategy. For example, many tobacco quota owners were retired farmers and other individuals who were receiving rental income from tobacco quotas. After the elimination of the tobacco quota, these farmers are likely to use the tobacco buyout payments to create new financial assets that will substitute for the tobacco quota. Therefore, they are likely to invest their transition payments in retirement funds or in the financial market.

For tobacco growers, farm production costs, potential for expansion, and availability of alternative opportunities are important determinants of the choice of adjustment strategy. Larger producers are more likely to be able to successfully compete in the new economic environment due to economies of scale, and hence are more likely to choose to stay in tobacco production. Land productivity is another important factor that influences the choice of adjustment strategy; farms with higher productivity are more likely to choose to stay in tobacco production.

Land productivity in Kentucky follows regional patterns. Specifically, burley tobacco yields tend to be highest in central and western Kentucky, and lower in most mountainous Appalachian counties. Consequently, farms located in western Kentucky are more likely than farms located in eastern Kentucky to stay in tobacco production, and therefore these producers are more likely to choose to invest their tobacco payments in the expansion of tobacco production.

Many tobacco farmers are older. In Kentucky, the average age of burley tobacco growers is 50. However, the high profitability of tobacco attracted a relatively large number of young farmers (Gale, Foreman, and Capehart, 2000). It could be that after the elimination of the tobacco quota, young farmers are more likely to invest the transition payments in the expansion of their tobacco operations or in starting new enterprises. Older operators are more likely to continue growing tobacco on their small farms because they have limited alternatives; thus, they are more likely to use their transition payments as retirement savings, and either invest them in retirement funds or simply spend them on usual household expenses.

### *Expenditure Choices*

Research focusing on the expenditure choices of tobacco farmers can borrow from extensive literature related to how employees withdraw pension funds and the impact of the decision process on job change or retirement age (Warner and Pleeter, 2001; Atkins, 1986; Piacentini, 1990; Fernandez, 1992; Poterba, Venti, and Wise, 1998; Yakoboski, 1997; Hurd, Lillard, and Panis, 1998). This literature has analyzed the ways in which separating workers spent their cash-out, lump-sum pension settlements upon leaving. Piacentini (1990) reported that 40% of 1988 Current Population Survey (CPS) respondents consumed at least a portion of their lump-sum distributions. High-income families and older individuals saved more and consumed less than low-income families and younger recipients.

As documented by Yakoboski et al. (1994); Poterba, Venti, and Wise (1998); and Korczyk (1996), the most common items on which 1993 CPS respondents spent their cash-outs were (in decreasing order) savings accounts or other financial instruments, everyday expenses, debt repayments, and home loans. Small distributions were overwhelmingly spent on everyday expenses (the “magnitude effect”). Poterba, Venti, and Wise (1998) found that 1992 Health and Retirement Study (HRS) respondents (aged 51–61) saved or invested about one-fourth of their cash-outs and consumed the balance. Yakoboski (1997) reported that 50% of cash-out recipients had spent at least a portion of their distributions.

The above research suggests many farmers—especially younger farmers—might decide not to fully invest the tobacco payments into existing and new business activities in order to compensate for the losses caused by the elimination of the tobacco quota. Instead, they might choose to spend at least some part of the payments on the usual household expenses.

### *Defensive Avoidance*

A number of researchers have studied how individuals choose among several alternatives. Rational theory of search suggests the no-choice option should be chosen when none of the alternatives are seen as attractive, or when there are benefits to further searching (Karni and Schwarz, 1977). Psychological literature has found that consumers may decide not to choose in order to avoid making difficult trade-offs (Tversky and Shafir, 1992; Beattie and Barlas, 2001; Festinger, 1964; Janis and Mann, 1977). Dhar (1997) argues that the tendency to defer choice is greater when the difference in attractiveness among available alternatives is small.

Overall, the literature implies a significant number of tobacco farmers might defer or postpone a decision on how to spend the buyout payment. Moreover, we would expect that the same bias will cause a higher proportion of farmers to choose to pay off debts since it is a relatively passive option and allows individuals to have a fresh start.

### *Mental Accounting*

Thaler (1999) defines *mental accounting* as the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial operations. Even though the reasons for mental accounting are similar to those for regular accounting (i.e., to keep track of where money is going, and keep spending under control), the rules of mental accounting are somewhat different. As a result of these differences, contrary to regular accounting, mental accounting produces an interesting phenomenon: money in one mental account is not a perfect substitute for the money in another account. For example, Baker, Nagel, and Wurgler (2006) reported that investors are more likely to consume from dividends than from capital gains. Hatsopoulos, Krugman, and Potreba (1989) found that when takeovers generate cash to the stockholders, consumption does increase, while capital gains in the stock market tend to have little effect on consumption.

The above findings suggest tobacco farmers are likely to perceive tobacco transition payments as money that is “different” from the money coming from the regular sources of income, and consequently will spend these funds differently. They might choose to spend the check as it arrives in the mailbox (the “mailbox effect”), or they might assign this money to a specific expenditure account [“narrow framing,” i.e., general tendency to evaluate projects one at a time, rather than as a part of an overall portfolio as described by Kahneman and Lovallo (1993)].

Another important implication of mental accounting is that there is a hierarchy of money locations arranged by how tempting it is for a household to spend the money in each account (Shefrin and Thaler, 1988). The most tempting class of accounts is in the “current asset” category, such as cash, money market, checking accounts, or credit cards. The next class includes savings accounts, stocks and bonds, and mutual funds. An even less tempting category is home equity. Finally, the least tempting category is “future income” accounts, such as IRAs and 401(k)s.

According to Shefrin and Thaler (1988), the marginal propensity to spend a dollar of wealth in current accounts is close to 1, while the marginal propensity to spend a dollar of wealth of future income is close to 0. These findings imply that farmers who decided to pay off credit cards using tobacco buyout money are less likely to save than farmers who decided to invest the payments in retirement funds; or that farmers who were undecided about how to spend their transition payments and were keeping their money in checking or savings accounts are less likely to save than farmers who decided to invest their transition payments into various business activities.

