

## AN ABSTRACT OF THE THESIS OF

Krishna K. P. Rauniyar for the degree of Doctor of Philosophy in Family Resource Management presented on January 12, 1996 Title: Determinants of Off-farm Employment among Oregon Farm Households: A Tobit Analysis.

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Abstract approved: \_\_\_\_\_

Geraldine I. Olson

An investigation was conducted to determine the impact of economic and non-economic factors on the off-farm work efforts of Oregon farm husbands and wives. A total of 283 Oregon farm households (with husbands and wives) were randomly selected from lists of persons deferring taxes for farm purposes, obtained from County Assessors' offices in each of eight randomly selected counties. Counties with larger number of farms had a higher probability of being selected. Data came from an Oregon State University Agricultural Experiment Station study conducted during 1988-89.

The empirical findings from the maximum likelihood Tobit model showed plausible directional impacts. Off-farm wage rate, the basis of a reduced labor supply model, was the key variable in explaining off-farm work. Wives' off-farm work response to off-farm wage was more elastic when compared to husbands' off-farm work. Additional significant variables to affect either or both husbands' and wives' total off-farm work were total farm debt, husband's age, education, urban/rural

location of farm, net farm income, age-square, farm life satisfaction, and total family income before tax.

Education was positively related to off-farm work only for wives. Results also indicate that high levels of net farm income as well as farm debt reduce the likelihood and extent of off-farm work. The location of the farm closer in proximity to metropolitan areas, was a significant factor in increased off-farm work hours.

Farm life satisfaction was negatively significant for both wives and husbands. The effect of farm life satisfaction was more prominent for wives than for husbands. Total family income was significant and negatively related to wives' off-farm work but not husbands, indicating that women may be more sensitive to a choice for leisure or household work and the motivation for husbands' off-farm work may be higher. Despite a substantial incidence of low profitability and low farm income from farming and some unhappiness and hard work, these farmers generally reported a high level of satisfaction with their farming operations. Any policy implications based on the findings of this study must be cautiously interpreted based on farm types and the work motivation of farmers in Oregon.

Determinants of Off-farm Employment Among  
Oregon Farm Households: A Tobit Analysis

by

Krishna K.P. Rauniyar

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Krishna K.P. Rauniyar

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Dedicated

to my parents

Narayan and Hulasi Devi Rauniyar

# Determinants of Off-farm Employment Among Oregon Farm Households: A Tobit Analysis

## CHAPTER 1

### INTRODUCTION

Over 4.4 million farm operators, hired farm workers, and unpaid farm workers, or 57 percent of all persons employed on US farms in 1987, did some nonfarm work for cash wages or salary. Among those farm operators who did nonfarm work, the nonfarm work accounted for a major portion of their work time and was an important source of income, although characteristics of the nonfarm jobs varied significantly among occupational groups. Relatively few of the farmers who did nonfarm work considered their farm job to be their primary employment (USDA, January 1990). This overlap of farm and nonfarm employment has important implication for the economic well-being of farmers and farm families.

The percentage of farmers with nonfarm employment has increased over time. Census of Agriculture (1987) data reveal that the proportion of farm operators working nonfarm jobs increased from 39 percent in 1949 to 53 percent in 1982. There has been a significant trend for the economic welfare of farm families in the US to become increasingly dependent upon income from off-farm employment. It may also be that the number of people engaged primarily in nonfarm work who seek to establish farms are also adding significantly to these numbers. Government statistics show that net cash income of farm families is comprised of 57 percent from

