Factors Influencing Farm Operator Expectations on Future Levels of Government Support

By Tyler B. Mark, Joshua D. Detre, Jeremy D'Antoni, and Ashok K. Mishra

Abstract

Using the 2001 ARMS, we investigate farm operator expectations regarding the continuation of government payments. Given the farmer expects payments to continue, we further investigate the expected direction of changes in payments. The 2001 Farm Bill was being debated at the time of the survey while the previous Farm Bill, the 1996 FAIR Act, was more market-oriented than previous legislation. Following the significant changes in the previous bill, this data provides an interesting glimpse into how the changing nature of the previous legislation influenced expectations for future agricultural policy. Significant variables influencing a farmer operator's expectations for continued government payments and level of support include education, age, off-farm income of primary operator, off-farm income of the spouse, farm type, increased farm debt since 1996, and usage of risk management strategies.

Introduction

From 1996 through 2008, the federal government has distributed an average of $15.4 billion annually to U.S. farms through various government payment programs (USDA, 2010). Such payments include fixed direct payments, counter-cyclical payments, loan deficiency payments, marketing loan benefits, commodity specific program payments (tobacco, peanuts, and milk), conservation program payments, and ad hoc emergency and disaster payments (Table 1). The policies establishing these payment programs are the attempt of Congress to redistribute income in response to pressure from voters and farm lobbyists (Gardner, 1987). Policy changes were also in response to pressures from the international community and World Trade Organization to decrease price distortions in agricultural commodities stemming from government intervention (Burfisher and Hopkins, 2003).

The 1996 Federal Agricultural Improvement and Reform Act (FAIR), sometimes known as the Freedom to Farm bill, was written when the global economy was booming, demand for farm goods was being driven by expanding Asian economies, farm commodity prices were high, and farmers were demanding less government intervention (Westcott et al., 2002). All of these factors served as the catalyst for writing a farm bill that attempted to meet the demands for more market-oriented and less government dependent agriculture (Coble et al., 2002; Burfisher & Hopkins, 2003). With the FAIR Act, the U.S. adopted decoupled Production Flexibility Contract Payments (PFC) and terminated coupled target-price-based deficiency payments.




Tyler B. Mark works in the Department of Agricultural Sciences at Morehead State University in Morehead, Kentucky. Joshua D. Detre, Jeremy D'Antoni, and Ashok K. Mishra work in the Department of Agricultural Economics and Agribusiness at the LSU AgCenter and Louisiana State University in Baton Rouge, Louisiana.

There were concerns, however; that the 1996 Farm Act was too radical of a departure from the safety net that agricultural policy traditionally provided U.S. farmers as U.S. net farm incomes declined by over $7 billion from 1997 to 1998 (Westcott et al., 2002). The collapse of the Asian economies, coupled with weather disasters and the expansion of crop acreage, were the root causes for the financial crisis faced by US farmers. Consequently, farmers pled with the federal government for emergency assistance and Congress responded. Between 1998 and 2001, approximately $27 billion in emergency farm aid was given to U.S. farmers (Westcott et al., 2002).[1]

These factors set the stage for discussions preceding the 2002 Farm Act. Many producers argued that the government should focus on building automatic reliefs into the next farm bill rather than reacting to farm disasters as they occur. Most still supported planting flexibility and decoupled production flexibility contract payments provided all of which provide financial assurances to farm operators (Westcott et al., 2002). In addition, there was increasing pressure on U.S. agricultural policy to comply with international trade agreements, in particular the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO). The international community is a proponent of decoupled payments because they do not affect output quantities and prices; therefore, the international trade distortions created by these income transfers are minimal and considered acceptable payments for member countries (Burfisher & Hopkins, 2003; Bhaskar & Beghin, 2009). Conversely, increased coupled government payments result in increased quantities of the commodity produced domestically (Serra et al., 2011). Finally, May (2011) finds that decoupled payments in a global network are welfare improving. To the chagrin of our trade partners, coupled payments result in downward pressure on worldwide commodity prices due to surplus goods produced under the higher payments. With that being said research by Ellison, et al. (2009) shows that the non-U.S. farm sector supports government subsidies to U.S. farmers as a method for ensuring a secure food supply. Their results indicate that policy-makers are going to get little to no pressure from the non-farming community about reducing support to farms.

The examination of farmer expectations of future government payment is relevant for future policy discussions and Farm Bills. Both farmers and policymakers have for years aimed to decrease the reliance of farmers on government assistance, increase the market orientation of farming, and create safety nets that are more proactive than reactive in farm crises. To this point, these efforts have not been successful since 80 percent of emergency funds paid to farmers from 1998 to 2000 were intended to offset price declines rather than production shocks from natural occurrences (Edwards & DeHaven, 2001). This fails to accomplish US policy goals domestically and internationally. The value of this research does not lie in simply advancing the knowledge of farmers' sentiments following the 1996 Fair Act. The more valuable contribution is development of a foundation for projecting farmers' expectations of government payments into future periods and assesses their likely reaction to future policy discussions and actions.

This study examines farmers' expectations for government support, whereas previous literature focused on analyzing specific policies, such as "decoupling" of payments or payment limits. Research on policy preferences has utilized expected utility theory (Coble et al., 2002; Orate et al., 1989) or public choice theory (Scrimgeour & Pasour, 1996) to analyze the preferential differences between specific farm policies. Where government support encompass all payments to the farm sector (direct payments, counter-cyclical payments, marketing loan benefits, loan deficiency payments, emergency and disaster payments, tobacco transition payments, and conservation program payments, etc.).

In the late 1980s, Orazem et al. (1989) found that a farm's financial situation and size were significant factors in policy perception. Edelman and Lasley (1988) also found that financial stress, size, and age of the farmer played a significant role in the type of farm policy preferred by Iowa farmers. While the aforementioned research provides valuable insight into the relationship between farm policy preferences and farm operation characteristics, it did not address the effects of off-farm income and geography (studies were limited only to farmers in Iowa). Farmers and their families now more than ever rely on off-farm income to increase and stabilize household income. Mishra et al., (2002) point out that more than 85 percent of total household income comes from off-farm activities. The share of off-farm income and total household income, though, varies with the farm type and geographical location of the farm operation.