### *Gender Differences*

Several studies reveal observed differences in risk attitudes and risk perceptions of financial decisions between genders. Even though the underlying mechanism is unclear, women demonstrate a higher degree of risk aversion (Hinz, McCarthy,

and Turner, 1997; Bajtelsmit and VanDerhei, 1996; Barsky et al., 1995). Jiana-koplos and Bernasek (1996) reported that women also perceive themselves to be less inclined to risk-taking. The implication is that women make less risky investment choices and consequently have lower returns to financial assets. Accordingly, we explored the possibility that gender may affect the expenditure decision.

#### *Effects of Internal Household Events*

A number of studies (e.g., Heck and Trent, 1999; Duncan, Stafford, and Zuiker, 2003) have demonstrated that there are extensive, bi-directional influences between family and work life. In particular, these influences include: (a) the type of occupation and the amount of income associated with the worker's role in the economy, (b) the combined effects of work-role characteristics and the demands associated with being a spouse or parent, and (c) the husband's and wife's combined work-role characteristics and how these combined demands are coordinated. Therefore, we expect that interruptions in the regular family routine, such as death of a family member or major illness of a family member, should have a significant effect on the choice of expenditure option.

#### *Hypotheses*

The literature reviewed above suggests the following list of hypotheses:

- H<sub>1</sub>: Smaller tobacco checks are more likely to be spent on usual household expenses.
- H<sub>2</sub>: Farmers who plan to continue to grow tobacco are more likely to invest their tobacco checks in existing on-farm activities.
- H<sub>3</sub>: Tobacco quota owners are more likely to invest their tobacco checks in retirement funds.
- H<sub>4</sub>: Producers with larger farms are more likely to invest tobacco checks in existing on-farm activities.
- H<sub>5</sub>: Expenditure choices vary across Kentucky production districts.
- H<sub>6</sub>: Expenditure choices vary across age groups.
- H<sub>7</sub>: Expenditure choices vary by gender.
- H<sub>8</sub>: Expenditure choices are affected by internal household events.

#### **Data and Sample Limitations**

This paper reports on unique data from an ongoing "natural experiment" in the U.S. Appalachian region. Rural Kentucky residents were surveyed to learn how they adjusted to the new economic environment following the elimination of the



federal price quota program. To collect a sufficient number of observations, the survey was originally mailed to 5,000 randomly selected rural households in Kentucky. We then followed up with phone calls to randomly selected households who did not respond to the mailed survey. Overall, 702 responses were received; 500 of the respondents were tobacco farmers who had received a tobacco buyout check. The data were collected during the summer of 2005 through the fall of 2006, when farmers had just started to receive their first buyout checks.

### *Questionnaire*

All respondents were asked to answer the following question. "What do you plan to do with the tobacco buyout money you receive?" They were provided with the following 13 alternatives: pay off debts, spend on usual household expenses, pay medical expenses, invest in retirement fund, invest in financial assets (e.g., stocks, bonds, CDs, mutual funds), invest in existing on-farm business activities, invest in existing off-farm activities, invest in new on-farm activities, invest in new off-farm activities, spend on one-time household expenses, spend on gifts or charities, undecided how to use this money, and other. Respondents were asked to choose all applicable alternatives.

Respondents were also asked to provide information about their demographic characteristics (age, gender, ethnicity, education, income, etc.), business characteristics (production status, number of farm activities in which they were involved, number of years they were a primary decision maker on the farm), significant internal household events (birth, death, marriage, divorce, major illness), whether they plan to continue to grow tobacco or change employment in the future, and the total dollar amount they expected to receive in tobacco buyout payments. In addition, respondents answered a number of questions about the business climate in their community and about their use of the internet (see table 1).

### *Descriptive Statistics*

Farmers' mean age was 55 years and 67% had at least some college education. Nineteen percent of the farmers surveyed were women. On average, participants received \$90,780 in tobacco transition payments, which ranged from as low as \$100 to as high as \$2,670,000. The vast majority of the respondents were white (96%), 12% had an income of less than \$30,000, and 14% had an income greater than \$120,000. Thirty-one percent were tobacco quota owners, 35% were tobacco growers, and 35% were combined producers. Forty-two percent used the internet to elicit information about the buyout program. Our respondents were distributed across the first, second, third, fourth, fifth, and sixth production districts as follows: 4%, 9%, 22%, 9%, 44%, and 10%, respectively.

