Employment History and Off-Farm Employment of Farm Operators

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Abstract

Employment history affects subsequent choices. Based on their original job choice, operators are divided into farmers and workers. Equations are estimated to determine their probabilities of working off-the-farm. Education increases the probability that workers work off-the-farm, whereas vocational training increases farmers' probability. The probability of working off-the-farm decreases as unearned income increases, and its impact on workers is larger than on farmers. An employed spouse increases the probability that farmers work off-the-farm, but has the opposite impact for workers. Employment density increases the probability that workers will work off-the-farm.

Key Words: off-farm employment, part-time farming, small farms

Much of the literature on off-the-farm work by farm families begins with a discussion of whether farm families are being pushed off the farm by farm debts or pulled off the farm by better economic opportunities (Fuguitt, 1958; Buttel, 1982; Spitze and Mahoney, 1988). Such discussion assumes the family was farming and then made decisions about working off-the-farm. As a result, much of the literature on part-time farming also implicitly assumes that part-time farming is transitional and that the goal of the family is to be full-time on the farm. Mage (1976) suggests that such assumptions be tested by examining the intentions and motivations of part-time farmers.

The increasing trend in the percentage of operators who work off-the-farm, as documented in the *Census of Agriculture*, is a strong argument that part-time farming is *not* transitional. For example, operators in Virginia have a long history of working off-the-farm. In 1964, sixteen percent of operators worked some days off-the-farm; by 1992, fifty-six percent did. The percentage of operators who work full-time off-the-farm has increased even more rapidly (Bureau of the Census).

Spitze and Mahoney (1988) argue that lack of growth in off-farm earnings during the 1980s increased the probability of farm operators working *on* the farm. Findeis, Lass and Hallberg (1991, p.268) also note: "Declines in rural wages in manufacturing and in the service sector in some regions make it more unlikely that labor will move out of agriculture." In fact, this scenario may increase the likelihood of labor moving into agriculture to supplement declining wages in other sectors. The need for additional income was noted in many studies of part-time farming during the depression (Salter and Diehl, 1940). At that time, part-time farming was viewed as a supplemental income for low industrial wages. In fact, the declining trend in farm numbers, which began in 1921, reversed during the depression, and then continued downward again (Ahearn and Lee, 1991).

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In other words, non-farm families might be pushed or pulled into farming (Kada, 1980). The non-farm family may be pulled into farming by an attractive lifestyle (Bartlett, 1986). The family might also be pushed into farming by the need for a tax shelter (Findeis, Lass, and Hallberg, 1991) or for additional income (Stallmann and Alwang, 1992).

Approximately sixty percent of part-time farmers in Wisconsin started farming while holding other jobs (Kada, 1980). In Dodge County, Georgia, Bartlett (1991) found 67.4 percent of part-time farmers started farming while holding a non-farm job. Wisconsin families for whom farming was a later job decision differed in motivations, choice of farm enterprises, etc. from families for whom farming was the original job decision (Kada, 1980). It is likely that the different motivations of these families also affect their decisions about off-farm work.

Virginia farm operators were divided into two groups depending upon the circumstances at the time they started farming. Operators who started farming while holding a non-farm job are called workers. Operators who went directly into farming are called farmers. Farmers and workers have differing objectives for their farms (table 1). The farmer is most likely to respond that the farm is a profit-oriented business. While still profit-oriented, a third of workers view the farm as a second income. Because the farm is secondary, the primary job will be given priority over the farm in decision-making.

A high percentage of both farmers and workers only expect the farm to break even. While this indicates cost awareness, it is not clearly profit oriented. Operators with this objective may be using the farm as a tax shelter, holding family land for sentimental reasons, etc. Some of these operators may also view the farm as a hobby which must pay for itself. The percentage of operators who view the farm completely as a hobby is low. It seems likely that the differing objectives of the two groups will affect their probability of working off-the-farm.