This paper expands upon previous literature by using a national data set and discrete choice probit model to analyze farmers' expectations for government support and the factors influencing perceptions of farm policy and government payments following the enactment of FAIR in 1996. This study uses data from the 2001 Agricultural

Resource Management Survey (ARMS), which is a national survey, comprising farms of different economic sizes and in different regions of the U.S. Unique to this survey year, questions were included soliciting farmers' expectations regarding government support. This dataset provides a unique perspective on agricultural policy changes that is relevant to today's Farm Bill discussion. Following the significant changes in the 1996 Farm Bill, this data provides an interesting glimpse into how the changing nature of the previous legislation affected expectations for future agricultural policy. In the current Farm Bill discussions, it appears more likely that policy will move in a direction opposite the 1996 legislation and essentially eliminate decoupled government payments. With the tightening government budgets, we also expect the magnitude of total government payments to decline as well. This research may provide important insights into how farmers will adapt expectations in the context of this latest shift in both payment structure and magnitude. Assuming efficient market for land, the price of land will reflect the expectations of future cash flows for farmers. This research may help us gain further understanding of how changes in the current Farm Bill debate will influence farmland valuations.

Empirical Model

Qualitative choice models are appropriate when trying to determine the characteristics of an individual that influence his/her decisions. Probit models are a type of qualitative choice model based on utility theory, or rational choice perspective on behavior (for more detail see McFadden, 1973). Assuming that farmers maximize their expected utility of profits, subject to constraints imposed by the characteristics of their marketing and production environment, and that this is true as it relates to farmers determining their expectations for farm policy, a probit model is logical choice for modeling farmer decisions (Goodwin, 1993). Characteristics that can influence these expectations include the traits of the farmer, type of farm, and specific qualities of the farm operation.

In the Farm Operator section of the ARMS, two questions are posed to farmers currently receiving government payments on the subject of expectations of government support. The first question on government support asked, "Do you expect government support regardless of price developments during the next four years?" We estimate a probit model to determine characteristics that influence the probability of a farm operator receiving *government support*.

The second question on government support asked, "Do you expect to receive about the same level of government support for this operation during the next four years?" There are three unique values that the dependent variable *government dollars* may assume and they are: *expect more; expect less; and same/unsure*. For this question, we utilized a multinomial probit (MNP) model. The MNP is the appropriate form of the probit model to use when the discrete dependent variable can take on more than two outcomes and there is no natural ordering.

The reduced form equation for question one is given by

$$(1) \qquad P_i = f(X_i, \gamma_i, \theta_i)$$

Where P_1 is defined as the probability that $farmer_i$ expects to receive government support irrespective of commodity price over the next four years. X_1 is defined as traits of the farmer including age, gender, experience, percent of land owned, education level, and whether the farmer and spouse are full or part-time employees of the farm. γ_1 is defined as the type of farm based on estimated value of production of commodity(s) relative to the total value of all commodities (ERS, 2006). θ_1 is defined as all other variables. For question two, the reduced equation is the same with exception to the interpretation of P_1. P_1 is now defined as the probability of $farmer_1$'s expectation on the level of government support for his/her operation during the next four years.

The literature indicates several factors that would affect a farmer's preference of agricultural policy. For example, both Edelman and Lasley (1988) and Orazem et al. (1989) conclude that financial strength, measured by debt-to-asset ratio, plays a significant role in a farmer's preferences for policy. While the current research measures expectations rather than preferences, it is likely that the financial position of the farm affects the farm operator's future expectations on government policy. Consequently, this paper also incorporates the farm debt-to-asset ratio (total farm liabilities divided by assets). The Farm Financial Standards Task Force (Forbes, 1991) indicates that the higher the ratio, the greater the financial risk and the lower the borrowing capacity of the farm operation. Moreover, those farm operators who believe government payments are likely to continue would be more inclined to increase the debt position of the operation, i.e., maintain a higher farm-debt-to-asset ratio and by definition greater financial risk. This occurs because operators feel that their future farm incomes are more stable and are therefore less concerned about their ability to meet future debt obligations. Thus, our *a priori* expectations are that higher farm debt-to-asset ratio the higher the probability of expecting government support, irrespective of prices.

Additional variables that may affect farmers' expectations of policy include educational attainment of the farm operator, farm size, operator's age, days worked off-farm, farm type (i.e., corn, soybean, and livestock, etc.), gender of the farm operator, ownership of land, and net worth (Edelman & Lasley, 1988; Orazem et al., 1989; Coble et al., 2008). This study includes all of these variables, with some minor modifications made to net worth and days worked off-farm. Finally, it includes the attributes of a spouse's off-farm work. This is consistent with Mishra et al. (2002) who assert that farming decisions are household decisions, and the spouse plays an important role in the income and wealth generation capabilities of the household. Ahearn et al. (2006) examined whether the shift to decoupled payments in the 1996 Farm Act affected the off-farm labor participation decisions of farm households. They found that increased government payments (all types) had a differential impact on farm operators and their spouses. Increased payments resulted in a lower probability of farm operators working off-farm in 1996 and 1999, but they had no effect on farm spouses in 1996 and a negative correlation in 1999. Furthermore, El-Osta et al. (2008) showed that a $10,000 increase in expected government payments resulted in a nine percent increase in the likelihood of the spouse working off-farm.

The literature also shows that differential impacts on farm labor exist based upon the type of government payment. Findeis (2002) shows that increased coupled government payments will tend to increase the number of hours a farmer devotes to farm labor and increase output of the product tied to the coupled payment. Dewbre and Mishra (2002) show that an increase in decoupled payments, assuming the farm household allocates some time to off-farm labor, will decrease the hours worked on farm, increase the hours devoted to leisure, and have no effect on the production decision of the farmer.

Farmers' education has one of five education levels ranging from did not finish high school to graduate level work completed. The expectation for education is that as education levels increase, there is a decreased probability of expecting government support. This is consistent with the fact that returns to education are on average higher from working off the farm than from farming (Mishra et al., 2002). Farm raised is simply whether or not the operator was raised on a farm and is expected to increase the probability of expecting government payments. Farmers have been receiving payments for decades, so individuals raised under those circumstances are more likely to expect those conditions to continue in the future as a way of life. Age of the farm operator is included in the model to assess the effect of life cycle on government payments. Orazem et al. (1989) found that as the age of the farmer increased, the type of policy preferred shifted from commodity payment to conservation type payments. The expectation for age is that the older the farmer, the higher the probability of expecting government support. Farmers have been receiving payments regardless of market price since 1933, so the idea of government support has been ingrained in the farming culture for over seven decades. The expectation for both the tenant and part owner is that they will have a positive contribution to the probability of expecting government payments. Since these farmers own none or part of the land they operate respectively, they would have an easier time exiting the industry if government payments went away relative to farmers who own all of their land. Moreover, research shows that landowners are unlikely to capture all of the benefits associated with commodity programs (Barnard et al., 2001).