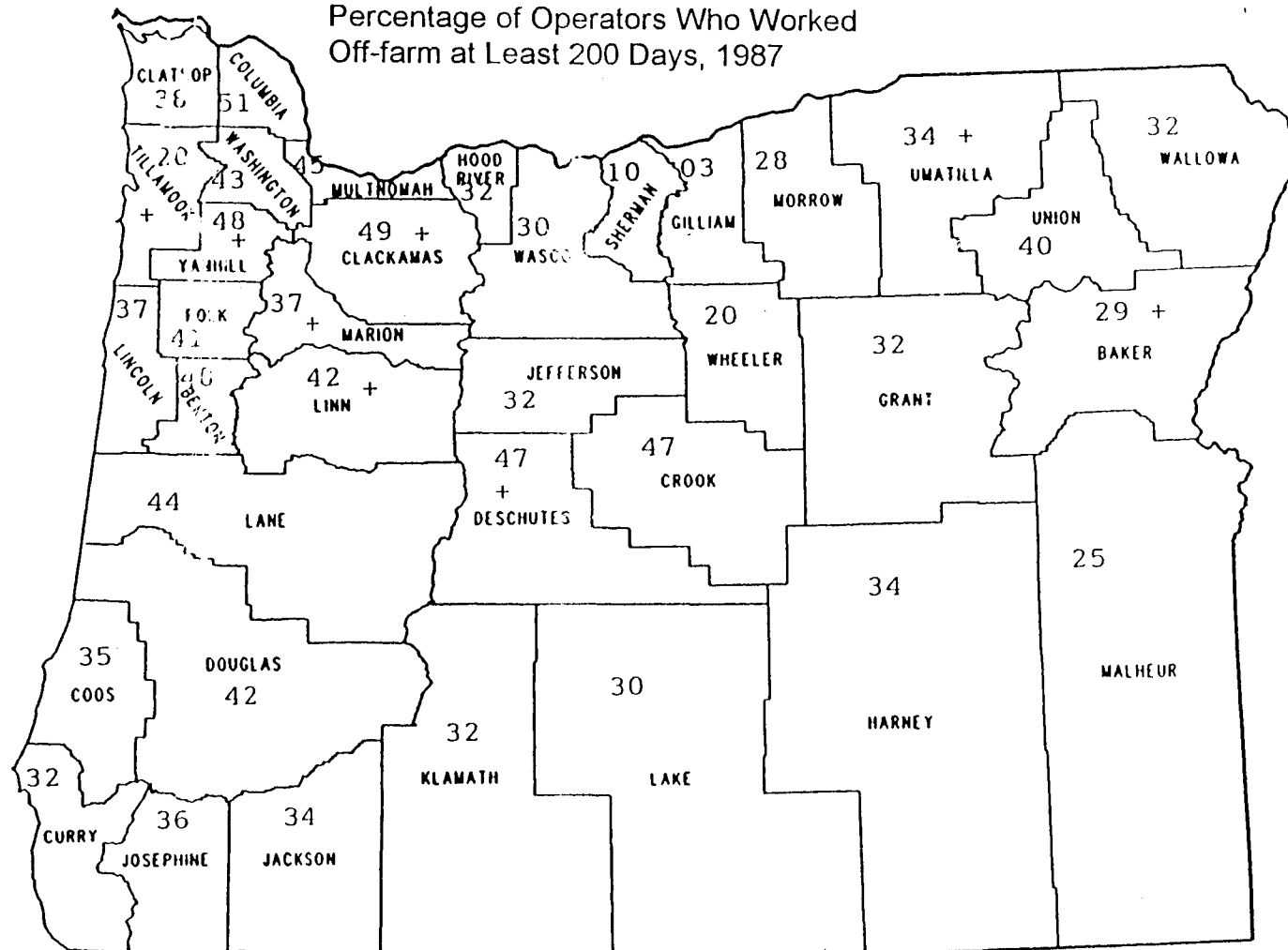
off-farm income, 29 percent from sales of agricultural products, 12 percent from governmental payments, and 2 percent from other farm related income. For farmers involved in all types of farming, an average of over half their net cash income is dependent upon off-farm employment, with net sales from agricultural products contributing less than a third of the total net cash income. Farm owner-residents and non-owner-residents of the farm do not differ significantly in share of farm earnings (Deseran, et al, 1984). The USDA estimated that 43 percent of the total income of farm operator households came from off-farm sources in 1960, and 54 percent came from off-farm sources in 1984 (Ahearn, 1986).

Farm financial stress is a timely consideration that may be a small part of the off-farm work question (Hewlett, 1987). Farming in the US has been characterized by declining profits, falling land values, and a shrinking number of farmers. The reasons for such changes can be attributed to technological advances, declines in US exports, increased international competition, and low commodity prices associated with the global oversupply of food and fiber (Tweeten 1989). Such macro-economic considerations add to the economic stress of farm families. In the process of financial adjustments, farm couples may turn to the nonagricultural sector. To reduce their economic stress, farmers may attempt to improve their farm productivity along with earnings from off-farm work. Some farm households may move to off-farm jobs to gain wages and fringe benefits, while others may view off-farm work as a temporary adjustment until the farming operation again becomes self-supporting.