While previous research shows that the circumstances under which an operator entered farming affect the farm (Kada, 1980), the objective of this study is to test whether the circumstances under which an operator entered farming affect later decisions about off-farm work. The study examines whether the probability of off-farm work differs between operators who started farming while holding a non-farm job (called workers) and those who farmed first (called farmers). In addition, the study examines whether several factors, particularly education and location, have a differential impact on the two groups of operators. The literature on off-farm employment reports inconsistent findings on the impacts of these two variables. It is the hypothesis of this paper that not controlling for differences between the two groups of operators may result in inconsistent findings.

The next section summarizes the literature on off-farm work, concentrating on education and location. Then the empirical model is presented, the data set is discussed, and the model results presented. A summary, policy implications, and research suggestions follow.

Table 1. Objective That Best Describes The Farm

Farm Objective	Farmers	Workers
The farm is a business that must make a profit	44.14	12.38
The farm is a second income	16.52	33.66
The farm should at least break even	32.43	42.57
The farm is a pastime and doesn't have to break even	6.91	11.39

Chi Square (3) 62 047, p=.00

Literature Review

Analysis of off-farm work by farm families is based on neo-classical labor supply theory. Members of farm families allocate their time based on the marginal returns to labor in off-farm and on-farm work (Lee, 1965; Bollman, 1979, and Huffman, 1980). The return to off-farm work is the wage rate. The return to on-farm work is the marginal value product of labor on the farm. The individual chooses to work off-the-farm if the wage rate (net of commuting costs) is higher than the marginal value product of their labor on the farm. The individual's comparative advantage determines which will give the higher return (Sumner, 1991).

Individuals self-select into the job for which they have a comparative advantage. Comparative advantage is based in part on past training and job experience. Thus, the current decision of whether to work off-the-farm is influenced by past decisions--of interest in this case, whether or not the operator held a non-farm job before starting to farm.

Education increases the job opportunities open to the operators. The impact of education on off-farm work is ambiguous because education can raise the marginal value product of labor in both uses (Huffman, 1977, Huffman, 1980). Some research suggests that education has more impact on the off-farm wage than on the on-farm marginal value product and thus tends to encourage off-farm work (Huffman, 1976; Findeis and Reddy, 1988; Gunter and McNamara, 1990; Lass, Findeis, and Hallberg, 1991). On the other hand, Findeis, Lass, and Hallberg (1991) found that education had no effect on the probability that Pennsylvania operators worked off-the-farm. Sumner (1982) also reported no significant effect. The conflicting findings could be due to mixing of various subgroups of farmers in a single equation. Simpson and Kapitany (1983) found varying impacts of education on the probability of off-farm work among subgroups of operators in their sample.

Off-farm labor demand limits the choices open to farm operators. Two workers with the same skills will face different job opportunities depending on where they are located (Killian and Tolbert, 1993; Findeis, Lass, and Hallberg, 1991). Location is one aspect of demand--are operators located within commuting distance of a job, or did they buy a farm within commuting distance of a job?

Although theoretically important, Findeis, Lass, and Hallberg (1991) find that location has generally been a poor indicator of off-farm work. Empirical specification of location variables may be the problem. Most studies have used binary variables to delineate location along political boundaries such as states or counties (Reddy and Findeis, 1988). Several studies have used binary variables to break states into broad geographic regions (Sumner, 1982; Leistritz, et al., 1985).

Findeis, Lass, and Hallberg (1991) used structural variables at the county level. Several of the structural variables did have an impact on the probability of off-farm work. While the structural variables point more clearly toward policy options than binary variables, they still are based on political jurisdictions.

Binary or structural variables for political jurisdictions, while convenient because of data availability, do not necessarily correspond to the area in which an operator might search for a job. Labor market areas and commuting zones, which are based on commuting patterns between counties, may be more appropriate location variables as a proxy for labor demand (Tolbert and Killian, 1987; Killian and Tolbert, 1993).

Model

Because the individual is choosing between working off-the-farm or not, the relevant measure to be explained is the probability of choosing one or the other (Deaton and Muellbauer, 1980). The reader is referred to Reddy and Findeis (1988) and Gunter and McNamara (1990) for the development of the probability model. Similar models have been used to address a variety of circumstances--hired farm labor (Perloff, 1991), union membership (Lee, 1978), and female labor supply (Heckman, 1976).