**Table 1. Community Business Climate, Community Support, and Internet Usage Indices**

<b>Community Support Index (<math>\alpha = 0.61</math>)</b>	<b>Average of Scores of Items A1–A3<sup>a</sup></b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>A1.</b> State and local governments provide good support for people starting new businesses.	SD	D	N	A	SA
<b>A2.</b> Bankers and investors go out of their way to help new businesses get started.	SD	D	N	A	SA
<b>A3.</b> Other community groups provide good support for people starting new businesses.	SD	D	N	A	SA
<b>Community Business Climate Index (<math>\alpha = 0.66</math>)</b>	<b>Average of Scores of Items B1–B5<sup>a</sup></b>				
<b>B1.</b> Many people in my community start new businesses.	SD	D	N	A	SA
<b>B2.</b> People in my community talk about new business opportunities.	SD	D	N	A	SA
<b>B3.</b> Local county agents suggest new business possibilities.	SD	D	N	A	SA
<b>B4.</b> Several new companies opened in my community in the last three years.	SD	D	N	A	SA
<b>B5.</b> I will have to move to another community if I want to start a new business.	SA	A	N	D	SD
<b>Personal Internet Usage Index</b>	<b>Sum of Items C1–C3</b>				
<b>C1.</b> E-mailed friends and family in 2003	= 1 if yes; 0 otherwise				
<b>C2.</b> E-mailed friends and family in 2004	= 1 if yes; 0 otherwise				
<b>C3.</b> E-mailed friends and family in 2005	= 1 if yes; 0 otherwise				
<b>Business Internet Usage Index</b>	<b>Sum of Items D1–D18</b>				
<b>D1.</b> E-mailed county agent, farm supplier, or other organizations for farm or business-related activities in 2003	= 1 if yes; 0 otherwise				
<b>D2.</b> E-mailed county agent, farm supplier, or other organizations for farm or business-related activities in 2004	= 1 if yes; 0 otherwise				
<b>D3.</b> E-mailed county agent, farm supplier, or other organizations for farm or business-related activities in 2005	= 1 if yes; 0 otherwise				
<b>D4.</b> Purchased farm or business-related items over the internet in 2003	= 1 if yes; 0 otherwise				
<b>D5.</b> Purchased farm or business-related items over the internet in 2004	= 1 if yes; 0 otherwise				
<b>D6.</b> Purchased farm or business-related items over the internet in 2005	= 1 if yes; 0 otherwise				
<b>D7.</b> Sold farm or business-related items over the internet in 2003	= 1 if yes; 0 otherwise				
<b>D8.</b> Sold farm or business-related items over the internet in 2004	= 1 if yes; 0 otherwise				
<b>D9.</b> Sold farm or business-related items over the internet in 2005	= 1 if yes; 0 otherwise				
<b>D10.</b> Used internet to perform banking or investment activity in 2003	= 1 if yes; 0 otherwise				
<b>D11.</b> Used internet to perform banking or investment activity in 2004	= 1 if yes; 0 otherwise				
<b>D12.</b> Used internet to perform banking or investment activity in 2005	= 1 if yes; 0 otherwise				
<b>D13.</b> Printed or submitted tax or other business forms in 2003	= 1 if yes; 0 otherwise				
<b>D14.</b> Printed or submitted tax or other business forms in 2004	= 1 if yes; 0 otherwise				
<b>D15.</b> Printed or submitted tax or other business forms in 2005	= 1 if yes; 0 otherwise				
<b>D16.</b> Ran online advertisements in 2003	= 1 if yes; 0 otherwise				
<b>D17.</b> Ran online advertisements in 2004	= 1 if yes; 0 otherwise				
<b>D18.</b> Ran online advertisements in 2005	= 1 if yes; 0 otherwise				
<b>Usage of Internet to Obtain Information About Tobacco Buyout Index</b>	<b>Sum of Items E1–E3</b>				
<b>E1.</b> Acquired information about the tobacco buyout program in 2003	= 1 if yes; 0 otherwise				
<b>E2.</b> Acquired information about the tobacco buyout program in 2004	= 1 if yes; 0 otherwise				
<b>E3.</b> Acquired information about the tobacco buyout program in 2005	= 1 if yes; 0 otherwise				

<sup>a</sup> SD = strongly disagree, D = disagree, N = neutral, A = agree, and SA = strongly agree.

### *Sample Limitation*

There are several limitations to our sample. First, we did not ask respondents to provide information about what portion of the tobacco transition payment they plan to spend on each expenditure category. Instead, they were instructed to choose all applicable categories from the list on which they plan to spend the tobacco buyout checks. However, due to the narrow framing effect, farmers are likely to choose one major expenditure category. If our analysis supports this hypothesis, then this limitation is not likely to significantly affect our results.

Second, our respondents were not distributed across production districts proportionally to the actual tobacco farmers' population. Consequently, results of the analysis of the differences of expenditure choices across production districts should be treated with caution.

## **Analysis and Results**

### *Expenditure Patterns*

Fifty-seven percent of the respondents chose one expenditure category, 23.6% chose two, and 12.3% chose three expenditure categories. Only 7% of the respondents chose more than three expenditure categories. This result is consistent with the narrow framing effect.

To analyze the expenditure patterns further, we use a cluster analysis to form groups of farmers with the same expenditure patterns (see table 2). In particular, a two-step cluster analysis was employed with log-likelihood measure of distance, Akaike's information clustering criterion, and outlier handling. The cluster analysis resulted in six main groups. Eleven percent of the respondents did not follow any of the six expenditure patterns, and therefore were listed as outliers.

The discriminant analysis verified the classification of the groups, with 99.1% of cases correctly classified. Furthermore, the ANOVA confirmed the statistically significant differences between clusters with respect to the expenditure choices ( $p < 0.01$  across all expenditure choices). Table 2 describes the distribution of the expenditure choices by groups, which suggests a natural interpretation of the results.

- Group 1: *Disperse*. Farmers in this group (114) do not have focused expenditure choices. Some spend money on the usual household expenses, some invest money in the financial market, some invest money in new on-farm activities, and some indicate that their expenditure choices are not listed in the questionnaire. This group represents 22.8% of the sample.
- Group 2: *Undecided*. All farmers in this group (42) indicated they have not decided how to spend their tobacco payments, even though some of them stated they might spend some money on existing and new on-farm activities, or on usual household expenses. This group represents 8.4% of the sample.

- Group 3: *Retirement Funds*. All farmers in this group (46) revealed they plan to invest their transition payments in retirement funds. Twenty-four percent also indicated they will invest money in the financial market, 15% planned to invest in existing on-farm activities, and 13% planned to invest in new on-farm activities. Some of these farmers (< 9%) also planned to spend money on usual household expenses, pay off debts and medical bills, or existing off-farm activities. This group represents 9.2% of the sample.
- Group 4: *Active Farmers*. All farmers in this group (94) stated they plan to spend the tobacco transition payments on existing on-farm activities, and 20% indicated they plan to invest in new on-farm activities. Some farmers (< 9%) planned to spend the transition payments on usual household expenses, invest in financial markets, or in existing off-farm activities. This group represents 19% of the sample.
- Group 5: *Pay Off Debts*. All farmers in this group (91) indicated they plan to use the tobacco transition payments to pay off debts. Some farmers (< 4%) also planned to spend money on usual household expenses and medical bills, invest in a retirement fund, or in existing off-farm business activities, or new on-farm and off-farm business activities. This group represents 18% of the sample.
- Group 6: *Pay Off Debts/Farm*. All farmers in this group (57) stated they plan to use their tobacco payments to pay off debts and to invest in existing on-farm business activities, 21% planned to invest money in new on-farm activities, and 16% planned to spend money on usual household expenses. Some farmers (25%) also planned to spend money on medical bills, invest in retirement funds, financial markets, and other categories. This group represents 11% of the sample.

#### *Determinants of Expenditure Patterns*

To test hypotheses  $H_1$ – $H_8$ , we perform two groups of analyses. First, we employ multivariate ANOVA to analyze separately the effects of gender, income, and the decision to stay in tobacco production on farmers' expenditure choices. Second, multinomial probit analysis is used to estimate the combined effect of various personal, household, and community characteristics on farmers' expenditure choices.