Unlike previous studies that included the number of days worked off-farm, this study includes information on the intensity of off-farm work performed by farm operators and their spouses. For example, the study will include whether the farm operator and spouse work off the farm full-time or part-time. The ARMS collects information on the number of hours per week the farmer and spouse work off-farm. The expectation for off-farm labor is that the probability of expecting government payments decreases for a part-time farmer. We have no *a priori* expectation of how a spouse's off-farm work affects the operator's expectation of receiving government payments and future level of government support.

Where previous studies only focused on corn, soybean, and livestock farms (Edelman & Lasley, 1988; Orazem et al. 1989), this study also includes additional farm types and regional location variables. This study uses nine farm types defined in Table 2 (cash grains, wheat, corn, soybean, cotton, other field crops, high value crops, dairy, and general livestock) in the regression model (those farms which have greater than 50 percent of farm revenue from tobacco, peanuts, fruits, vegetables, and/or tree nuts are used as the reference farm type). The expectation is that wheat, soybeans, corn, cash grains, rice, and/or cotton farmers will have a higher probability of expecting government support compared to livestock, fruit, tree, and vegetable farmers[2].

We include three additional independent variables in our model specification to address whether the risk level of the farm affects a farmer's policy preferences. First, a count of the management strategies implemented to manage risk by the farm operator. This acts

as an independent variable in the model. These strategies include forward purchases, participation in buying clubs, and seeking farm management services for advice on inputs. Management strategies for outputs include collaborative selling, use options or futures, contract shipping, organic certification of crops, and livestock labeling (antibiotic-free and/or range-fed livestock). The notion here is that as the total number of strategies increases, the farm becomes less risky and the probability of expecting government support decreases. Secondly, a dummy variable on the use of production contracts by farmers is included. Our *a priori* expectations are that increased use of production contracts will decrease the probability of expecting future government support for the farm operation. The third additional variable included is a dummy variable on the use of marketing contracts employed to reduce output price risk. Our *a priori* expectation is that participation in marketing contracts reduces the probability of expecting government support.

Other additional explanatory variables included in the model are a measure of diversification, record keeping, increase in acres since 1996, and increase in debt since 1996. We expect those farms that keep records would expect government payments to continue. Operators who keep records should be able to observe that government payments have been around every year for the past several decades, and those operations have likely begun to rely on government payments as a known source of income that will continue in the near future. Furthermore, those farms that have been increasing acres and/or debt since 1996 would likely expect government payments to continue. This is consistent with the findings of Robert and Key (2008), who found that farmers are increasing acreage with government payments. If farmers expected that government payments were unlikely to continue into the future, they would halt farm operation expansion financed by debt, because future income streams would become less certain.

Data

Data for the analysis are from the 2001 Agricultural Resources Management Study (ARMS, formerly known as Farm Costs and Returns Survey (FCRS)), which is conducted annually by the Economic Research Service and the National Agricultural Statistics Service. The survey collects data to measure the financial condition (farm income, expenses, assets, and debts) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households.

The target population in the survey is operators associated with farm businesses representing agricultural production across the U.S. A farm is defined as an establishment that sold or normally would have sold at least $1,000 of agricultural products during the year. Farms can be organized as proprietorships, partnerships, family corporations, non-family corporations, or cooperatives. Data are collected from one operator, the senior farm operator, per farm. A senior farm operator is the operator who makes most of the day-to-day management decisions. For the purpose of this study, operator households organized as non-family corporations or cooperatives were excluded.

The 2001 ARMS survey collected information on farm households in addition to information collected through the regular survey. It contains detailed information on off-farm hours worked by spouses and farm operators. In addition, the survey also has data on the amount of income received from off-farm work, net cash income from operating another farm/ranch, net cash income from operating another business, and net income from share renting. All summary statistics for the variables along with a description of the variables used in the analysis are presented in Table 2.

Empirical Results

The results from our models generally fall in line with both our prior beliefs about farm operator perceptions of agricultural policy and with the previous literature. The parameter estimates for our probit estimations are presented in Table 3. As with all probit models, the coefficient on the parameter estimate does not give the magnitude of the effect, therefore the marginal effects (ME), evaluated at the means of the explanatory variables are also included in Table 3. Please note that these models are estimated using only operators who were receiving government payments at the time the ARMS survey was completed. Therefore, these results are the most meaningful for Heartland, Northern Crescent, Mississippi Delta, and the Southern Seaboard regions, i.e. those regions receive most of the government support.

It is highly likely that the debates occurring in 2001 concerning the 2002 Farm Bill were exerting some influence on the expectations of farm operators as they completed the 2001 ARMS Survey. Topics of discussion included: 1) the abolishment of the peanut quota system; 2) the reimplementation of counter-cyclical payments; and 3) the addition of commodities receiving program payments (e.g., soybeans, dry peas, lentils, and chickpeas) (Jurenas, 2002; Monke, 2005). While these are only three of the topics discussed, it is important to

understand their role in shaping farm operators expectations. For example, Heartland and Northern Great Plains expectations could be upwardly biased because more crops, specifically soybeans, are being discussed as potential crops to come under program payments.

Continuing Government Support

The model's parameter estimates and marginal effects for the question, "Do you expect government support regardless of price developments during the next four years (yes or no)?" can be found in Table 3. The significance of a majority of the variables is an indication that the model provides statistically significant information with respect to the impacts of explanatory variables on the expectation of government support during the next four years. The results of the probit model with corresponding marginal effects are presented in Table 3. Table 3 also provides information on the overall fit of the model. Since an R^2 does not accurately measure the fit of a probit model, a pseudo-R^2, the likelihood ratio, is calculated. The estimated model demonstrated a fairly superior capability, as indicated by a McFadden pseudo- R^2 value of 0.27.[3] The likelihood ratio is -2,142, representing a relatively good fit for a probit model (Hensher and Johnson, 1981).

With the exception of education (*educ*) and total management strategies (*totmgmt*), those variables that were positively statistically significant conform to our prior expectations. Other factors that significantly increase the probability that the farmer operator expects government support to continue during the next four years, irrespective of prices, are sex of the operator (*male*), age of the operator squared (*agesq*), if the operator is a tenant farmer (*tenant*), if the farmer is a part-owner (*powner*), if the farmer keeps records (*record*), if they were raised on a farm (*farmraised*), and if they have more debt than they did in 1996 (*moredebt*). Thus, farm operators who have what can be termed as historical experience (*farmraised, agesq, record*); can observe through the operation's historical records (i.e., oral, written, and/or mental), the likelihood of the operation continuing to receive government support. Mishra and El-Osta (2008) note that government payments increase returns and ease liquidity constraints, which means farmers are more apt to borrow additional funds if they want to expand or improve the farm operation. As shown by Featherstone et al., 1988, government programs that truncate downside risk increase the overall debt in a farm operation. This occurs because governmental support decreases the likelihood of financial distress and bankruptcy. Consequently, expectations that government support will continue to be a known part of an operation's future income stream would make a farmer less concerned about being unable to meet future debt obligations, because government support reduces the probability of financial distress. It is not surprising that when an operator is a tenant farmer (*tenant*) and/or a part owner (*powner*) has a positive and significant effect on expecting to receive government payments. Previous research, which shows government payments would make farming a more attractive occupation relative to other occupations, because the payments increase the economic viability of the farm operation (Goodwin et al., 2002; Mishra et al., 2002; Mishra & El-Osta, 2008).