Ideally, a choice model for the original job decision would be estimated and the current choice would be dependent on the previous choice. Data are not available to estimate the choice model for the original job decision. Instead, two probit equations are estimated. One equation pools

farmers and workers (the restricted model), as has been done in past research. The second equation separates farmers and workers (the unrestricted model) to test if different factors affect the current job choices of farmers and workers.

The probability of working off-the-farm is influenced by the wage (net of commuting costs) that the operator can expect to receive relative to the operator's reservation wage. The operator will decide to work off-the-farm (D=1) if the off-farm wage (w) is higher than the reservation wage (r):

$$D = 1 \text{ if } w > r. \quad (1)$$

The operator will not work off-the-farm (D=0) if the off-farm wage is less than or equal to the reservation wage:

$$D = 0 \text{ if } w \leq r. \quad (2)$$

The probability of working off-the-farm is influenced by the wage that the operator can expect to receive. In turn, the wage is influenced by the jobs available (labor demand) within commuting distance and by the match of the operator's job skills (human capital) to the available jobs. In addition, the operator faces factors that may encourage or discourage working off-the-farm (labor supply). These factors include the other sources of family income and the need for income created by family size. To measure the influence of these factors on the likelihood that the operator will work off-the-farm, probit models of the following form are estimated:

$$\Pr(D = 1) = f(AGE, AGE2, EDUC, VOC, SEX, CHILD, SPEMP, MARRY, UNINC, CONST, SERV, MANUF, GOV, DNSTY) \quad (3)$$

where

AGE = Age of the operator
AGE2 = Age of the operator squared
EDUC = Education of the operator
VOC = 1 if the operator has non-farm vocational or on-the-job training, zero otherwise
SEX = 1 if male, zero otherwise
CHILD = number of children under 18 in the home
SPEMP = 1 if the spouse is employed, zero otherwise
MARRY = 1 if married, zero otherwise
UNINC = unearned income in 1000s of dollars
CONST = percentage of commuting zone employment in construction
SERV = percentage of commuting zone employment in services
MANUF = percentage of commuting zone employment in manufacturing
GOV = percentage of commuting zone employment in government
DNSTY = commuting zone employment density

The above specification is the restricted model. The unrestricted model contains slope and dummy variables for operators who are classified as workers. The variables included in the model are discussed below.

Measures of the operator's human capital include the operator's age (*AGE*), formal education (*EDUC*), and vocational training (*VOC*). Both age (*AGE*) and age squared (*AGE2*) are used in the equation to reflect the expected deterioration of job skills over a lifetime and the impact of increasing age on the ability to work two jobs (Kada, 1980). Because workers are likely to consider their jobs a career rather than a temporary measure, age is expected to have less of an impact on the probability that workers work off-the-farm than on farmers. The probability of working off-the-farm is expected to decline more rapidly with age for farmers than for workers.

Education (*EDUC*) is measured as years of formal education. As discussed above, the conflicting findings concerning the impact of education on the probability of working off-the-farm could be due to mixing of various subgroups of farmers in a single equation. If farmers take whatever job is available, or match the job hours to farm hours, rather than trying to closely match the job with their skills, the impact of education on their probability of working off-the-farm while positive, is expected to be less than that of workers.

Vocational training (*VOC*) is defined as a binary variable with a value of one if the operator

has non-farm vocational or on-the-job training and zero otherwise. Vocational training is expected to increase the probability that the operator works off-the-farm because it offers a way to match skills with available jobs. Its impact on farmers' probability of off-farm work is expected to be larger than on workers'.

The job choices for farm operators will be limited by the off-farm labor demand. Two operators with the same skills will face different job opportunities because of their locations (Killian and Tolbert, 1993). Findeis, Lass, and Hallberg (1993) found that employment density, and the changes in county manufacturing and service employment, positively affected the probability of off-farm work in Pennsylvania. Distance to the nearest town had no impact, perhaps because of little variation in this variable. Gunter and McNamara (1990) used the unemployment rate and the employed civilian labor force in the labor market area to reflect wage levels and job opportunities. They also included the percentage of total employment in each of the four sectors with the largest number of part-time employees. Unemployment negatively affected the probability of off-farm work. The percentage of employment in manufacturing and in professional services increased the probability of off-farm work. The other variables had no impact.