Figure-1 shows the 1987 level of off-farm employment for farm operators in Oregon counties. The figures inside each county show the percentage of operators who worked off-farm at least 200 days in 1987. Counties with a plus sign inside indicate the selection of these counties in the study. It is evident from Figure-1 that in all counties except for Sherman and Gilliam, between 20 and 51 percent of farmers worked 200 or more days in off-farm in Oregon (Oregon Census of Agriculture, 1987). The average percentage of farm operators who worked between 1 to 200 or more days in off-farm work was 57.7 percent in 1992 (1992 Census of Agriculture of Oregon) compared to 59.1 percent in 1987 (1987 Census of Agriculture of Oregon). Still off-farm work is practiced by more than half of Oregon farm households (1987 Oregon Census of Agriculture). The number of farmers in off-farm employment in Oregon has increased with the increase leveling off in the past 5 years (1987-1992) according to 1992 Oregon Census of Agriculture.

Generally, agricultural economists consider off-farm income as a by-product (i.e. as a secondary job) of farming (Larson and Hu, 1977; Lee, 1980). But, over the last 15 years due to developing economic conditions in the US as well as many other countries, off-farm income increased at a faster rate than farm income (Larson and Hu, 1977). In accounting for the survival of farm families, Friedberger (1989) argues that successful farm families share the following traits: they tend to be risk averse, to diversify their operations or rely on family labor, to be frugal in their use of credit, and to pass land on to the next generation.

### Percentage of Operators Who Worked Off-farm at Least 200 Days, 1987





Nonfarm employment may be one way that new farmers manage the high capital investment needed to establish a farm operation. Income from nonfarm work may also enable many small-farm operators to continue farming, especially in years when the farm does not make a profit. The seasonality and relatively low wages in the farming sector may also mean that many farm operators take on off-farm and nonfarm work to supplement their total household income. Nonfarm work may also help those persons leaving farming, by helping them develop with skills they need to qualify for jobs in the nonfarm sector (USDA, Jan. 1990).

Especially in Oregon, there is a growing trend of farms getting smaller in landsize. According to the 1992 Oregon Census of Agriculture, the average size of farm has decreased from 682 acres in 1974 to 552 acres in 1992 (19.1 percent). In addition, the number of corporate and cooperative farms has increased from 1,185 farms in 1978 to 1,905 farms in 1992 (60.8 percent). The number of individual or family (sole proprietorship) farms decreased from 29,802 in 1982 to 27,506 in 1992 (7.7 percent) according to 1992 Oregon Census of Agriculture. There has been a gradual decrease in number of farms in Oregon since 1982 (1992 Oregon Census of Agriculture). The number of farms in Oregon in 1982 was 34,087 but had decreased to 31,892 farms in 1992 (1992 Oregon Census of Agriculture).

There have not been many empirical studies done on both micro and macro aspects affecting off-farm employment of farmers in Oregon. Many of the studies are done in the Midwest agricultural states where the agricultural system is different than in Oregon. Especially, not many such studies have been done in Oregon

incorporating both micro and macro aspects of the labor market and non-economic factors, such as farm life satisfaction, to study off-farm employment behavior. The agricultural system in Oregon is very diverse, with a combination of many types of crops being grown each season. Oregon agriculture is also characterized by mostly small farms where more than half of Oregon farms are under 50 acres (1987 Oregon Census of Agriculture). Oregon also experiences a large influx of migrant farm workers, from adjoining states like California and Arizona, and from Mexico which directly affects the supply of farm labor.

