

# **UKCPR**

## **UK Center for Poverty Research**

UKCPR Discussion Paper Series  
#2004-02

2004

### **Prospects of Agricultural Entrepreneurship Among Resource Limited Farmers In the Central Appalachian Tobacco Belt**

M'Kiara Kimathi Miriti  
Eric Scorsone  
University of Kentucky

The opinions and conclusions expressed herein are solely those of the author and should not be construed as representing the opinions or policy of the UK Center for Poverty Research or any agency of the Federal government.

**Prospects of Agricultural Entrepreneurship Among Resource Limited Farmers  
In the Central Appalachian Tobacco Belt**

By

M'Kiara Kimathi Miriti<sup>1</sup> and Eric Scorsone<sup>2</sup>

---

<sup>1</sup> Post Doctoral Research Associate, Agricultural Economics, University of Kentucky

<sup>2</sup> Assistant Professor UK Agricultural Economics, Faculty Associate UK Poverty Research Center

## **Abstract**

Agricultural entrepreneurship is receiving heightened attention as a potential means for economic revitalization of communities adversely affected by changes in the agricultural sector. In particular, resource limited farmers in the Appalachian region of the United States have been hit by major changes in the tobacco industry. Very little is known about resource limited farmers respond to changing industry conditions and policy attempts to remedy structural change. Recently, the Commonwealth of Kentucky has attempted to assist farmers in adopting new farm-based enterprises to expand their income base. However, it is unclear about the factors that drive entrepreneurial or diversification activities among resource limited farmers. In general, it is expected that resource limited farmers, most of whom work off-farm for a significant portion of their income, face a tradeoff between off-farm work constraints and potential new sources of income on-farm. This paper uses a survey of 765 farmers in Northeast Kentucky to explore factors correlating with agricultural entrepreneurship and understanding this tradeoff.

## **Introduction**

Changing global market conditions continue to expose poor and economically distressed agricultural communities to an increasing risk of further impoverishment. In particular, tobacco dependent counties of the central Appalachian region of the United States, many of which are already classified as distressed due to exceptional economic hardships, are increasingly endangered by a continuing restructuring of the tobacco economy.

Changing tastes and preferences among tobacco consumers in the US, and advancement in production technology overseas, have imparted an alarming downward pressure on domestic tobacco prices. This pressure has translated to a downward pressure on tobacco quota under the federal tobacco program. Tobacco quota is the maximum amount of tobacco that farmers can sell within a marketing year as dictated by the federal tobacco program. The federal tobacco program, which is designed to protect producer incomes, responds to decreasing tobacco prices by reducing tobacco quota so as to put a price floor. Due to a sustained decline in demand, however, the federal tobacco program is incapable of protecting producer incomes. The program was designed to protect producer incomes against adverse random price movements. By law ,it cannot be funded with resources outside the tobacco industry. The program is therefore not capable of protecting producer incomes from persistent and systematic price declines. Consequently, scrapping this program has been placed top on the policy debate as policy makers (and farmers) reckon that the program cannot meet its objects within the new environment (Capehart, Jr., 2003).

While the changing tobacco market is a concern for the general US economy, certain regions of the US are particularly affected. The Commonwealth of Kentucky, being the most tobacco-dependent state of the US, is particularly vulnerable to adverse changes in the tobacco

economy. It has been estimated that every \$1 million of tobacco production contributes \$3.6 million to the state's economy through overall multiplier effects (Snell, 1996). Within the state, certain counties are more vulnerable than others. According to a USDA report 17 of the 20 most tobacco dependent counties in the US are in Kentucky (NASS, 2001). Most of these counties are in the Appalachian region.

There are many reasons why the Appalachian region is particularly vulnerable to the annulment of the tobacco program. First, due to the small size of tobacco farms in Appalachia, withdrawal of producer protection would lead to a displacement of Appalachian producers by larger farms which can compete more favorably in a free market due to lower costs of production. Second, farm losses in the Appalachian region would be exacerbated by unemployment because tobacco farms are a major employer of family labor in the region (Wood, 1998). Third, much of the Appalachian region is already economically distressed.