For this analysis, commuting zones were chosen as the basis for location variables, rather than labor market areas, because they more accurately reflect actual commuting (Killian and Tolbert, 1993). Twenty-two commuting zones contain at least one Virginia county or city. Structural variables for commuting zones are used to measure demand for labor.

Employment density (*DNSTY*) in the commuting zone is used as a measure of job opportunities within commuting distance to counteract situations where commuting takes place from only part of the county. The higher the employment density, the more likely operators will work off-the-farm. Because farmers are less likely than workers to have located based on job opportunities, employment density is expected to have a greater impact on workers than on farmers.

The majority of Virginia operators who work off-the-farm are employed full-time and prefer those hours (Stallmann and Alwang, 1992). Thus, focusing on jobs that provide part-time hours, as Gunter and McNamara (1991) did, appears less important than jobs that match operators' skills and education. The major sectors in which Virginia operators are employed include: services (25% of operators who work off-the-farm), construction (18%), public administration (17%), and manufacturing (13%). These four sectors are also the major sources of employment in rural areas. Because of their higher levels of education (table 2 below), workers are expected to respond more to the availability of service (*SERV*) and government (*GOV*) jobs, whereas farmers are expected to respond to the availability of construction (*CONST*) and manufacturing (*MANUF*) jobs, which use manual skills.

Factors that affect the supply of off-farm labor and, thus, the probability of working off-the-farm, include the other sources of income for the family: unearned income and income earned by the spouse. Unearned income (*UNINC*) is measured in thousands of dollars. A binary variable is included to indicate whether the spouse works off-the-farm (*SPEMP*). Both sources of additional income are expected to reduce the probability that the operator will work off-the-farm for both farmers and workers.

The number of children (*CHILD*) increases the income needed to maintain the family. The additional income can be earned by working off-the-farm or by increasing on-farm hours. Thus, the expected impact on the probability of off-farm work is ambiguous. No difference is expected between farmers and workers.

Data

The *Census of Agriculture* definition of a farm--normally generates at least $1000 in gross sales annually--was used. A random sample of farms was drawn from the list of farms maintained by the Virginia Agricultural Statistics Service. Farms were drawn in proportion to the number of farms in each county. Nine hundred and sixty-one families were contacted by telephone. One hundred and twenty-three families declined to participate in

the survey. Forty-eight families were contacted but the operator or spouse could not be reached even with call-backs and the families were replaced by the next family on the list. Surveys for five families were discarded for lack of complete information or because the family did not meet the definition of operating or managing a farm. Completed surveys were obtained for 785 families who gave information for 1988. When retired operators and observations with missing variables are removed from the data set, 535 observations remain.

The survey focused on the allocation of labor by the operator and spouse (if married) and the sources of family income. During the survey, respondents were not asked directly if the original job of the operator was on- or off-the-farm[1]. The respondents were asked the number of years the operator had farmed and the number of years the operator had worked off-the-farm. From this information two groups of operators were defined:

1) Operators with more years of off-farm than on-farm experience are referred to as workers. Workers may have been pushed or pulled into farming.

2) Operators with more years of on-farm than off-farm experience are referred to as farmers. Farmers may have been pushed or pulled off of the farm.

An operator whose employment history began with a non-farm job and who then became a full-time operator may be misclassified in group two, depending upon the relative number of years spent as a full-time operator. Although the potential misclassification is recognized, this is the best data set available to examine the question.[2] Only operators are used in the analysis because the survey did not provide a good measure of the spouse's years of on-farm experience.

Empirical Analysis

Similar to Kada's (1980) findings in Wisconsin, there are differences between the two groups of operators and their farms on some characteristics (table 2). Farmers have a year less education than workers. The percentage of workers who have non-farm vocational training is much higher than for farmers (51 percent to 29 percent). There is no difference in the average age of the two groups of operators. Although there is no theoretical reason to expect a difference, other studies have shown a generational difference.