The dollar amount of the tobacco payments in our sample was distributed lognormally ( $p$ -value = 0.40); therefore, the log transformation of the dollar amount was included as a regressor in the model. Descriptions of the variables used in the analyses are shown in table 3, and the sample descriptive statistics by expenditure groups are reported in table 4.

Table 5 reports correlation coefficients between independent variables in this study. Among the most important is a strong positive correlation between log transformation of dollar amount of the check received and plans to continue growing tobacco in the future. Including both variables in the regression might

**Table 2. Expenditure Patterns for Tobacco Buyout Recipients**

Description	Disperse		Undecided		Retirement Funds		Active Farmers	
	No.	%	No.	%	No.	%	No.	%
Pay off debts	0	0.0	2	4.8	4	8.7	0	0.0
Spend on usual household expenses	19	16.7	1	2.4	3	6.5	5	5.3
Pay medical expenses	1	0.88	0	0.0	2	4.3	0	0.0
Invest in a retirement fund	0	0.0	0	0.0	46	100.0	0	0.0
Invest in financial assets (e.g., stocks, bonds, CDs, mutual funds)	19	16.7	0	0.0	11	24.0	8	8.5
Invest in existing on-farm activities	0	0.0	3	7.1	7	15.0	94	100.0
Invest in existing off-farm activities	4	3.51	0	0.0	2	4.3	1	1.1
Invest in new on-farm activities	9	7.89	1	2.4	6	13.0	19	20.0
Invest in new off-farm activities	0	0.0	0	0.0	0	0.0	0	0.0
Spend on one-time household expenses	0	0.0	0	0.0	0	0.0	2	2.1
Spend on gifts or charity	1	0.88	0	0.0	0	0.0	0	0.0
Undecided about how to use this money	0	0.0	42	100.0	2	4.3	0	0.0
Other	15	13.2	0	0.0	2	4.3	3	3.2
Total	114	22.8	42	8.4	46	9.2	94	19.0

( extended ... → )

**Table 3. Description of the Model Regressors**

Variable	Description
Log	Log transformation of the total amount of buyout check received (in \$1,000s)
AMOUNT	Total amount of buyout check received (\$1,000s)
AGE	Age in years
FUTURE	= 1 if plans to grow tobacco in the future; 0 otherwise
MALE	= 1 if male; 0 otherwise
FEMALE	= 1 if female; 0 otherwise
WHITE	= 1 if white; 0 otherwise
NONWHITE	= 0 if white; 1 otherwise
EDUCATION	1 = no formal education, 2 = completed grade school, 3 = some high school, 4 = completed high school, 5 = some college/technical school, 6 = completed 4 years college, 7 = some graduate work, 8 = graduate degree
HIGH	= 1 if high school education or less; 0 otherwise
SOMECOL	= 1 if some college level class work completed; 0 otherwise
COLL	= 1 if 4 years college completed; 0 otherwise
GRAD	= 1 if education is higher than 4 years college; 0 otherwise
INCOME	Household income: 1 = less than \$29,999, 2 = between \$30,000 and \$79,999, 3 = between \$80,000 and \$119,999, 4 = greater than \$120,000
INCOME1	= 1 if household income is less than \$29,999; 0 otherwise
INCOME2	= 1 if household income is between \$30,000 and \$79,999; 0 otherwise
INCOME3	= 1 if household income is between \$80,000 and \$119,999; 0 otherwise
INCOME4	= 1 if household income is greater than \$120,000; 0 otherwise

( continued / extended ... → )

**Table 2. Extended**

Description	Pay Off Debts		Pay Off Debts/Farm		Outliers		Total	
	No.	%	No.	%	No.	%	No.	%
Pay off debts	91	100.0	57	100.0	20	36.0	174	35.0
Spend on usual household expenses	1	1.1	9	16.0	23	41.0	61	12.0
Pay medical expenses	2	2.2	3	5.3	15	27.0	23	4.6
Invest in a retirement fund	0	0.0	6	11.0	9	16.0	61	12.0
Invest in financial assets (e.g., stocks, bonds, CDs, mutual funds)	0	0.0	5	8.8	19	34.0	62	12.0
Invest in existing on-farm activities	0	0.0	57	100.0	24	43.0	185	37.0
Invest in existing off-farm activities	1	1.1	3	5.3	12	21.0	23	4.6
Invest in new on-farm activities	3	3.3	12	21.0	28	50.0	78	16.0
Invest in new off-farm activities	3	3.3	1	1.8	8	14.0	12	2.4
Spend on one-time household expenses	0	0.0	2	3.5	6	11.0	10	2.0
Spend on gifts or charity	0	0.0	1	1.8	10	18.0	12	2.4
Undecided about how to use this money	0	0.0	0	0.0	9	16.0	53	11.0
Other	1	1.1	0	0.0	12	21.0	33	6.6
Total	91	18.0	57	11.0	56	11.0	500	100.0

**Table 3. Continued / Extended**

Variable	Description
<i>OWNER</i>	= 1 if used to own tobacco quota but did not participate in tobacco production; 0 otherwise
<i>GROWER</i>	= 1 if did not own tobacco quota but rented it to grow tobacco; 0 otherwise
<i>COMBINED</i>	= 1 if own tobacco quota and possibly rented tobacco quota, and participated in tobacco production; 0 otherwise
<i>PROS</i>	Percentage of household income that came from tobacco in 2005 (%)
<i>CHANGE</i>	Change in percentage of household income that came from tobacco, 2002 to 2006 (%)
<i>BUSCLIMATE</i>	Community business climate index
<i>SUPPORT</i>	Community support index
<i>LANDOWN</i>	Land owned, acres
<i>LANDRENT</i>	Land rented, acres
<i>LANDTOTAL</i>	Land total, acres
<i>DECYRS</i>	Number of years as a primary decision maker on the farm
<i>DIVERSITY</i>	Number of additional on-farm activities besides tobacco
<i>EPERSONAL</i>	Personal internet usage – index
<i>EBUSINESS</i>	Business internet usage – index
<i>EBUYOUT</i>	Usage of internet to obtain information about tobacco buyout – index
<i>DEATH</i>	Experienced death in the family within last three years
<i>ILL</i>	Experienced major illness in the family within last three years
<i>DISTR1</i>	= 1 if located in production district 1; 0 otherwise
<i>DISTR2</i>	= 1 if located in production district 2; 0 otherwise
<i>DISTR3</i>	= 1 if located in production district 3; 0 otherwise
<i>DISTR4</i>	= 1 if located in production district 4; 0 otherwise
<i>DISTR5</i>	= 1 if located in production district 5; 0 otherwise
<i>DISTR6</i>	= 1 if located in production district 6; 0 otherwise