### *Agricultural Entrepreneurship Considered*

In the last ten years literature has emerged arguing that the farm sector ought to be recognized as an important domain of small businesses in the rural sector, and that research in small business should extend its focus to incorporate agriculture. Carter (1996) argues that the farm sector is likely to offer small business researchers a unique opportunity to analyze issues at the center of small business debate, and moreover, that small business research ought to capture the nature of the relationship between the dynamics of agricultural restructuring and the emergence of new businesses in rural areas. As consumer demands change and agricultural programs disintegrate, agriculture becomes a supplier of entrepreneurs and business managers not just outside agriculture but also within it as some farmers venture into new agricultural

enterprises due to a change in the operating environment. In the US, as tobacco quotas and prices decline, income reduction is pushing farmers into exploring new strategies to generate alternative sources of cash. The final blow will be dealt by the expected eradication of the tobacco program, when tobacco production will be exposed to forces of the market leading to the displacement of high cost traditional producers. Those who are displaced will have to reorganize their farm portfolio, or exit the farm sector.

When commodity markets decline, farm operators must choose between scaling up their farm activity, exiting farming and seeking off-farm employment, or restructuring their farm portfolios by substituting new farm and off-farm enterprises for nonperforming traditional enterprises (Bowler et al, 1996). Yet not all options are equally available to all communities. Depending on economic circumstances, none of the options may be readily available to some communities. Nationwide a satisfactory farm based tobacco substitute is hard to come by because the unique success of the federal tobacco program in protecting producer incomes could not arise without building producer margins that are difficult to realize in alternative farm enterprises. In Appalachia, where off-farm employment is scarce because of a limited industrial base, the situation is more desperate. With an average unemployment rate of 5.6 percent in Appalachian Kentucky and a low labor force participation rate (ARC, 2002), there is pressure on farmers who wish to seek off-farm employment. At the same time, it is estimated that nearly 70 percent of Appalachian farmers work off-farm to raise income at least part of the year (Somov, 2002).

Analysts started as early as the early 1990s to recognize the fact that sustaining the tobacco program could be difficult given the hostility of the economic environment. Thus pursuance of farm diversification efforts was suggested as a means to hedge against the worst

case scenario (Childress, 1994). Policy makers who have been faced with similar challenges in the past (e.g. in New Zealand during the privatization of the livestock industry in the final two decades of the twentieth century) concluded that when public involvement in the farm sector is withdrawn efforts to cope with the changing economy will most likely be fruitful when they focus at the reorganization of the farm sector (New Zealand Ministry of Agriculture and Forestry). In the same vain many public programs in the United States are investing millions of dollars to support agricultural entrepreneurship programs. In Kentucky, 50 percent of the tobacco settlement money has been designated to agricultural diversification efforts.

Understanding the propensity of, and factors for, farm diversification is rapidly becoming an interesting area of inquiry. Little is known about the factors that make some communities or specific households more likely to engage in agricultural diversification and adoption of new farm enterprises. This perhaps owes to the fact that research in entrepreneurship has traditionally neglected the primary sector (Carter, 1996).

There are several key challenges of implementing entrepreneurship as a development strategy in Central Appalachia. Most importantly, it is not certain how quickly farmers can accept that traditionally generous enterprises may no longer be economically reliable, and that the latter may need to be substituted with second bests. Data has shown that tobacco farmers in Kentucky and North Carolina have historically reaped 10 to 20 times the returns to an acre of land that they would receive if they cultivated other popular crops, such as double crop wheat and beans, or corn (Snell and Goetz, 1997 and Capehart, Jr., 2003). These returns have also been accompanied by low risk owing to the governmental tobacco program. Secondly, resource limited tobacco farmers often work off-farm along with family members. Off-farm employment is likely to have a large impact on any response to policies encouraging agricultural

diversification. Off-farm employment has a two-edged effect on farmer diversification; at once providing additional resources for new ventures while at the same time reducing the time available for implementing these new ventures. Other factors, including the number of years in operation, household attachment to the farm, levels of education and skill training as well as the ease to secure off farm employment, may also influence the likelihood that a farmer will consider new agricultural ventures. These are some of the hypotheses being examined in this study.

### *Research Question and Hypotheses*

Several factors influence the nature of the research hypothesis in this study. The hypothesis in this study is derived from a theory of on-farm diversification versus off-farm employment. There is a conceptual tradeoff between earning income off-farm and diversifying on-farm operations. The farm household has to assess the tradeoff in opportunity costs from these two options. Time off-farm reduces the household's ability to conduct on-farm activities. Of course, alternative enterprises, e.g. beef versus dairy cows, will have different time and other input requirements. Moreover, the choice to diversify on-farm activities, given a current farm commitment, such as a tobacco enterprise, is a conditional choice.