While education is positively statistically significant, an additional year of schooling only generates a 0.82 percent increase in the probability of expecting government payments. Perhaps this small but significant increase occurs because educated farmer operators have a better understanding of the political climate surrounding farm policy and therefore make decisions that are informed by his/her knowledge of future farm policy, specifically the rules and regulations concerning these new programs and legislations.

Our *a priori* expectations were that increasing the number of risk management strategies employed by the farm operator would reduce the probability of expecting government support, however each additional management strategy incorporated by the farm operator actually resulted in a 3.25 percent increase in the probability of a farmer expecting government support. While our *a priori* reasoning is sound, a possible explanation for this result is that the farm operator realizes that government support and risk management strategies protect the farm from different forms of business risk and by using them in conjunction with other risk management, the farmer can grow and expand the operation without exposure to additional risk (Featherstone et al., 1988).

One factor that significantly decreases the probability that a farm operator expects government support to continue during the next four years, irrespective of prices, is off-farm wages of the operator (*adjwage_op*). By working off the farm, the farm operator generates income that is not dependent on the farm operation. Off-farm employment likely indicates that the operator believes future government payments will not continue. These results are consistent with the findings of Mishra and Goodwin (1997), who find that the variability in farm income, increased off-farm work for both farm operators and their spouses, and removal of government payments from a farm business's income stream would make farm income more variable.

The positive statistical significance for the farm type indicators for cash grains (*cg*), wheat (*wheat*), corn (*corn*), soybean (*soybean*), cotton (*cotton*), other field crops (*ofc*), and dairy (*dairy*) farm types relative to the reference farm type (either tobacco, peanuts, fruits, vegetables, and/or tree nuts) is not surprising, given that these farm types have historically received government support. Furthermore, many of these industries were at the center of the 2002 Farm Bill debates occurring in 2001, and much of the debate concerning the continued support for these crops was positive. Consequently, it should be expected that producers of the aforementioned crops expect continued support. Only high value crop (*hvc*) farm types exhibit negative statistical significance relative to reference farm type. This anomaly is attributed to the fact farm type has historically received very few government payments. Thus, the historical record and lack of policy discussion supporting government payments for *hvc* would cause these farm operators to believe the trend of no government support will continue.

Government Support Levels

Farm operators expecting government payments in the next four years also want to know what level of support they might receive. The results of the MNP model farm operator expectations. Table 4 contains the results for the MNP and the marginal effects. In our model, the base group is comprised of farmers who are unsure about the level of government support in their operation during the next four years. Consequently, the emphasis of this section of the results is to provide an analysis on those factors that that influence farm operator expectations on the level of government payments over the next four years.

Government Support Level Increases or Stays the Same

Table 4 provides a characterization of operators with higher government support level expectations relative to those farmers who are unsure about the direction of government support over the next four years, i.e., the unsure group is the reference group. If the operator is male, the likelihood of expecting the same or higher government support increases by 5.96 percent. The farm operator being a tenant (*tenant*) or part owner (*powner*) increases the likelihood of expecting the same or higher government support by 7.28 percent and 7.74 percent, respectively. This is not surprising, given the previously discussed research. An operator being farm raised (*farmraised*) also plays a positive and significant role on expectations of higher or the same level of government support. Generations of farm operators have received government payments, regardless of price and economic conditions, which has created an expectation among those operators who were farm-raised that this practice will continue into perpetuity. A farm acreage (*moreacres*) increase since the passing of the 1996 FAIR Act has a positive effect on the probability of expecting higher government support by a magnitude of 4.97 percent. This serves an indication that farmers believe more acreage in their operation will increase financial performance (Rathmann et al., 2010). The results also show that each additional management strategy (*totmgmt*) employed by the operator increases the probability of expecting higher government support by 2.27 percent. One would have expected that the more management strategies employed would have a negative effect on this probability. Incorporation and implementation of these strategies is expensive (time and effort). Consequently, farm operators who want to receive compensation for his/her time and effort realize that this compensation is only likely to occur if the future government payments they receive are equal or greater than what they are currently receiving.

When examining farm type indicators, positive statistical significance for the following farm types is observed: cash grains (*cg*), wheat (*wheat*), corn (*corn*), soybean (*soybean*), cotton (*cotton*), other field crops (*ofc*), and dairy (*dairy*) farm types relative to the reference farm type (either tobacco, peanuts, fruits, vegetables, and/or tree nuts). The operators of these farm types would expect the historical continuation of government support at an amount equal to or exceeding its current level. Furthermore, much of the debate leading up to the 2002 Farm Bill centered on the level of government support for counter-cyclical payments for program crops, which likely increased expectations on the level of government support (Monke, 2005; Jurenas, 2002). With the exception of the dairy farm type, the likelihood of expecting the same or higher government support exceeds 20 percent for all of the aforementioned farm types. High value crop (*hvc*) farm types exhibit negative statistical significance relative to reference farm type, which can be attributed to the fact these farm types have historically received few government payments.

Government Support Level Declines

Results in Table 4 shows that an additional year of schooling by the farm operator (*educ*) increases the likelihood that the farm operator thinks government payments will decline by almost 0.72 percent. As with the previous discussion on the likelihood of government payments occurring during the next four years, more education should enhance the operator's knowledge of existing and future farm policy. While operators who are more educated realize it is unlikely that

government payments will cease, they also understand that government payments at their current level will not continue as the U.S. moves towards a more free-market farm policy program, reducing of the federal deficits, and conforming to acceptable WTO agricultural policies. The dummy variable for off-farm employment for the farm operator's spouse (*adjwag_sp*) increases the probability of expecting the level of government to support to decrease. By having the spouse of the farm operator working off farm, the farm household is attempting to reduce reliance on the farm business, i.e., the expectation that government support will decline. Declining government support could lead to less income being generate by the farm operation and making off-farm employment crucial to the economic viability of the household.