**Table 4. Descriptive Statistics by Expenditure Groups**

Variable	DISPERSE	UNDECIDED	RETIRE- MENT FUNDS	ACTIVE FARMERS	PAY OFF DEBTS	PAY OFF DEBTS/ FARM	OUT- LIERS	ALL
	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)	Mean/ (S.D.)
Log	4.2 (0.68)	4.42 (0.67)	4.65 (0.65)	4.43 (0.59)	4.59 (0.60)	4.82 (0.7)	4.5 (0.64)	4.51 (0.66)
AMOUNT	66.7	83.0	105.1	83.8	98.2	123.4	89.9	90.8
AGE	57.5 (12.91)	55.83 (15.24)	62.64 (12.67)	55.32 (14.68)	51.08 (13.38)	49.35 (13.79)	55.9 (15.5)	55.13 (14.32)
PROS	5.19 (14.82)	13.51 (25.35)	15.95 (21.16)	15.31 (21.97)	20.59 (25.20)	21.09 (24.16)	12.67 (21.82)	14.39 (22.37)
CHANGE	-4.77 (13.2)	-9.91 (19.66)	-10.39 (14.93)	-6.74 (15.93)	-15.53 (23.26)	-12.06 (20.51)	-12.49 (20.03)	-9.78 (18.49)
BUSCLIMATE	2.89 (0.67)	3.02 (0.57)	3.1 (0.58)	3.05 (0.64)	2.96 (0.63)	2.82 (0.64)	2.96 (0.67)	2.96 (0.64)
SUPPORT	3.06 (0.67)	3.23 (0.62)	3.13 (0.65)	3.13 (0.66)	3.11 (0.73)	3.13 (0.71)	3.29 (1.53)	3.14 (0.82)
LANDOWN	294 (522)	301 (520)	264 (272)	266 (298)	249 (341)	291 (290)	218 (210)	269 (340)
LANDRENT	420 (120)	183 (511)	103 (225)	163 (401)	310 (707)	257 (373)	171 (310)	252 (319)
LANDTOTAL	624 (354)	446 (657)	363 (353)	408 (569)	549 (921)	538 (540)	361 (374)	490 (374)
DIVERSITY	2.26 (1.0)	2.05 (0.96)	2.29 (1.38)	2.49 (1.06)	2.32 (1.08)	2.71 (1.02)	2.55 (1.7)	2.38 (1.17)
DECYRS	23 (14)	75 (30)	32 (14)	68 (29)	22 (13)	23 (14)	67 (27)	41 (17)
EPERSONAL	1.28 (1.09)	1.4 (1.11)	0.87 (0.96)	1.31 (1.15)	1.29 (1.13)	1.44 (1.18)	1.16 (1.02)	1.26 (1.1)
EBUSINESS	0.4 (0.67)	0.48 (0.63)	0.35 (0.57)	0.51 (0.74)	0.56 (0.87)	0.96 (0.98)	0.52 (0.81)	0.53 (0.78)
EBUYOUT	0.3 (0.46)	0.64 (0.48)	0.28 (0.46)	0.32 (0.47)	0.51 (0.50)	0.65 (0.48)	0.43 (0.5)	0.42 (0.49)
	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)
FUTURE	39 (0.36)	13 (0.46)	5 (0.56)	39 (0.51)	40 (0.55)	29 (0.6)	18 (0.56)	183 (0.51)
<b>Gender:</b>								
MALE	80 (0.73)	26.88 (0.64)	5 (0.86)	72 (0.77)	78 (0.87)	52 (0.93)	47 (0.87)	394 (0.81)
FEMALE	29 (0.27)	15.12 (0.36)	5 (0.14)	0 (0.23)	12 (0.13)	4 (0.07)	7 (0.13)	94 (0.19)
<b>Ethnicity:</b>								
WHITE	107 (0.99)	39.06 (0.93)	5 (1)	86 (0.93)	86 (0.97)	54 (0.96)	51 (0.94)	468 (0.96)
NONWHITE	1 (0.01)	2.94 (0.07)	5 (0.0)	0 (0.07)	3 (0.03)	2 (0.04)	3 (0.06)	18 (0.04)

( continued ... → )