Given all of these factors, several research hypotheses emerge in this study. It is hypothesized that time spend off-farm working will reduce the likelihood of a farm being entrepreneurial. Further, it is hypothesized that households engaged in tobacco production, or who raise a major share of their income from tobacco, are more likely entrepreneurial in the wake of a changing tobacco market. Rejection of this hypothesis may suggest a mix of several factors. One, tobacco farmers may not have appreciated the permanent nature of the current revolution of the tobacco sector. Second, farmers may be so accustomed to uncompetitive

tobacco premiums that their entrepreneurialism has been compromised. Third, asset fixity owing to the specialization of tobacco equipment could be a hindrance to moving out of tobacco and into alternative enterprises.

### **Data and Methods**

Data is from a recent survey administered by the Kentucky Entrepreneurial Coaches Institute at the University of Kentucky. Questionnaires were sent to 2,500 farmers of Northeastern Kentucky in January 2004. A total of 810 questionnaires were returned, representing a response rate of 32 percent. Of these, 765 completed questionnaires were deemed useful for the study. Descriptive statistics of the data are summarized in Table 2. Detailed description of the data is presented in the Appendix.

The sample frame is composed of farm households from 19 contiguous and highly tobacco-dependent counties of Northeastern Kentucky. The state is investing heavily in a program to foster farm entrepreneurship in the region covered by these counties. Part of the objective of this study is to provide a baseline level of data on agricultural entrepreneurship for that program.

A mail-based survey was conducted using a mailing list derived from records maintained by county extension offices in the target region. Each extension office in the region (one per county) was asked to submit its official farm household mailing list. County offices derive their lists from the Farm Service Agency, an affiliate of the United States Department of Agriculture. Any farmer who participates in a government commodity support program or emergency relief program must sign up through this database.

Clearly, a potential selection bias is inherent in the sample frame of the study because not all farmers participate in government farm programs. Some farmers may never seek to participate, while others, particularly those who only grow nontraditional crops, may not qualify to participate. Regardless of this potential problem, this list was the best alternative available for defining a sample frame.

The questionnaire sought information on several factors that were presumed likely to correlate with farm entrepreneurship. These factors include the years of operation under current management, the level of education and age of the operator, hours of work on farm and off farm by the operator and the spouse, whether there was a tobacco crop on the farm in the previous year, the operator's farm background, whether farming is the primary occupation, the main motivation to farm, participation in various training or educational development activities in the previous year. These variables are described in Table 1.

**Table 1: Variables**

<b>Variable</b>	<b>Variable Description</b>
YES	Response to the question: “Did you start any new farm activity in the last five years?” YES = 1 if response is ‘Yes’, and 0 otherwise.
Educn	Categorical variable for the operator’s level of formal education: 0 for none, including none-response 1 for up to middle school 2 for at least some high school or GED 3 for up to college, with no diploma 4 for technical or vocational certificate, or associate’s degree 5 for bachelor’s degree or higher
farmBG	Response to the question: “Do you come from a farming background?” 1 if ‘Yes’, 0 otherwise
BusType	The legal form of business. 0 for sole proprietorship including family corporation and none response 1 for partnerships and corporations.
Oper_Hrs and Spse_Hrs	Respectively, Operator’s and Spouse’s average weekly hours of work on farm during the last 5 years 0 for below 10 or non response, 1 for between 10 and 29, 2 for at least 30.
OffHrsOpr and OffHrsSps	Respectively, Operator’s and Spouse’s average weekly hours of work off farm during the last 5 years 0 for below 10 or non response, 1 for between 10 and 29, 2 for at least 30.
offfarmexp	Type of off farm experience 0 for Professional and Executive 1 for Sales and Support 2 for Production, Transport, labor, service and machine operators 3 for other specialized experience
Whyfarm	Response to the question: ‘Why mainly do you farm?’ 0 for: farming is a way of life, a good family way, I enjoy farming, and none response. 1 for: to make extra income, or for tax benefits 2 for: faming is easier than other occupations, the only employment I could secure, only experience I have
Tobacco	A categorical variable for presence of a tobacco crop on farm in the previous year; 1 for present, 0 for absent (including none response).
YrsOprate	Years of farm operation under the current operator: 0 if 3, 1 if between 3 and 8 and 2 if over 8.
SkillSpend	Type of skill advancement activity participated in during the past year 0 of none or non response 1 for conference, seminar or tradeshow 2 for extra training, next level training, workshop, or other training.
Age	Age of operator