The farm operator being a part owner (*powner*) increases the likelihood of expecting lower government support by 5.4 percent. In this situation, part ownership is desirable if the operator feels government support will decline and does not want to bear all of the ownership risk. An operator keeping records (record) and being farm raised (*farmraised*) also plays a positive and significant role in increasing the probability in the operator thinking there will be lower government support levels at the 2.7 percent and 3.62 percent respectively. Operators who have been raised on a farm and those who have kept records have observed the historical trends associated with government support for their farm type. It is likely these farm operators have observed a declining trend in government support in their operation. The fact that more debt (*moredebt*) since 1996 also has a positive effect on expectations of lower government support of 2.85 percent is somewhat surprising. The farm operator is likely increasing debt in the operation because he/she realizes a reduction in future government support will reduce future available credit, so the operator needs to borrow the money today while credit is available. Furthermore, since increasing farm acreage is generally done through debt financing, it is not surprising that those operations expecting government payments to decline would have more debt since 1996. Results in Table 4 indicate that an additional management strategy (*totmgmt*) employed by the operator increases the probability of expecting lower government support by 0.83 percent. The notion here is that as the farm operator is increasing the total number of management strategies to make farm income less risky, the need to add additional strategies becomes more important in the face of declining government support.

When examining the marginals for the farm type indicators, positive statistical significance was only found for one of the farm types corn (*corn*) relative to the reference farm type (farms producing either tobacco, peanuts, fruits, vegetables, and/or tree nuts). The likelihood of expecting lower government support for a corn farm type is 4.95 percent. High value crops (*hvc*) farm types, however, exhibit negative statistical significance relative to reference farm type. Perhaps these farmers feel that the government is likely to begin providing support for certified organic farm operations and other similar initiatives (Dimitri & Greene, 2007). Moreover, since this farm type has historically received very few if any government payments, it would be difficult to lower the government support to a level less than zero.

Summary and Conclusions

Our research analyzed the expectations of farm operators on government support. Specifically, we examined the following two questions from the 2001 ARMS: 1) "Do you expect government support regardless of price developments during the next four years (*yes or no*)?"; and 2) "Do you expect to receive about the same level of government support for this operation during the next four years (*yes/expect more; no, expect less; or unsure*)?" Results of this research show that that the factors influencing farmers' expectations of farm policy and government payments using 2001 ARMS conform to a majority of expectations. Operators of farm types (cash grains, wheat, corn, soybean, cotton, other field crops, and dairy) which have historically received government payments have a higher probability of expecting that there will be government support irrespective of price developments and that support will either increase or remain the same, relative to operators of high-value crop farm types (those farm types which have not typically received government payments).

It appears that personal history plays a significant factor in shaping expectations of both government support and the level of support. History is captured by the following variables age squared (*agesq*), if the farmer keeps records (*record*), and if they were raised on a farm (*farmraised*). Each of these variables provides historical context on which the farm operators base their expectations of government support.

This research also provides valuable insight into the relationship between farm policy expectations and off-farm income and management strategies used by farm operators. It is probable that farmers and their families rely on off-farm income more if they feel that government support is apt to decline. Moreover, farm families utilize management strategies for a variety of reasons. Those who feel that government support will continue and that the level will likely increase or remain the same, realize that by employing additional

management strategies, will let them expand the farm operation with minimum risk. However, those operators who feel that government support will decline probably use these same strategies as a means of survival as opposed to expansion.

One of the most interesting results is associated with the use of more debt since 1996, which has a positive effect on the expectations of lower government support. We have provided anecdotal evidence on why this might be occurring. Future agrifinance and agricultural policy research could delve into the motivation of using additional debt today, if you expect government payments decline in the future. Extensions of this research could include studies on land valuations. For example, if cash grain farmers expect payments to persist regardless of price developments these results is a more stable forecasted cash flow, *ceteris paribus*. More stable expected cash flows imply that land prices for cash grains will remain more stable in the face of changing government policy. Future research could also seek to identify the differences in motivation for using management strategies when operators have opposite expectations on government support.

Endnotes

[1] For additional discussion on the formation of U.S. farm policy see Gardner (2002), Schertz and Doering (1999), and Orden et. al. (2009).

[2] Cash grains include oats, barley, and/or other grain crops not otherwise classified. Livestock includes beef cattle, hogs, poultry, and dairy.

[3] McFadden pseudo-R_2, which is suggested by McFadden (1973, p. 122), can be applied to any model estimated by maximum likelihood methods as in the cases of the Probit and MNP regression models discussed above. As defined, it is a scalar measure which varies between 0 and 1 and is computed as follows:

$$psuedo - R^2 = 1 - \left[\frac{lnL_A}{lnL_O}\right]$$

where lnL_A is the value of the log-likelihood function when all the regressors are included in the estimation and lnL_0 is the value of the log-likelihood function when regression is performed on the intercept only. This R^2 will take the value 0 (indicating poor fit) if the model predicted occurrence of the event no better than a simple flip of a coin, and will equal to 1 if the model predicts the event perfectly (see Amemiya, p. 1505; Maddala, p. 39). A rule of thumb among practitioners is that the regression model is deemed to have excellent predictive power if the computed value of McFadden pseudo-R^2 falls between 0.20 and 0.40.

References

Amemiya, T. "Qualitative Response Models: A Survey." *Journal of Economic Literature*. Vol. 19, no 4(1981):1483-1536.

Ahearn, M. C., H. El-Osta, and J. Dewbre. "The Impact of Coupled and Decoupled Government Subsidies on Off-Farm Labor Participation of U.S. Farm Operators." *American Journal of Agricultural Economics*. Vol. 88, no 2(2006): 393-408.

Banker, D., R. Green, and R. Hoppe. SAS FORMATS for Labeling ARMS Phase 3 and FCRS Classification Variables. Washington DC: U.S. Department of Agriculture, Economic Research Service. 2006.

Barnard, C., R. Nehring, J. Ryan, R. Collender, and B. Quinby. "Higher Cropland Value from Farm Program Payments: Who Gains?" Washington DC: U.S. Department of Agriculture, Economic Research Service, Agricultural Outlook, No. AGO-286, October/November 2001:26-30.

Bhaskar, A. and J. C. Beghin. "Decoupled Farm Payments and the Role of Base Acreage and Yield Updating under Uncertainty." *SSRN*, Available at: http://ssrn.com/abstract=1274067, September 26, 2008.

Bhaskar, A. and J. C. Beghin. "How Coupled Are Decoupled Payments? A Review of the Evidence." *Journal of Agricultural and Resource Economics*, Vol. 34, no. 1(2009). 13-153.

Burfisher, M .E. and J. Hopkins. "Decoupled Payments: Household Income Transfers in Contemporary U.S. Agriculture." Washington DC: U.S. Department of Agriculture, Economic Research Service, Agricultural Economic Report No. 822, February 2003.