Most of the studies that have been done in Oregon, have focused on the reallocation of farm labor to nonfarm labor markets as a result of wage differentials in the nonfarm sector. Thus, research which is more broadly based, incorporating a wide range of factors which may influence changes in farm/off-farm employment and have implications for agricultural and employment strategies and policies is appropriate. For example, at the macro level, we know that off-farm employment is often a feasible alternative for farmers wishing to retain a rural residence. This has been made possible, in part, by advances in farm labor-saving technology which allows for more flexibility in the allocation of labor. In addition to labor-saving technology available in agriculture, at the micro level, a farmer may alter the operational structure of the farm by actually substituting off-farm employment for certain farming enterprises e.g. labor-intensive crops like vegetables and fruits. On the other hand, farm employment may be becoming increasingly attractive to individuals/families primarily employed in urban areas. This is an area which has

received less attention, but which offers an alternative explanation for trends which are being observed.

Sentiments about farming and landholding have been guiding principles affecting the citizen's role in national life in the United States. These ideas shape expectations for government actions and feelings about farms as social and economic units for production (Comstock 1987). These principles find strong support among farmers and rural residents. Results from a mail survey of a national sample of households suggest that these sentiments remain tied to rural and agricultural experiences, age, liberal political orientation, and are inversely related to education and income (Molnar and Wu, 1989 p 227).

A study of the off-farm employment issue is important from several perspectives. In this study, questions relating to the financial situation of farms, future performance expectation of farms, and future expectation of income from farm and off-farm work will be used to determine the work configuration of farm operators. Off-farm work, with respect to lifestyle satisfaction, will also be investigated to assess the relationship of off-farm work to other aspects of family living.

There are additional factors such as education, gender, work experience, and age which may affect the marginal values of time in a household utility maximizing framework. These variables have important implications for the paid work-related decisions. In terms of utility maximizing behavior, members of farming households are assumed to behave by responding to economic incentives that encourage them to allocate their resources to farm/off-farm work in rational ways.

Results of this study may suggest strategies and policies to educators, development planners, bankers, labor leaders and state and federal government agencies involved in employment creation, and to other organizations that serve rural and urban communities. This study may also provide information to help frame employment policies relative to farm/off-farm work of family members.

### Research Objectives

The main objective of this study is to determine the important economic, household and demographic factors that affect the amount of off-farm labor supplied among Oregon farm operators. The overall objective of the research is to gain understanding about how and why Oregon farm households allocate their time to farm and nonfarm work.

The specific objectives of this research are to:

(1) explore the main microeconomic factors such as human capital, farm characteristics, household characteristics, and wealth holdings that affect the supply of off-farm labor among Oregon farm households.

(2) characterize the non-economic factors and examine the effects of lifestyle preferences, labor market conditions, and location factors on off-farm work participation decisions of Oregon farm households, especially in relation to:

- i. how farmers feel about their work
- ii. how farm life relates to family life
- iii. the role of off-farm jobs in retaining farm residence, and
- iv. farmers' opinions of the future of farming

(3) draw implications for policy development.

#### Definition of Terms for this Study

Farm: any place from which \$1,000 or more of agricultural products were sold or could have been sold during the census year, and land taxes were deferred for farm purposes.

Household: a household is defined as farm household by USDA if it is owned by husband and wife and has had at least \$1,000 in annual farm sales or owned crops and livestock valued at \$ 1,000 or more.

Farm Household: a household qualified as a farm household if it had at least \$1,000 in farm sales or owned crops and livestock valued at \$1,000 or more.

Farm Family: a farm family is one where either a husband or wife declares him or herself be a farm owner or a farm operator and meets the criteria for farm household.

Farm Operator (farmer): a person who operates a farm, either doing the work or making day-to-day decisions about such things as planting, harvesting, feeding, marketing, etc. An operator may be the owner or a member of the owner's household (husband or wife).

Off-farm Employment: the employment of husband and/or wife for a wage, in other than on-farm or own household labor, measured in hours/year or measured as a dummy variable - worked for pay off-farm, as yes/no.

Off-farm Wage Rate: annual earnings from off-farm wages and salary income divided by annual hours of off-farm wage work for husband and/or wife, in dollars/hour.

## CHAPTER 2

### REVIEW OF LITERATURE

#### Introduction

The purpose of this chapter is to review the literature related to concepts, definition, and measurements of off-farm employment, and factors which affect off-farm employment among farm households. To predict off-farm employment of farm households, it is important to define the concepts of off-farm work and understand factors that affect it. There are many economic and non-economic factors that may affect off-farm employment for farm families.