## **Basic Data Exploration**

### *Importance of Tobacco in the Household Budget*

The data underscores the importance of tobacco in household budgets in the study region. This is evident in Table 6 in the Appendix. 321 respondents (42 percent) indicate that tobacco is responsible for at least 20 percent of household income, with half of these attributing more than half of household income to tobacco. Among the respondents attributing over 50 percent of their annual income to tobacco are 9 respondents who did not grow any tobacco. These received their tobacco incomes by way of leasing quota allotment. Moreover, since the question whether any income arose from leasing tobacco quota allotment was not explicitly asked, the number of respondents who offered this information is very likely an under representation of households that made tobacco income by this means. For 339 respondents, there was no indication that tobacco had been grown in the previous year.

The descriptive statistics (Table 2) may provide a basic sense of the distribution of responses. For example, a mean of 2.82 for the variable Educn may be interpreted to mean that the typical respondent had at least some high school or GED, and up to college with no diploma. It should be noted, however, that a few respondents with education at higher levels can pull this statistic up significantly, and thus the term ‘typical respondent’ in this usage is abstract.

**Table 2: Descriptive Statistics (N = 765)**

Variable	Mean	Standard Deviation	Minimum	Maximum
YES	0.20	0.40	0	1
Educn	2.82	1.28	0	5
farmBG	0.94	0.24	0	1
BusType	0.31	0.46	0	1
Oper_Hrs	1.15	0.79	0	2
Spse_Hrs	0.34	0.62	0	2
OffHrsOpr	0.95	0.95	0	2
OffHrsSps	0.85	0.94	0	2
Offfarmexp	1.68	0.98	0	3
Whyfarm	1.04	0.86	0	2
Tobacco	0.68	0.47	0	1
YrsOprate	1.78	0.52	0	2
SkillSpend	0.95	0.97	0	2
Age	56.5	13.73	22	92

### *Household attachment to the farm*

A question was asked that would capture monetary and non-monetary incentives to farm, including skill and labor market constraints. In particular, respondents were asked to indicate motivations to farm by ticking all applicable choices from a range of eight options. These options included: farming is the way of life, farming is a good family way, farming is enjoyable, farming is less stressful, to supplement off farm income, to receive tax benefits, no other employment could be secured, and farming is the only area of experience. An overwhelming majority of respondents indicated non-monetary motivations to farm. These responses are summarized in Table 7 in the Appendix. Non-monetary motivations included values in farming as a way of life or of raising family, and as a hobby. It is not certain to what extent these

motivations would remain intact when farm economic returns deteriorate. Presumably, however, farmers who are influenced more by these motivations would be slower than others in responding to monetary farm signals. When they respond to monetary signals arising from specific farm enterprises they are more likely than other farmers to adopt new farm enterprises than to substitute non-farm for farm activities. Non-monetary motivations also included skill and labor market constraints, encompassing the inability to find off farm employment and lack of alternative skills. Farmers of this set of motivations are more vulnerable to farm restructuring forces due to limited options off farm.

#### *Hours Worked On- and Off-Farm*

As specified earlier, a critical factor in diversification or entrepreneurial behavior is based on time constraints of working on- and off- the farm. According to recent reports, some farmers' spend 30 or more hours working off-farm on a regular basis. Under these conditions, it becomes increasingly unlikely that these farmers will be able to spend any significant amount of time engaging in new farm enterprises. At the same time, off-farm employment provides both a source of income and stability, including potentially health insurance that may induce more entrepreneurial behavior. Furthermore, a spouse may work off-farm which provides additional compensation and benefits without the time restrictions.

Based on results from the survey, farm operators in northeast Kentucky spent roughly between 10 and 29 hours working off-farm on average. Based on these findings, farm operators would appear to have chosen a mixed portfolio of on-farm and off-farm activities. At the same time, spouses also worked off-farm at roughly the same proportion of hours (10 to 29 hours). It thus appears that both farm operator and spouse spend part of their week off-farm and part of the

week on-farm. These descriptive statistics point to the possibility that some time remains for farm operators to switch or diversify on-farm operations. For purposes of the statistical model, it is expected that as off-farm employment time becomes more prevalent there will be a decline in the likelihood of a farm operator engaging in entrepreneurial activities holding other factors constant.