Table 4. Continued

Variable	DISPERSE	UNDECIDED	RETIRE- MENT FUNDS	ACTIVE FARMERS	PAY OFF DEBTS	PAY OFF DEBTS/ FARM	OUT- LIERS	ALL
	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)	Number/ (%)
<b>Education:</b>								
<i>HIGH</i>	28 (0.22)	14 (0.28)	10 (0.23)	20 (0.2)	39 (0.40)	20 (0.32)	17 (0.27)	148 (0.27)
<i>SOMECOL</i>	29 (0.28)	8 (0.21)	10 (0.25)	24 (0.29)	11 (0.13)	15 (0.27)	11 (0.21)	108 (0.24)
<i>COLL</i>	29 (0.28)	6 (0.15)	10 (0.25)	23 (0.27)	8 (0.10)	10 (0.18)	12 (0.23)	98 (0.21)
<i>GRAD</i>	17 (0.04)	11 (0.1)	10 (0.05)	17 (0.01)	25 (0.08)	11 (0.07)	12 (0.04)	103 (0.05)
<b>Income:</b>								
<i>INCOME1</i>	10 (0.1)	7 (0.18)	5 (0.125)	11 (0.13)	14 (0.17)	2 (0.04)	8 (0.15)	57 (0.12)
<i>INCOME2</i>	52 (0.5)	16 (0.41)	21 (0.525)	43 (0.51)	38 (0.46)	31 (0.55)	25 (0.48)	226 (0.49)
<i>INCOME3</i>	26 (0.25)	11 (0.28)	9 (0.225)	20 (0.24)	17 (0.21)	10 (0.18)	16 (0.31)	109 (0.24)
<i>INCOME4</i>	15 (0.15)	5 (0.13)	5 (0.125)	10 (0.12)	14 (0.17)	13 (0.23)	3 (0.06)	65 (0.14)
<b>Production Status:</b>								
<i>OWNER</i>	17 (0.16)	12.92 (0.34)	21 (0.47)	31 (0.36)	24 (0.30)	14 (0.26)	21 (0.4)	141 (0.31)
<i>GROWER</i>	22 (0.21)	14.06 (0.37)	15 (0.33)	28 (0.33)	36 (0.44)	23 (0.43)	22 (0.42)	160 (0.35)
<i>COMBINED</i>	66 (0.63)	11.02 (0.29)	9 (0.2)	27 (0.31)	21 (0.26)	16 (0.3)	9 (0.17)	159 (0.35)
<b>Family Events:</b>								
<i>DEATH</i>	42 (0.37)	11 (0.26)	18 (0.39)	32 (0.34)	23 (0.25)	23 (0.4)	16 (0.29)	165 (0.33)
<i>ILL</i>	24 (0.21)	16 (0.38)	14 (0.3)	29 (0.31)	19 (0.21)	14 (0.25)	20 (0.36)	136 (0.27)
<b>Location:</b>								
<i>DISTR1</i>	6 (0.05)	1 (0.02)	0 (0.0)	4 (0.04)	4 (0.05)	1 (0.02)	3 (0.05)	19 (0.04)
<i>DISTR2</i>	5 (0.05)	7 (0.17)	3 (0.07)	9 (0.1)	7 (0.08)	6 (0.11)	6 (0.11)	43 (0.09)
<i>DISTR3</i>	36 (0.32)	6 (0.15)	4 (0.09)	19 (0.21)	18 (0.2)	10 (0.18)	15 (0.27)	108 (0.22)
<i>DISTR4</i>	4 (0.04)	2 (0.05)	6 (0.13)	11 (0.12)	10 (0.11)	4 (0.07)	5 (0.09)	42 (0.09)
<i>DISTR5</i>	44 (0.4)	18 (0.44)	25 (0.54)	40 (0.44)	42 (0.48)	26 (0.46)	21 (0.38)	216 (0.44)
<i>DISTR6</i>	8 (0.07)	7 (0.17)	6 (0.13)	6 (0.07)	7 (0.08)	8 (0.14)	5 (0.09)	47 (0.10)



**Table 5. Simple Correlations Between Independent Variables**

Variable	1	2	3	4	5	6	7	8
1. Log	1							
2. <i>FUTURE</i>	0.400**	1						
3. <i>AGE</i>	0.103*	0.008	1					
4. <i>MALE</i>	0.194**	0.131*	-0.130**	1				
5. <i>EDUCATION</i>	-0.118*	-0.167**	-0.121**	-0.036	1			
6. <i>INCOME</i>	0.257**	0.020	-0.041	0.165**	0.229**	1		
7. <i>OWNER</i>	-0.002	0.076	0.104*	-0.005	0.013	-0.046	1	
8. <i>BUSCLIMATE</i>	-0.042	-0.093	-0.007	0.029	0.067	0.024	-0.008	1
9. <i>SUPPORT</i>	-0.035	-0.036	0.037	-0.015	0.015	-0.036	0.031	0.023
10. <i>DECYRS</i>	0.022	-0.049	0.073	0.048	0.016	0.014	-0.011	0.065
11. <i>DIVERSITY</i>	0.169**	0.065	-0.066	0.039	0.088	0.050	-0.032	0.039
12. <i>EPERSONAL</i>	-0.118*	-0.155**	-0.375**	-0.017	0.356**	0.168**	-0.036	0.088
13. <i>EBUSINESS</i>	-0.062	-0.045	-0.383**	0.069	0.225**	0.100*	-0.062	0.042
14. <i>EBUYOUT</i>	0.135**	0.077	-0.261**	0.074	0.139**	0.091*	0.038	0.035
15. <i>DEATH</i>	-0.075	-0.086	-0.108*	-0.007	-0.076	-0.030	0.004	-0.019
16. <i>ILL</i>	-0.052	0.016	0.036	-0.079	0.037	-0.084	-0.003	-0.024

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

( extended . . . → )

result in multicollinearity; however, since we use 444 observations (farmers classified as outliers were excluded from the multinomial probit analysis), we chose to retain both of these variables to avoid biased estimates of the parameters.

Among other interesting results are positive correlations between income and log transformation of dollar amount of tobacco check, income, and education, and major illness and death in the family. Internet usage correlated positively with education and negatively with age. Three internet usage indices (personal, business, and buyout) were strongly positively correlated. All of these correlations have very intuitive explanations. To minimize the multicollinearity problem, the variables for income and major illness were excluded from the regression, and only one internet usage index was kept in the regression (usage of the internet to acquire information about the tobacco buyout program).

#### *Multivariate ANOVA*

The descriptive statistics in table 4 suggest that age, gender, production status, and plans to continue growing tobacco may significantly affect farmers' expenditure choices. A series of Mann-Whitney tests demonstrated that distributions across expenditure patterns varied for all independent variables ( $p < 0.01$ ). To investigate these effects further, we performed multivariate ANOVA analysis with the dependent variables *Disperse*, *Undecided*, *Retirement Funds*, *Active Farmers*, *Pay Off Debts*, and *Pay Off Debts/Farm*, and the independent variables of age,

**Table 5. Extended**

Variable	9	10	11	12	13	14	15	16
1. Log								
2. FUTURE								
3. AGE								
4. MALE								
5. EDUCATION								
6. INCOME								
7. OWNER								
8. BUSCLIMATE								
9. SUPPORT	1							
10. DECYRS	-0.005	1						
11. DIVERSITY	0.031	-0.007	1					
12. EPERSONAL	0.005	-0.006	0.070	1				
13. EBUSINESS	0.110*	-0.053	0.110*	0.565**	1			
14. EBUYOUT	0.023	-0.052	0.055	0.445**	0.353**	1		
15. DEATH	0.104*	-0.024	0.058	0.059	0.112*	0.063	1	
16. ILL	-0.004	0.051	-0.023	0.045	-0.023	0.033	0.135**	1

gender, production status, and plans to grow tobacco in the future. Table 6 reports the mean differences by independent variables across the expenditure patterns.