Coble, K. H., J. C. Miller, and M. D. Hudson. "Decoupled Farm Payments and Expectations for Base Updating." *Applied Economic Perspectives and Policy*, Vol. 30, No. 1(2008): 27-42

Coble, K. H., T. O. Knight, G. F. Patrick, and A. E. Baquet. "Understanding the Economic Factors Influencing Farm Policy Preferences." *Review of Agricultural Economics*. Vol. 24, no. 2(2002):309-321.

Detre, J. D., M. A. Gunderson, and B. C. Briggeman. "Identifying Abnormal Returns to Food and Agribusiness Stocks on Key Farm Policy Legislative Dates." *Journal of Agribusiness*, Vol. 26, no. 1(2008): 21-39.

Dimitri, C. and C. Greene. "Recent Growth Patterns in the U.S. Organic Foods Market." *Organic Agriculture in the U.S.* Editor A. J. Wellson. Publisher NOVA. 2007:129-190.

Edelman, M. A. and P. Lasley. "An Analysis of the Agricultural and Trade Policy Preferences of Iowa Farm Operators." *North Central Journal of Agricultural Economics*. Vol. 10, no. 2(1988): 243-254.

Edwards, C., and T. DeHaven, "Farm Subsidies at Record Levels as Congress Considers New Farm Bill." Cato Institute, Cato Briefing Paper No. 70, October 2001.

Ellison, B. D., J. L. Lusk, and B. C. Briggeman. "Taxpayer Beliefs about Farm Income and Preferences for Farm Policy." Applied Economic Perspectives, Vol. 32, no. 2(2010): 338-354.

El-Osta, S. H., A. K. Mishra, and M. J. Morehart. "Off-farm labor Allocation Decisions of Married Farm Couples and the Role of Government Payments." *Review of Agricultural Economics*, Vol. 30, no 2(2008)311-332.

Featherstone, A. M., C. B. Moss, T. G. Baker, and P. V. Preckel. "The Theoretical Effects of Farm Policies on Optimal Leverage and the Probability of Equity Losses." *American Journal of Agricultural Economics*. Vol. 70, no. 3(1988):572-579.

Findeis, J. L. "Subjective Equilibrium Theory of the Farm Household: Theory Revisited and New Directions," Workshop on the Farm Household-Firm Unit: Its Importance in Agriculture and Implications for Statistics, Wye Campus, Imperial College 15723, International Agricultural Policy Reform and Adjustment Project, April 12-13, 2002.

Forbes, S. (Chairman). Recommendations of the Farm Financial Standards Task Force: Financial Guidelines for Agricultural Producers. Financial Accounting Standards Board, Norwalk, Connecticut, 1991.

Gardner, B. L. "Agricultural policy: Pre- and post-FAIR comparisons." In L.Tweeten and S. R. Thompson (eds.), Agricultural Policy for the Twenty-First Century. Ames, IA: Iowa State University Press, 2002

Gardner, B. L. "Causes of U.S. Farm Commodity Programs." *Journal of Political Economics*. Vol. 95, no. 2(1987):290-310.

Goodwin. B. K. "An Empirical Analysis of the Demand for Multiple Peril Crop Insurance." *American Journal of Agricultural Economics*. Vol. 75, no. 2(1993):425-434.

Goodwin, B. K., and T. C. Schroeder. "Human Capital, Producer Education Programs, and the Adoption of Forward-Pricing Methods." *American Journal of Agricultural Economics*. Vol. 76, no. 4(1994):936-947.

Goodwin, B. K., and A. M. Featherstone. "An Empirical Analysis of Participation in US Government Farm Programs." *Applied Economics*. Vol. 27, no. 1(1995):39-50.

Goodwin, B. K., A. K. Mishra, and F. Ortalo-Magne. "What's Wrong With Our Models of Agricultural Land Values?" *American Journal of Agricultural Economics*. Vol. 85, no. 3(2003):744-752.

Hensher, D. A., and L. W. Johnson. *Applied Discrete-Choice Modeling*. New York: Wiley. 1981.

Jurenas, R. "Peanut Program: Evolution from Supply Management to Market Orientation." *CRS Report for Congress*. August 8, 2002.

Lence, S. H., and D. J. Hayes. "U.S. Farm Policy and the Volatility of Commodity Prices and Farm Revenues." *American Journal of Agricultural Economics*. Vol.84, no. 2(2002): 335-351.

Maddala, G. S. "Limited-Dependent and Qualitative Variables in Econometrics." UK: Cambridge University Press, 1983.

May, D. E. "Agricultural Trade Liberalization Under Bilateralism: An International Network Perspective." *Portuguese Economic Journal*, Vol. 1, no.10 (2011):23–34

McFadden, D. "Conditional Logit Analysis of Qualitative Choice Behavior." Frontiers in Econometrics, P. Zarembka, ed., New York: Academic Press, 1973.

Mishra, A. K., and B. K. Goodwin. "Farm Income Variability and the Supply of Off-farm Labor." *American Journal of Agricultural Economics*. Vol. 79, no. 3(1997):880-87.

Mishra, A.K., H. S. El-Osta, M. J. Morehart, J. D. Johnson, and J. W. Hopkins. "Farm Sector Performance and Well-Being of Farm Households." Washington DC: U.S. Department of Agriculture, Economic Research Service, Agricultural Economic Report No. 812, July 2002

Mishra, A. K., and H. S. El-Osta. "Effect of Agricultural Policy on succession Decisions of Farm Households." *Review of Economic Households*. Vol. 6, no. 3(2008):285-307.

Monke, J. "Farm Commodity Policy: Programs and Issues for Congress." *CRS Report for Congress*. March 15, 2005.

Orden, D., D. Blanford, and T. E. Joling. "Determinants of Farm Policies in the United States, 1996-2008." World Bank, Agricultural Distortions Working Paper No. 50297, 2009

Orazem, P. F., D. M. Otto, and M. A. Edelman. "An Analysis of Farmers' Agricultural Policy Preferences." *American Journal of Agricultural Economics*. Vol. 71, no. 4(1989):837-846.

Rathmann, R., A. Szklo, and R. Schaeffer. "Land Use Competition For Production of Food and Liquid Biofuels: An Analysis of the Arguments in the Current Debate." *Renewable Energy*, Vol. 35, no. 1(2010):14-22

Renewable Fuels Association. "From Niche to Nation: Ethanol Industry Outlook 2006." www.ethanolrfa.org/objects/pdf/outlook/outlook_2006.pdf. Accessed January 2008.

Roberts, M. J., and N. Key. "Agricultural Payments and Land Concentration: A Semiparametric Spatial Regression Analysis." *American Journal of Agricultural Economics*. Vol. 90, no. 3(2008):627-643.