#### *Years in Operation and Skill Development*

Several other variables were of interest related to skills and human capital development and number of years of farm operation. It is expected that farmers who have been in agricultural production for a longer period of time will have more difficulty in transitioning between old and new enterprises. Because much of the equipment and knowledge of farming is asset or enterprise specific, it may take a considerable time to overcome switching costs. At the same time, newer operators may have an advantage in undertaking investments to engage in new crop or enterprise development. The descriptive statistics indicate that on average most farm operators in the survey had been farming for more than eight years.

Skill development and investments in human capital may point to the potential for a farm operator to find out about new opportunities and how to exploit such opportunities. The descriptive statistics indicate that on average farm operators have attended at least a tradeshow or seminar. It is expected that skill development will positively influence the likelihood of acting in an entrepreneurial fashion.

## **Model Description**

The model was specified as to understand the factors that determined the adoption of new enterprises (i.e. agricultural entrepreneurship) among resource limited farmers in northeast Kentucky. Explanatory factors were primarily focused on the share of tobacco in the household budget and the amount of time spent off-farm farm. There were several other control variables included in the analysis. These control variables included education level, reasons for farming, skill level and years of farm operation. These include an examination of the impact of both off-farm employment and occupational backgrounds of farm operators on the likelihood of agricultural entrepreneurship, as well as the role of various confounding factors.

A logistic model was applied to the data to examine the stipulated hypotheses. Agricultural entrepreneurship is being measured as the adoption of a new crop, livestock or other farm related enterprise in the past five years. It is captured by the discrete dependent variable, YES. YES is equal to 1 if a new venture was initiated on the farm in the last 5 years, and 0 otherwise. The discrete nature of the dependent variable renders the Logistic model an appropriate empirical technique for the estimation of factors related to farm diversification.

## **Model Results**

The logistic model was first run using the STEPWISE regression technique in SAS. This technique is useful in decreasing the number of model specifications in consideration when selecting the final model. Following Shtatland *et al.* (2001), the picking of an optimal model specification was enhanced with an improvisation within the specification of the STEPWISE procedure to allow for a practical minimization of the Akaike Information Criteria (AIC). This

approach removes subjectivity from the model selection criteria given a set of explanatory variables (Shtatland *et al.*, 2001).

Results from two models are presented in Table 3. Model 1 encompasses all the explanatory variables initially considered important in the model while Model 2 entails only the variables that are selected in the STEPWISE regression stage. All variables in Model 2 are statistically significant at the 10 percent level. No parameter estimates are reported in Table 3 because parameter estimates are associated with specific levels of the variables being tested. Parameter estimates for Model 2 are reported in Table 4. The importance of Table 3 is to indicate the variables that are statistically significant in the model. A variable whose probability of Wald  $\chi^2$  is less than 0.1 is statistically significant at the 10 percent level. The significance of individual levels of that variable can be discerned from Table 4.

**Table 3: Logistic Results****Test of hypothesis beta = 0, Dependent Variable = YES,****Number of entrepreneurs = 155, Relative frequency of entrepreneurs = 20.3 percent**

Variable		Model 1 <sup>3</sup>	Model 2 <sup>4</sup>
	DF	Pr > Wald $\chi^2$	Pr > Wald $\chi^2$
SkillSpend	2	0.005	0.0021
YrsOprate	2	0.001	0.0002
Spse_Hrs	2	0.002	0.0016
OffHrsOpr	2	0.148	0.0186
OffHrsSps	2	0.235	---
Oper_Hrs	2	0.016	0.0164
Tobacco	1	0.043	0.0518
EdcnOpr	5	0.065	0.0339
BusType	1	0.375	---
offfarmexp	3	0.774	---
FarmBG	1	0.203	---
WhyFarm	2	0.525	---
Model AIC		706.19	696.242
Model SC		826.826	775.119
- 2 Log L		654.19	662.242
LL Ratio		114.1906 [25]	106.1386 [16 df]
Score		110.7198 [25]	103.0872 [16 df]
Model Wald $\chi^2$		87.976 [25]	83.8178 [16 df]

<sup>3</sup> Full model<sup>4</sup> A refined model of only the variables accepted in the Stepwise regression step