Results of the multivariate ANOVA demonstrate that farmers above age 64 were more likely to invest in retirement funds and less likely to spend tobacco checks on paying off debts. Meanwhile, farmers younger than 40 were more likely to invest in existing on-farm activities, and less likely to belong to the disperse expenditure group. Females were more likely to either belong to the disperse expenditure group, or be undecided about how to spend the tobacco transition payments. Males were more likely to choose to pay off debts and invest tobacco payments in existing on-farm activities. Quota owners were more likely to invest in a retirement fund, and less likely to belong to the disperse group. Farmers who belong to the disperse group were less likely to continue growing tobacco. These results support hypotheses H<sub>3</sub>, H<sub>7</sub>, and H<sub>6</sub>, but do not support hypothesis H<sub>2</sub>.

#### *Multinomial Probit Model*

Some of the expenditure patterns we derived using cluster analysis might be close substitutes. Therefore, a multinomial probit model (MPM) was used to analyze how farmer, business, and household characteristics influenced household expenditure patterns. LIMDEP Version 8.0 (Greene, 2002) was used to estimate the MPM.

To formulate the MPM we use the indicator function  $I_i$ , such that  $I_{ji}$  is equal to one if farmer  $i$  belongs to the expenditure group  $j$ , and zero otherwise. Therefore, the MPM may be specified as a linear combination of deterministic and stochastic components as follows:

**Table 6. Results of the Multivariate ANOVA Analysis**

Dependent Variable	Older than 64 [minus] 64 or Younger	Younger than 40 [minus] 40 and Older	Owner [minus] Combined Producers and Growers	Male [minus] Female	Grow Tobacco [minus] Quit Tobacco Production
	— Mean Difference —				
<i>Disperse</i>	0.109	-0.181*	-0.203*	-0.103**	-0.123*
<i>Undecided</i>	0.060	-0.002	0.006	-0.095*	-0.013
<i>Retirement Funds</i>	0.086**	-0.087	0.081***	0.041	0.030
<i>Active Farmers</i>	-0.056	0.145*	0.035	-0.034	0.005
<i>Pay Off Debts</i>	-0.155*	0.062	0.000	0.087	0.041
<i>Pay Off Debts/Farm</i>	-0.061	0.063	0.035	0.104*	0.060

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

$$\begin{aligned}
 (1) \quad & I_1 = \mathbf{x}'\beta_1 + \varepsilon_1, \quad \text{for } I_1 = I\{I_1 > 0\} \\
 & I_2 = \mathbf{x}'\beta_1 + \varepsilon_1, \quad \text{for } I_2 = I\{I_2 > 0\} \\
 & \dots \\
 & I_j = \mathbf{x}'\beta_1 + \varepsilon_1, \quad \text{for } I_j = I\{I_j > 0\},
 \end{aligned}$$

where  $\mathbf{x}_i$  is a vector of farmer, household, and business characteristics,  $\beta_j$  is the estimated coefficient, and  $\varepsilon_{ji}$  is the error term. Each  $\varepsilon_{ji}$  is drawn from the  $J$ -variate normal distribution with zero conditional mean and variance normalized to unity (for reasons of parameter identifiability), where  $\varepsilon \sim N(0, \Sigma)$ , and the covariance matrix is given by:

$$(2) \quad \Sigma = \begin{bmatrix} \sigma_1^2 & \dots & \sigma_{1J} \\ \vdots & \ddots & \vdots \\ \sigma_{J1} & \dots & \sigma_J^2 \end{bmatrix}.$$

We were particularly interested in off-diagonal elements of the covariance matrix,  $\sigma_{ij}$ , which represents the unobserved correlation between stochastic components of the  $s$ th and  $j$ th expenditure patterns. We do not expect to see any positive correlations, but potentially expect to see negative correlations, which will indicate that two expenditure patterns are close substitutes.

The *Active Farmers* group who invested the tobacco buyout payments into existing or new on-farm activities was used as a reference group, because we were interested in what factors motivate farmers to deviate from the major adjustment strategy—to invest in expanding tobacco production if they plan to continue to grow tobacco, or to invest in other on-farm activities if they plan to quit tobacco production.

### Results of the Multinomial Probit Analysis

The results of the MPM to evaluate Kentucky farmers' use of their tobacco buyout money are presented in table 7. Farmers who were receiving smaller checks were more likely to belong to the *Disperse* expenditure group than to the *Active Farmers* expenditure group, which was consistent with our hypothesis H<sub>1</sub>. Farmers who planed to continue to grow tobacco were less likely to be in the *Disperse* expenditure group but more likely to choose to pay off debts than the *Active Farmers* expenditure group. Quota owners were more likely to belong to the *Disperse* group than to the *Active Farmers* group, and less likely to be part of the *Pay Off Debts* group than the *Active Farmers* group.

Farmers' perception of how much support they can receive from their communities if they decide to start a new business significantly affected their expenditure choices. Farmers who did not think their community supported their business ventures were more likely to invest in retirement funds than in existing or new on-farm activities.

Life-cycle events and household disruptions may influence how individuals decide to spend their income. Households who experienced a death in the family within the last three years were more likely to belong to the *Disperse* expenditure group than the *Active Farmers* group, and less likely to choose to pay off debts than to invest in existing or new on-farm activities, which is consistent with hypothesis H<sub>8</sub>.

Recall that only one internet-related variable was left in the MPM because of the high correlation between personal and business internet usage, and obtaining information about the buyout over the internet. The variable that was left in the regression—use of internet to acquire information about the tobacco buyout—had a significant effect on the expenditure choices. Farmers who obtained information via the internet about the buyout were less likely to belong to the *Disperse* expenditure group than the *Active Farmers* group, but more likely to belong to the *Undecided* or *Pay Off Debts* expenditure groups than the *Active Farmers* group.

The correlations between the error terms associated with the expenditure groups were not significant, with one exception. The correlation between error terms associated with the *Pay Off Debts* and *Pay Off Debts/Farm* expenditure groups was equal to  $-0.51$  and was significant at the 1% level. This result reveals these two groups are close substitutes, which is intuitive.

The MPM did not reveal significant effects for gender, age, or diversity on the choice of the expenditure pattern, consistent with our hypotheses, probably because of the correlation between several of our independent variables. Additionally, the location variables did not have a statistically significant effect on expenditure patterns as we had predicted, possibly because we did not have sufficient representation from each region.