Robison, L. J., and P. J. Barry. The Competitive Firm's Response to Risk. London: Collier Macmillan, 1987.

Schertz, L. P. and O. C. Doering. The Making of the 1996 Farm Act. Ames, IA: Iowa State University Press, 1999.

Scrimgeour F. G., and E. C. Pasour, Jr. "A Public Choice Perspective on Agricultural Policy Reform: Implications of the New Zealand Experience." *American Journal of Agricultural Economics*. Vol. 78, no. 2(1996):257-267.

Serra, T., B. K. Goodwin, A. M. Featherstone. "Risk Behavior in the Presence of Government Programs." *Journal of Econometrics*. Vol. 162, no. 1(2011):18-24

U.S. Department of Agriculture, Economic Research Service. Agricultural Resource Management Survey. Washington DC, 2001.

U.S. Department of Agriculture, Economic Research Service. Agricultural Resource Management Survey Interviewer's Manual. Washington DC, 2001.

U.S. Department of Agriculture, Economic Research Service. ERS Farm Income: Data Files. Available at http://www.ers.usda.gov/data/farmincome/FinfidmuXls.htm. Accessed February 2010.

Westcott, P. C., C. E. Young, and J. M. Price. "The 2002 Farm Act: Provisions and Implications for Commodity Markets." Washington DC: U.S. Department of Agriculture, Economic Research Service, Agriculture Information Bulletin No. 778, February 2002.

Table 1. Government payments by type: 1996-2008 ($1,000)

Year	Production Flexibility Contract Payments	Fixed direct Payments	Counter-cyclical Payments	Loan Deficiency Payments	Mkt. Loan Gains	Certificate Exchange Gains	Peanut Quota Buyout Payments	Milk Income Loss Payments	Tobacco Transition Payments	Cnsv. Programs	Ad hoc and Emergency Programs	Misc. Programs	Total Direct Payments
1996	$5,973,002	na	na	($11)	($158)	na	na	na	na	$1,845,111	$172,538	($650,912)	$7,339,570
1997	$6,119,814	na	na	($58)	($34)	na	na	na	na	$1,739,730	$189,173	($553,331)	$7,495,294
1998	$6,000,580	na	na	$1,782,986	$171,127	na	na	na	na	$1,546,314	$2,884,633	($5,624)	$12,380,016
1999	$5,045,690	na	na	$5,919,071	$895,501	na	na	na	na	$1,568,772	$7,951,397	$132,688	$21,513,119
2000	$5,048,840	na	na	$6,424,544	$1,127,082	$325,088	na	na	na	$1,662,089	$8,623,672	$10,249	$23,221,565
2001	$4,040,449	na	na	$5,464,184	$707,722	$1,703,751	na	na	na	$1,903,437	$8,538,767	$72,937	$22,431,247
2002	$3,499,757	$367,095	$203,398	$1,196,725	$459,739	$1,178,598	$983,003	$859,642	na	$1,965,844	$1,654,969	$46,127	$12,414,897
2003	($280,008)	$6,703,601	$2,300,695	$576,377	$198,183	$556,367	$237,642	$913,317	na	$2,167,302	$3,143,243	$6,773	$16,523,492
2004	($4,241)	$5,242,375	$1,121,986	$2,865,142	$131,183	$475,706	$24,727	$205,677	na	$2,319,562	$582,353	$5,403	$12,969,872
2005	($934)	$5,198,765	$4,073,827	$5,080,301	$368,718	$1,614,026	$22,278	$9,587	$2,083,060	$2,767,464	$3,168,842	$9,918	$24,395,851
2006	na	$5,051,952	$4,035,776	$730,478	$188,246	$873,260	$21,161	$431,231	$1,206,340	$2,974,475	$274,507	$1,667	$15,788,844
2007	na	$5,059,656	$1,124,937	$54,471	$271,851	$818,433	na	$73,901	$901,244	$3,072,090	$527,940	($1,281)	$11,903,243
2008	na	$5,110,365	$712,080	$84,787	$29,665	$202,024	na	($275)	$816,347	$3,155,843	$2,121,418	$5,316	$12,237,568

Source: USDA, ERS

Table 2. Variable description

Variable	Variable description	Mean	Std. Dev	Min.	Max.
op_age	Age of operator, years	55.44	37.92	20	102
agesq	Age squared of operator	3073.31	1437.68	400.00	10404.00
educ	Education of operator, years	13.12	1.88	10.00	16.00
male	Operator gender (=1 if male; 0 if female)	94.61%	22.58%	0.00%	100.00%
entropy	Diversification measure	0.02	0.05	0.00	0.50
tenant	Operator is tenant (=1 if tenant; 0 otherwise)	12.39%	32.95%	0.00%	100.00%
powner	Operator is part owner (=1 if part owner; 0 otherwise)	48.17%	49.97%	0.00%	100.00%
debtasst	Debt to asset ratio (debt/assets)	17.54%	109.24%	0.00%	7519.58%
record	Farm keeps records (=1 if yes; 0 otherwise)	46.57%	49.89%	0.00%	100.00%
farmraised	Operator raised on farm (=1 if yes; 0 otherwise)	80.97%	39.26%	0.00%	100.00%
moreacres	Farm has increased acres since 1996 (=1 if yes; 0 otherwise)	30.30%	45.96%	0.00%	100.00%
moredebt	Farm has increased debt since 1996 (=1 if yes; 0 otherwise)	29.27%	45.50%	0.00%	100.00%
adjwage_op	Operator off-farm wage, dollars	$13,480	$45,233	$0	$1,000,000
adjwage_sp	Spouse off-farm wage, dollars	$10,395	$20,934	$0	$750,000
totmgmt	Count of management strategies	1.57	1.55	0.00	9.00
product	Farm uses production contracts (=1 if yes; 0 otherwise)	10.30%	30.39%	0.00%	100.00%
market	Farms uses marketing contracts (=1 if yes; 0 otherwise)	22.34%	41.66%	0.00%	100.00%
cg	Greater than 50% of farm revenue from cash grains	7.41%	26.19%	0.00%	100.00%
wheat	Greater than 50% of farm revenue from wheat	3.59%	18.59%	0.00%	100.00%
corn	Greater than 50% of farm revenue from corn	4.67%	21.10%	0.00%	100.00%
soybean	Greater than 50% of farm revenue from soybeans	3.05%	17.20%	0.00%	100.00%
cotton	Greater than 50% of farm revenue from cotton	3.27%	17.79%	0.00%	100.00%
ofc	Greater than 50% of farm revenue from other field crops	12.01%	32.51%	0.00%	100.00%
hvc	Greater than 50% of farm revenue from high value crops (nursery and greenhouse)	4.69%	21.14%	0.00%	100.00%
dairy	Greater than 50% of from revenue from dairy cattle	8.60%	28.05%	0.00%	100.00%
genlvstk	Greater than 50% of farm revenue from livestock (beef cattle, hogs, poultry, and general livestock)	43.32%	49.56%	0.00%	100.00%

Number of Observations: 5103
The reference group consists of farms that have greater than 50% of farm revenue from tobacco, peanuts, fruits, vegetables, and/or tree nuts

Table 3. Coefficients and marginal effects for the following question, "Do you expect government support regardless of price developments during the next four years?"