**Table 4: Analysis of Maximum Likelihood Estimates**

Variable	Parameter Estimate	Std Error	Wald $\chi^2$	Pr > Wald $\chi^2$
Intercept	0.370	0.404	0.839	0.3596
SkillSpend 0	-0.738**	0.220	11.273	0.0008
SkillSpend 1	0.085	0.371	0.052	0.8198
YrsOprate 0	0.275	0.460	0.358	0.5495
YrsOprate 1	1.048**	0.256	16.750	<.0001
Spse_Hrs 0	-1.124**	0.331	11.571	0.0007
Spse_Hrs 1	-0.648*	0.359	3.251	0.0714
OffHrsOpr 0	-0.597**	0.237	6.318	0.0119
OffHrsOpr 1	0.125	0.325	0.148	0.7001
Oper_Hrs 0	-0.953**	0.332	8.222	0.0041
Oper_Hrs 1	-0.309	0.240	1.647	0.1993
Tobacco 0	0.404*	0.208	3.781	0.0518
EdcnOpr 0	0.117	0.741	0.025	0.875
EdcnOpr 1	-0.841*	0.508	2.741	0.0978
EdcnOpr 2	-0.579**	0.273	4.503	0.0338
EdcnOpr 3	-0.444	0.287	2.393	0.1219
EdcnOpr 4	0.348	0.351	0.987	0.3206

\*\* indicates variable significance at the 5 percent level.

\* indicates variable significance at the 10 percent level.

Estimates of odds ratio are reported in Table 5 below. An odds ratio for the effect of variable x relative to variable y denotes the factor of change in odds of YES = 1 when variable y is in effect in place of variable x.

**Table 5: Odds Ratio**

Effect	Point Estimate	95% Wald Confidence Limits	
SkillSpend 0 vs 2	0.478	0.311	0.735
SkillSpend 1 vs 2	1.088	0.526	2.252
YrsOprate 0 vs 2	1.317	0.534	3.246
YrsOprate 1 vs 2	2.851	1.726	4.709
Spse_Hrs 0 vs 2	0.325	0.17	0.621
Spse_Hrs 1 vs 2	0.523	0.259	1.058
OffHrsOpr 0 vs 2	0.551	0.346	0.877
OffHrsOpr 1 vs 2	1.133	0.599	2.144
Oper_Hrs 0 vs 2	0.386	0.201	0.74
Oper_Hrs 1 vs 2	0.734	0.458	1.177
Tobacco 0 vs 1	1.497	0.997	2.25
EdcnOpr 0 vs 5	1.124	0.263	4.803
EdcnOpr 1 vs 5	0.431	0.159	1.167
EdcnOpr 2 vs 5	0.56	0.328	0.957
EdcnOpr 3 vs 5	0.642	0.366	1.126
EdcnOpr 4 vs 5	1.417	0.713	2.816

## **Interpretation of Results**

In interpreting the significance of the parameter estimates one must bear in mind that the effects of simultaneous changes in two or more variables may not be estimated by the model. The effect of each variable must be interpreted under the *ceteris paribus* assumption. In other words any statement that a variable  $x$  increases the likelihood of  $YES = 1$  must be understood to also bear the implication 'all else being constant'.

A major hypothesis of this study was that households growing tobacco, or which raise a major share of their income from tobacco, are more likely entrepreneurial in the wake of the unfavorable changes that have afflicted the sector. Greater entrepreneurialism among this group is needed as a means to cushion household incomes from extreme cuts owing to the shrinking tobacco market. Unfortunately, a test at the 90 percent level results to a rejection of the hypothesis. Results indicate that farmers who did not have any tobacco crop in the year preceding the interviews were 50 percent more likely than (or 149.7 percent as likely as) those who had a tobacco crop, to start a new venture.

Farms which were in operation for 3 to 8 years were the most active in diversification. They were almost 2.85 times as likely to start a new venture during the reference period of 5 years preceding the interviews, as those which had been in operation for over 8 years. The parameter estimate relating to the youngest farms (less than 3 years of operation) suggest that these farms are also more entrepreneurial than those which had been in operation for over 8 years, but the parameter is not statistically significant. These findings suggest that farm households who are less committed to traditional farming techniques or have not undertaken asset-specific investments are able to incur lower transition costs.