Although of the same age, the two groups of operators differ significantly in their average years of both on-farm and off-farm experience. Currently, 39 percent of farmers and 75 percent of workers work off-the-farm. Even among farmers, over 70 percent have worked off-the-farm at some time in their career. Among those farmers who have worked off-the-farm the average years of off-farm experience is 16.

Similar to findings by Kada (1980), the farms of these two types of operators differ in acreage, operators' hours on the farm, and net farm income. Farmers have twice as many acres in production, put in nearly twice as many hours on the farm, and have net farm income two and one-half times that of workers. The two groups of operators do not differ on their debt-to-asset ratios, whether they hire labor, and whether they plan to continue farming.

Family income differs between the two groups. Family income for workers is about $7000 higher than farmers. Unearned income, a component of family income, does not differ significantly between the two groups. Spouses of workers have higher incomes than spouses of farmers.

Two participation equations were estimated using probit models (table 3). The first equation (the restricted model) pooled the two groups of operators, as has generally been done, to estimate the probability of off-farm employment. The second equation (the unrestricted model) uses intercept and slope dummy variables to test for the hypothesized differences between farmers and workers. The unrestricted equation is reported in the last two columns of table 3. For the unrestricted equation, the first column of coefficients estimates the impact of the variables for farmers. The second column of coefficients for the unrestricted equation estimates the differential impact between farmers and workers. The impact for workers is found by

Table 2. Characteristics of Virginia Operators, Farms, and Families

	Farmers	Workers	Statistically Significant Difference*
Average Years of Education	11.5	12.5	YES
% with Vocational Education	29.1	51.0	YES
Average Age	52.8	51.1	NO
% Currently Working Off-Farm	38.7	74.8	YES
Average Years of Off-Farm Experience	11.4	29.2	YES
Average Annual Off-Farm Hours	6022.0	1422.0	YES
Average Years of On-Farm Experience	31.9	19.8	YES
Average Annual Hours on the Farm	2318.4	1344.7	YES
Average Acres in Production	203.0	93.3	YES
% with Debt to Asset Ratio $\leq .4$	90.0	91.0	NO
% Plan to Continue Farming	91.7	94 0	NO
% Hire Labor	53.5	47 5	NO
Average Net Farm Income	17633 6	7517.8	YES
% spouses who work off-farm	31.2	45.1	YES
Average Spouse Income	4830.6	7325.6	YES
Average Unearned Income	4183.8	5575.7	NO
Average Family Income	35315.3	42475.2	YES
Number of Children	.6	.6	NO
Number of Observations	333	202	NA

*Two-tail *t*-test statistical significance, p=.05

adding the two columns of coefficients. A log-likelihood ratio test was performed to test the joint impact of the dummy variables, which were found to be significant. A third equation using just an intercept dummy was also run. A log-likelihood ratio test between it and the unrestricted model was also statistically significant. For this reason, only the unrestricted model is reported.

The coefficients in the restricted equation are, for the most part, of the expected signs, although not always statistically significant. As expected, the probability of working off-the-farm increases (until nearly age 59) and then decreases with age (*AGE* and *AGE2*). Education (*EDUC*) and vocational training (*VOC*) increase the probability of working off-the-farm. As expected, unearned income (*UNINC*) decreases the probability that the operator works off-the-farm. Unexpectedly, an operator with a spouse employed off-the-farm (*SPEMP*) is more likely to work off-the-farm. The operator's sex (*SEX*), whether the operator is