Variables	Coefficients	Predicted Marginal Effects
op_age	-0.0093	-0.0034
agesq	0.0002*	0.0001*
educ	0.0227**	0.0082**
male	0.2779***	0.0935***
entropy	-0.4501	-0.1619
tenant	0.2299***	0.0855***
powner	0.3658***	0.1312***
debtasst	-0.013	-0.0047
record	0.2598***	0.0936***
farmraised	0.3328***	0.113***
moreacres	0.0572	0.0207
moredebt	0.145***	0.0528***
adjwage_op	-0.0001**	-0.0001**
adjwage_sp	-0.0001	-0.0001
totmgmt	0.0903***	0.0325***
product	0.0321	0.0116
market	0.0869	0.0316
cg	1.185***	0.4461***
wheat	1.2973***	0.479***
corn	1.0572***	0.4029***
soybean	1.272***	0.4713***
cotton	1.294***	0.4779***
ofc	0.5902***	0.2262***
hvc	-1.181***	-0.2867***
dairy	0.1991**	0.074**
genlvstk	0.0055	0.002
_cons	-2.1058***	-0.0034
Number of observations: 5103		
Wald $\chi2(25)$: 1228.7069		
Probability > $\chi2$: 0.0000		
Log pseudo likelihood:-2579.9925		
Pseudo R^2: 0.2268		

* Significant at 10%; ** significant at 5%; ***significant at 1%

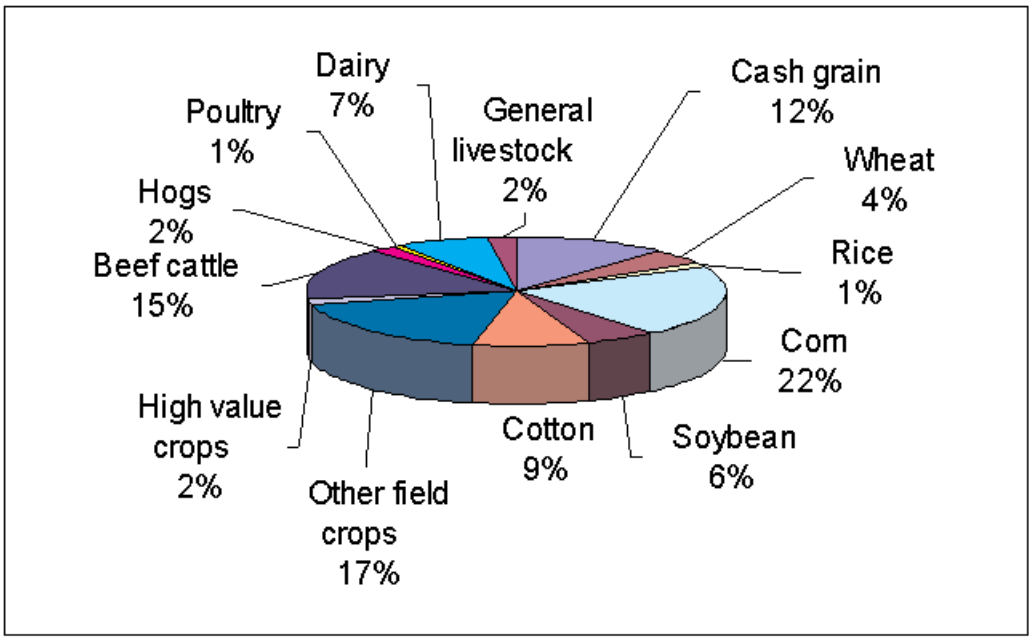
Table 4. Coefficients and marginal effects for the following question, "Do you expect to receive about the same level of government support for this operation during the next four years?"

	Government Support Level Increases or Stays the Same		Government Support Level Declines	
Variables	**Coefficient**	**Predicted Marginal Effects**	**Coefficient**	**Predicted Marginal Effects**
op_age	-0.0036	-0.0007	-0.0037	-0.0004
agesq	0.0001	0.0001	0.0001	0.0001
educ	0.028*	0.0038	0.058***	0.0072***
male	0.3141**	0.0596**	0.2692	0.023
entropy	-0.6002	-0.1089	-0.716	-0.075
tenant	0.3399***	0.0729***	0.243**	0.0179
powner	0.4348***	0.0774***	0.5397***	0.0575***
debtasst	-0.0307*	-0.001	-0.1259	-0.0171
record	0.1172*	0.017	0.2223***	0.027***
farmraised	0.339***	0.0615***	0.3776***	0.0362***
moreacres	0.1914***	0.0497***	-0.0457	-0.0166
moredebt	0.2118***	0.038**	0.2612***	0.0285**
adjwage_op	-0.0001**	-0.0001*	-0.0001	-0.0001
adjwage_sp	-0.0001	-0.0001	0.0001*	0.0001**
totmgmt	0.1135***	0.0227***	0.0952***	0.0083**
product	0.0796	0.0185	0.0227	-0.0009
market	0.0708	0.0137	0.0698	0.0068
cg	1.325***	0.3089***	0.848***	0.038
wheat	1.4117***	0.3505***	0.7046***	0.0038
corn	1.3374***	0.3052***	0.9272***	0.0495*
soybean	1.2305***	0.2975***	0.6984***	0.0198
cotton	1.1865***	0.2885***	0.6525***	0.0165
ofc	0.8123***	0.2045***	0.2583*	-0.011
hvc	-1.828***	-0.2382***	-1.4762***	-0.0949***
dairy	0.3005**	0.0563*	0.337**	0.0364
genlvstk	-0.0477	-0.0015	-0.1978	-0.0266
_cons	-2.6574***		-3.3057***	

Number of observations: 5103
Wald $\chi 2(50)$: 1040.1966
Probability > $\chi 2$: 0.0000
Log pseudo likelihood = -4043.312

* Significant at 10%; ** significant at 5%; ***significant at 1%

Figure 1. Government payments by crop



Source: 2006 USDA Agricultural Resource Management Survey