Neither household attachment to the farm nor the type of off-farm experience had a statistically significant relationship with farm diversification as measured in the study. However off-farm hours of work had a significant influence on farm entrepreneurship. Operators who worked off-farm only up to 10 hours per week were only 55 percent as likely to start a new venture as those who worked off-farm at least 30 hours per week. This finding suggests that primary farm investments depend on resources originating off farm, i.e., those who work mainly on farm may have more limited resources for farm diversification, but at the highest off farm employment levels the time resource can become limiting to farm portfolio adjustment practices. Consistent with this theory, the parameter estimate for off farm hours of work in the middle range (10 to 29) is positive suggesting that these operators tended to be the most active in diversification. However the parameter is not statistically significant. Operators, and their spouses, who worked no more than 10 hours weekly on farm were significantly less likely to start a new venture. This further supports the idea that time is a resource for on-farm diversification.

As expected, farm operators who did not attend any skill-enhancing activity in the year were significantly less likely to start a new farm venture. This finding implies that entrepreneurial farm operators are likely to participate in skill advancement activities as they position themselves for entrepreneurial ventures. In other words a majority of entrepreneurial farmers can be observed in forums for skill advancement prior to entrepreneurial undertakings.

## **Conclusion**

Many rural communities, particularly those classified as being persistent poverty stricken, are searching for new avenues to stimulate economic development. Traditional models emphasizing industrial recruitment seem increasingly difficult given the global nature of the U.S. economy. Low wage jobs are under constant threat of outsourcing and off shoring pressure. A strategy to encourage and stimulate entrepreneurship seems an excellent starting place for a new economic development strategy in rural America.

Most existing rural development strategies focused on entrepreneurship have been targeted to non-agricultural ventures such as telecommunications or tourism. However, the potential for agricultural entrepreneurship remains an important and unique area for rural America to uncover. Very little research has been conducted on the motivations or even proportion of farmers who are attempting new ventures from traditionally established ones. Even if some of these new ventures fail, these statistics could indicate the potential for entrepreneurial growth in a region.

Several recommendations can be suggested in light of the evidence presented in this study. One, a concerted policy effort is needed to accelerate farm entrepreneurship among tobacco farmers. While household incomes among tobacco farmers are dangerously being affected by the ongoing restructuring of the tobacco industry, the study finds that tobacco farmers are less likely than other farmers to adopt new ventures. Two, entrepreneurship development organizations which focus on agriculture can significantly increase the rate of venture adoption when they specifically target farmers who have been in operation for fewer years and are relatively heavily engaged in off-farm employment. Results suggest that this group of farm households is more likely to engage in agricultural diversification activities. This may

be due to the fact that off-farm employment provides additional resources that can be invested in on-farm diversification operations. When entrepreneurship development efforts focus on other categories of farmers, e.g. traditional tobacco farmers, the study suggests that programs to lighten the burden of fixed costs associated with traditional enterprises could be beneficial. Finally, entrepreneurship development organizations are likely to realize the greatest rate of new ventures when they target farmers who participate in skill enhancement activities such as extension training, farm workshops and seminars or trade shows. Efforts targeted at this group of farmers are however unlikely to benefit tobacco farmers.

This study attempted to address important gaps in the entrepreneurship literature with a focus on the primary sector. The study focused on the northeast Kentucky region. Many of the counties in northeast Kentucky are persistently poor or face stagnant local economies, and are threatened by current agricultural restructuring. Whereas a declining tobacco economy and a pending annulment of a federal tobacco program would suggest that tobacco farmers would be searching for farm diversification strategies, the results in this study are that farmers who were not involved in tobacco are more likely to venture into new enterprises. Perhaps tobacco farmers are not yet convinced that the ongoing market changes are irreversible. Alternatively, despite the recent woes of the tobacco economy, perhaps farmers cannot identify new ventures that are worth substituting for tobacco, or, due to prolonged safety in tobacco production, farmers have become less enterprising. The study also found evidence for asset fixity as a constraining factor for tobacco farmers who consider starting new ventures. The general implication of these findings is that entrepreneurship among tobacco farmers needs to be mobilized.

This study serves as a potential baseline for future agricultural or rural entrepreneurship studies. Further research is needed to assess the degree and motivations of potential and new

entrepreneurs in low-income regions. This research may help assess potential new policies to assist in addressing this problem in these regions.