Table 3. Probability of Off-Farm Work of Farm Operators

	Restricted Equation	Unrestricted Equation	
		Farmers	Difference of Farmers and Workers
CONSTANT	-.6250	.7146	.8150
	(1.347)[a]	(1.705)	(3.6185)
AGE	.0709[d]	.0707	.0401
	(.0382)	(.0470)	(.1099)
AGE2	-.0006[d]	-.0005	-.0006
	(.0004)	(.0004)	(.0011)
EDUC	.0622[b]	.0222	.1345[b]
	(.0195)	(.0264)	(.0506)
VOC	.6347[b]	.6466[b]	-.1767
	(.1247)	(.1648)	(.3053)
SEX	.2900	.0931	.3853
	(.2407)	(.3009)	(.5645)
CHILD	.0089	.0539	.0002
	(.0661)	(.0793)	(.2020)
SPEMP	.4242[b]	.5709[b]	-.7098[c]
	(.1313)	(.1698)	(.3280)
MARRY	-.0890	-.1278	.0128
	(.1936)	(.2455)	(.4905)
UNINC ($1000s)	-.0270[b]	-.0089	-.0691[b]
	(.0069)	(.0087)	(.0171)
CONST	-.0587	-.0291	-.1556
	(.0494)	(.0626)	(.1260)
SERV	-.0488[d]	-.0522	-.0250
	(.0281)	(.0358)	(.0688)
MANUF	-.0271[b]	-.0266[c]	-.0202
	(.0104)	(.0135)	(.0266)
GOV	-.0283[d]	-.0322[d]	.0021
	(.0154)	(.0194)	(.0392)
DNSTY	.0001	.0000	.0059[d]
	(.0009)	(.0012)	(.0034)
% correct predictions	64.7	73.4	
% correct predictions of 0	68.6	78.4	
% correct predictions of 1	66.7	68.9	
Log-likelihood	-323.07	-274.00	
Chi Squared (14)	94.36	192.49	
Probability of Chi Squared	.00	.00	

[a]Standard errors in parenthesis
[b]Statistical significance, p=.01
[c]Statistical significance, p=.05
[d]Statistical significance, p=.10

married (*MARRY*), and the number of children (*CHILD*) do not affect the probability of working off-the-farm.

Contrary to expectations, the coefficients for four of the five location variables have negative signs and the coefficients for three--service (*SERV*), manufacturing (*MANUF*), and government (*GOV*) employment--are statistically significant. The percentage of construction jobs (*CONST*) and employment density (*DNSTY*) do not significantly influence the probability of working off-the-farm.

While the age variables (*AGE* and *AGE2*) are significant in the restricted equation, in the unrestricted equation they are not. As expected, education (*EDUC*) has a larger impact on workers than on farmers. Inconsistency in previous research of the impact of education on the probability of working off-the-farm might be explained by the relative mix of the two groups in the restricted (or pooled) equation.

Vocational training (*VOC*) increases the probability that farmers work off-the-farm. While not statistically significant, the negative coefficient on the dummy variable indicates that vocational training is less important for workers than for farmers, even though more workers have vocational training. When the farmer takes a job, it is less easy to fit the job to the farmer's education because of the farmer's fixed location. It may be more important to fit the job around farm work hours. Vocational and on-the-job training offers the farmer a rapid method of acquiring the skills needed for the jobs that are locally available.

Unearned income (*UNINC*) has the expected negative impact on the probability that the operator works off-the-farm. Although no difference between farmers and workers was hypothesized, the difference is statistically significant, and workers are less likely than farmers to work off-the-farm as unearned income increases. Farmers whose spouses are employed (*SPEMP*) off-the-farm are more likely to work off-the-farm. On the other hand, an employed spouse decreases the probability that a worker will work off-the-farm.

The number of children (*CHILD*) does not significantly affect the probability of the operator working off-the-farm. This is not surprising given that the expected impact was ambiguous. The sex (*SEX*) of the operator and marital status (*MARRY*) do not influence the probability of either the farmer or the worker working off-the-farm.

Density of employment (*DNSTY*) in the commuting zone increases the probability of off-farm employment by workers, as predicted. The variables reflecting the types of jobs available in the commuting zone did not perform as expected. Construction (*CONST*) and services (*SERV*) have no significant impact on the probability of farmers or workers working off- the-farm. Manufacturing (*MANUF*) and government (*GOV*) employment negatively affect the probability of farmers working off-the-farm. The differences between farmers and workers are not statistically significant.

In their literature review, Findeis, Lass, and Hallberg (1991) found that location generally has been a poor indicator of off-farm work. Several factors may have affected the performance of the location variables in the current study and should be considered in future research. During the 1980s, Virginia experienced rapid population growth, rapid job growth, changes in the industrial mix of the economy, and large internal migration. Commuting zones based on 1980 commuting patterns may not reflect 1988 economic relations.