**Table 7. Multinomial Probit Results for Kentucky Farmers' Expenditure Choice**

Variable	DISPERSE	UNDECIDED	RETIREMENT FUNDS	PAY OFF DEBTS	PAY OFF DEBTS/ FARM
	Coefficient/ (Std. Error)	Coefficient/ (Std. Error)	Coefficient/ (Std. Error)	Coefficient/ (Std. Error)	Coefficient/ (Std. Error)
Constant	-1.31*** (0.21)	-1.56*** (0.32)	-1.21*** (0.28)	-0.81*** (0.16)	-1.34 (0.15)
Log	-0.001*** (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>FUTURE</i>	-0.001*** (0.00)	0.00 (0.00)	0.00 (0.00)	0.001** (0.00)	0.00 (0.00)
<i>AGE</i>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>MALE</i>	0.00 (0.00)	0.00 (0.03)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>SOMECOLL</i>	0.09 (0.14)	0.00 (0.21)	0.00 (0.17)	-0.08 (0.16)	0.03 (0.17)
<i>COLL</i>	0.21 (0.15)	-0.02 (0.22)	0.04 (0.18)	-0.27 (0.16)	-0.09 (0.13)
<i>GRAD</i>	-0.30** (0.15)	0.02 (0.20)	-0.04 (0.20)	0.35** (0.15)	0.07 (0.12)
<i>OWNER</i>	0.001* (0.00)	0.00 (0.00)	0.00 (0.00)	-0.001** (0.00)	0.00 (0.00)
<i>BUSCLIMATE</i>	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>SUPPORT</i>	0.00 (0.00)	0.00 (0.00)	-0.001*** (0.00)	0.00 (0.00)	0.00 (0.00)
<i>DECYRS</i>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>DIVERSITY</i>	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
<i>EBUYOUT</i>	-0.31* (0.19)	0.48* (0.29)	-0.11 (0.27)	0.35** (0.17)	0.55*** (0.21)
<i>DEATH</i>	0.30* (0.18)	-0.10 (0.25)	0.09 (0.26)	-0.29* (0.17)	0.12 (0.22)
<i>DISTR6</i>	0.10 (0.27)	0.29 (0.35)	0.36 (0.31)	-0.20 (0.23)	0.22 (0.29)
<i>DISTR1</i>	0.03 (0.31)	-0.19 (0.84)	-0.24 (0.99)	-0.01 (0.32)	-0.05 (0.57)
<i>DISTR2</i>	-0.30 (0.34)	0.41 (0.31)	-0.05 (0.49)	-0.08 (0.26)	0.01 (0.25)
<i>DISTR3</i>	0.45*** (0.18)	-0.21 (0.29)	-0.38 (0.40)	0.11 (0.20)	-0.25 (0.34)
<i>DISTR4</i>	-0.29 (0.30)	-0.30 (0.49)	0.31 (0.42)	0.18 (0.22)	0.06 (0.33)

*R*(Pay Off Debts, Pay Off Debts/Farm): Correlation Coeff./ (Std. Error) = -0.51\*\*\* (0.05)

Log Likelihood = -757.437

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

### Summary Remarks and Policy Implications

Overall, results of the analyses supported the majority of our hypotheses. Farmers tend to use the tobacco buyout payments as a special income account that they spend in a focused manner, smaller checks tend to be spent on usual household expenses, and farmers who plan to stay in tobacco production are more likely to invest in new or existing on-farm activities. Expenditure choices vary by gender and by age groups.

Many farmers (approximately 20% of our sample) chose to invest their money in existing or new on-farm activities, or in retirement funds, which is consistent with the adjustment strategies suggested by Gale, Foreman, and Capehart (2000). However, our results suggest that tobacco quota owners are not the only group choosing to invest their tobacco transition payments in retirement funds. Farmers who believe they do not receive sufficient support from the community when starting new business ventures also are likely to invest their tobacco payments in retirement funds, probably because they want to secure their future. Possibly, an increase of awareness about various support systems available in the community could motivate farmers to reconsider their expenditure choices and invest more in existing or new on-farm activities.

A significant portion of farmers (11%) were undecided about how to spend their tobacco transition payments. Females were more likely to be undecided about their expenditure choices, which probably could be explained by defensive avoidance. Farmers who were looking for additional information about the buyout program also were likely to be undecided about their expenditure choices, possibly because they perceived this problem as very complicated, and were seeking additional help on the internet. This is also consistent with the defensive avoidance hypothesis and may suggest another policy intervention. Specifically, sites that provide information about the tobacco buyout program could emphasize that while thinking carefully about expenditure choices is important, postponing the decision may result in a decrease in both wealth and consumption level. For example, money that is simply put into a checking account is likely to be spent on everyday expenses.

Almost 19% of farmers in our sample chose to focus on paying off debts. Farmers who had higher education and farmers who obtained information about the tobacco buyout were more likely to belong to this group. While the first group of farmers potentially could have higher student loans and need to repay them, the second group is likely to choose this expenditure pattern because of defensive avoidance. This result suggests that internet sites offering information about the tobacco buyout program need to provide more information about positive and negative consequences of using all tobacco payments to pay off debts. Approximately 24% of our sample did not have targeted expenditure choices. Females and tobacco growers were more likely to belong to this group; therefore, they probably could benefit from targeted assistance programs.

Findings of our analysis reveal approximately 70% of the tobacco farmers spent the tobacco transition payments consistently with the adjustment strategies suggested by Gale, Foreman, and Capehart (2000), which could affect the overall effectiveness of the tobacco buyout program. However, we cannot make stronger conclusions about the effect these expenditure options have had on the Kentucky economy based on our analysis. Additional study of the structural changes in Kentucky's rural economy is needed to answer that question.

The data analyzed here were collected during the period from summer 2005 to fall 2006, when farmers had just started to receive their first buyout checks. We expect that over time, distribution of choices over expenditure options will change as farmers have more time to evaluate their alternatives and a new economic reality. Specifically, we expect people will move away from the "Undecided" category and toward other categories. We plan to re-interview the same respondents in 3–4 years and analyze the dynamics of their expenditure choices as well as factors that influence those choices.

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