## **References**

- Appalachian Regional Commission, October 2003.
- Bowler, *et al.* “The development of alternative farm enterprise: a study of family labor farms in the Northern Pennines of England.” *Journal of Rural Studies* 12 no. 3 (1996): 285 – 295.
- Bowler, I. “Modeling farm diversification in regions using expert and decision support systems.” *Journal of Rural Studies* 15 no. 3 (1999): 297 – 305.
- Capehart, Jr., C. T. “US Tobacco Industry Responding to New Competitors, New Challenges.” USDA, 2003.
- Carter, Sara. “The Indigenous Rural Enterprise: Characteristics and Change in the British Farm Sector”. *Entrepreneurship and Regional Development*, 8 (1996): 345 – 358.
- Childress, T. Michael. “Data foretell most Vulnerable Tobacco Counties”. *Foresight*, 7, no. 1 (2000).
- Childress, T. Michael. “The Future of Burley Tobacco: Potential Outcomes, Points of Leverage and Policy Recommendations.” Frankfort, Kentucky: Kentucky Long-Term Policy Research Center. 1994.
- Ernest Shtatland, Emily Cain and Mary B. Barton. “The Perils of Stepwise Logistic Regression and how to Escape the Using Information Criteria and the Output Delivery System.” Paper 222-26, SUGI 26. Proceedings of the Twenty-Sixth Annual SAS<sup>®</sup> Users Group International Conference. Cary, NC: SAS Institute Inc., 2001. April 22 – 25, 2001.
- Foster, Lucia. “The Appalachian Economy, Establishment and Employment Dynamics, 1982 – 1997: Evidence from the Longitudinal Business Database.” Bureau of the Census, Center for Economic Studies. May 2003.
- Ilbery, B., Healey, M. and Higginbottom J. On and Off-farm Business Diversification by Farm Households in England. In B. Ilbery, Chiotti, Q. and Rickard, T. (eds). *Agricultural Restructuring and Sustainability. A Geographical Perspective.* 1997.
- Snell, W. and Goetz, S. “Overview of Kentucky’s Tobacco Economy.” Lexington, Kentucky: Cooperative Extension Service, University of Kentucky. 1997.
- United States Department of Agriculture, National Agricultural Statistics Service, 2001.  
Available at <http://www.nass.usda.gov/ky/Pamphlet/tobpam02.pdf>
- Snell, W. “Overview of Kentucky’s Tobacco Economy.” Lexington, Kentucky: Cooperative Extension Service, University of Kentucky. 1996.
- Wood, E. L. “The Economic Impact of Tobacco Production in Appalachia.” Appalachian Regional Commission. November, 1998.

## Appendix

**Table 6: Cross Tabulation of Tobacco Income and Tobacco Activity in the Past Year**

	<b>Tobacco Income as a share of household income</b>			
<b>Tobacco Activity</b>	No response	Up to 20%	21% – 50%	Over 50%
No response	3		1	1
Present		109	153	159
Not present	332		6	1

**Table 7: Farming Motivations**

<b>Motivation</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Non economic motivations	---	---
Way of life	505	0.66
Good way to raise a family	439	0.57
Enjoyable activity	629	0.82
Monetary motivations		
To supplement off farm income	248	0.32
Tax benefits	110	0.14
Skill and Labor Market Constraints	---	---
Unable to find off farm employment	25	0.03
Farming is the sole experience	147	0.19
All responses	765	1

**Table 8: Age of Farm Operators**

	<b>Median</b>	<b>Mean</b>
Age	57	56.50

**Table 9: Investment in Skill Training**

Skill Spend	Frequency	Percent	Cumulative Percent
None	377	49.28	49.28
Conference, Seminar or Trade Show	50	6.54	55.82
Extension Training, Next Level Training, Work shop, or other	338	44.18	100

**Table 10: Farm Operator's Level of Education**

Level	Frequency	Relative Frequency
No formal education	13	0.02
Up to middle school	61	0.08
Middle school to HS or GED	310	0.40
Up to college, no diploma	179	0.23
Vocational cert or Associate's degree	67	0.09
Bachelors degree and above	136	0.18

**Table 11: Weekly On-Farm Hours of Employment**

Hours range	Operator		Spouse	
	Frequency	Relative Frequency	Frequency	Relative Frequency
Less than 10	188	24.54	569	74.28
10 - 29	274	35.77	135	17.62
At least 30	304	39.69	62	8.10

**Table 12: Weekly Off-Farm Hours of Employment**

Hours Range	Operator		Spouse	
	Frequency	Relative Frequency	Frequency	Relative Frequency
Less than 10	368	48.04	404	52.74
10 - 29	71	9.27	70	9.14
At least 30	327	42.69	292	38.12