The negative impact of manufacturing (*MANUF*) on the probability of working off-the-farm may be due to two factors. Manufacturing jobs in rural Virginia tend to be routine manufacturing, employing many people with very low levels of education. Farm operators have higher average levels of education than the general population and may be over-qualified for the rural manufacturing jobs. In addition, manufacturing jobs tend to have very regimented hours in Virginia, averaging over 41 hours per week in 1988 (Virginia Employment Commission, 1992). This differs from Gunter and McNamara (1990), who classified manufacturing as having a large number of part-time jobs. Other jobs that provide full-time work but with a bit more flexibility may be preferred.

In addition, industries contain a broad mix of jobs, ranging from chief executive officer to janitor. Jobs within occupational categories are more homogeneous than within industries. Occupations more accurately specify jobs skills and may be a better way to match operator's skills to the local labor market. Unfortunately, these data generally are available for census years only.

Summary

Rather than assuming that farm operators are pushed or pulled off the farm, researchers and policy makers must consider that workers may also be pushed or pulled onto the farm as relative returns to labor vary between sectors. Thus, if wages

continue to fall, more and more families may use part-time farming as a means of supplementing family income. Workers, farm operators who entered farming from a non-farm job, differ from other farm operators in their motivations, education, vocational training, and family income. Farms operated by workers are smaller and provide a smaller percentage of the family income then farms operated by farmers.

In addition to its impact on the farm, the original job choice appears to have lasting impacts on the off-farm labor responses of workers when compared to farmers. The two groups respond to different variables or the same variable affects one group more than the other. Education (*EDUC*) increases the probability that workers work off-the-farm, but not farmers. Previous inconsistent findings about the impact of education may be due to the mix of the two groups in a single equation. Vocational training (*VOC*) increases the probability that operators work off the farm. The probability of working off-the-farm decreases for both groups as unearned income (*UNINC*) increases, but unearned income has a larger impact on workers. An employed spouse (*SPEMP*) increases the probability that a farmer will work off-the-farm, but has the opposite impact for workers. Employment density (*DNSTY*), a proxy for job opportunities, increases the probability that workers will work off-the-farm, but not farmers.

Designers of agricultural and rural policy need to be cognizant of the differences between these two groups of operators--they may respond differently to the same policy lever. Current discussions indicate that there may be major changes in agricultural policies. If farm incomes fall, offering vocational training to farmers may significantly increase their probability of off-farm work, enabling them to replace lost farm income. For families of farmers, availability of employment for both the operator and spouse is important. The mix of job opportunities appears to influence the probability of off-farm work. The traditional growth strategy of many rural communities--recruiting manufacturing firms--may not fit the job needs of farm families. Jobs with flexible hours may allow more families to increase their incomes through off-farm work.

Past research has indicated the difficulty of specifying appropriate measures of labor demand. The current research on part-time farming is the first to use commuting zones in measures of labor demand. Because they are based on 1980 data, the commuting zones may be outdated for Virginia, which experienced rapid change in the past decade.

As indicated by the years of both on- and off-farm work by both farmers and workers, the movement between farming and an off-farm job is a two-way street. Families who combine the two are able to secure higher family incomes. The current research addresses one part of the issue of the impact of motivations and past decisions on current decisions. Available data sets, however, do not allow examination of families who have made a complete transition from farm to non-farm work. In addition, they do not allow the examination of factors which influenced the original job decision of a farm or non-farm job. To examine such issues, data on job history, as well as the factors which influenced job decisions, are needed. Clearly this is a broad area of research and one which will benefit from collaboration between sociologists and economists.

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Endnotes

1. The original job refers to the job the operator held at the very beginning of his/her employment history. It should not be confused with the current primary employment.

2. As shown in table 2, the two groups of operators have significantly different years of on-farm and off-farm experience. This suggests that any misclassification is small. It is also recognized that operators who were farmers and made a complete transition to non-farm work are not part of the sample. Thirty-four

operators reported equal numbers of years on and off-the-farm. They were classified as workers. The equations reported in Table 3 were also estimated without these 34 cases. The size and significance of the coefficients were not affected, nor was the predictive ability of the equations.