This chapter discusses the past research in the areas of off-farm employment and a range of factors affecting off-farm employment categorized as follows: a) general economic and labor market variables like wage rate, off-farm income, the economy and the market conditions, labor demand and supply situations, commuting networks which are external to the farm households; b) demographic variables like age, gender, education, marriage, children, elderly dependents; c) farm and attitude toward farm variables like farm size, farm income, farm debt and assets, farm capital, farm technology, cropping intensity, use of Extension services, farming experience, farm life satisfaction; and d) household and

attitude toward household variables like household composition, family income, family wealth.

Tweeten (1989), Doyle (1987), and Molnar et al (1989) in their studies have demonstrated that the declining profitability in farming and short-term financial crises resulting from a risky farm sector, especially for small and medium farmers, have influenced farmers to increasingly engage in off-farm work. Farmers use off-farm jobs as a temporary means of a) an extra income to supplement their farm income to sustain their farms (Oliveira, 1990), and b) augmenting decreasing profitability of small farms along with declining land values and high debt load which influence farmers to opt for dual employment. However, dual employment opportunities may be useful for small farmers in the long run as they may have the best of both sectors: to receive economic benefits from farming and off-farm work and psychological benefits from rural living (Paarlberg, 1980).

## Economic and Labor Market Factors

### Labor market conditions

Labor market conditions relate to market wage rate, demand for and supply of labor, cost of living, unemployment rate, and types of industries which have an important impact on the wage earnings of people. Effects of geographical differences on wage labor demand and wage labor participation decisions of rural couples were found to exist in an examination of Current Population Survey of



Households 1978-82 (Togle and Huffman 1991) in Iowa. Effects of local economic conditions on the probability of wage work were found to be consistent with expected market wage and reservation wage effects, and for farm households the probability of wage work was found to increase when expected farm output prices declined or the wage increased.

In their study of Georgia farm operators using new census public use micro-data, PUMS-D, to investigate the effect of local labor market characteristics on off-farm employment, Gunter and McNamara (1990) found local labor market size, unemployment rates, and industrial structure to have significant impacts on off-farm employment and earnings.

#### Wage rate differentials

Wage differentials between on-farm and off-farm sectors and labor productivity serve as the basis of all the theoretical models of labor supply. Huffman (1980) postulated that the time allocation among competing activities is a result of household utility maximization, subject to constraints on time, income, and farm production. According to Huffman, households make decisions about off-farm work simultaneously with decisions on farm inputs, including household members' farm work. Thus, off-farm labor supply is also the labor supply function less the demand function for the members' farm labor. The decisions are household decisions with associated interdependence between household members.

Huffman considers utility as a function of leisure and the composite of all purchased goods, where income is used to get goods. In the household, income is derived from farm sales, off-farm wages and salaries, and other household income and wealth. The time constraints includes work time (farm, off-farm and household) and leisure time. The farmers' decision to allocate labor to off-farm employment is influenced by off-farm wage rates of the operator and spouse, other members of the household, and the on-farm wage rate of the operator (Evenson, 1978; Gould and Saupe, 1989; Rauniar, 1985; Larson and Hu, 1977; Togle and Huffman, 1991; Summer, 1982; Huffman, 1980, and Doyle, 1987). In his study Huffman (1980) found strong substitution effects of a positive off-farm wage in terms of significant changes in farm production mix and the household consumption level of the operators when wages changed from zero wage to a positive off-farm wage.

Off-farm work depends on farmer's human capital and the local labor market. The major results in Summer's (1982) study, using a 1971 Survey of Illinois farmers, confirm the sensitivity of off-farm work to economic incentives. A 10 percent increase in the off-farm wage entailed an 11 percent increase in hours of off-farm work holding farm characteristics constant. Summer's (1982) results also indicate effects of seasonality, risk, and life cycle factors on off-farm work. For the operators participating in off-farm work, he found a quadratic age pattern peaking at forty-three years, well below the average age of farmers. This is consistent with life-cycle, labor-supply patterns and with the growth pattern of specific aspects of human capital. He confirmed his hypothesis that "those with more specialization are more

likely to work off the farm" for most farm types except for dairy farming which is characterized by low seasonality, low risk, and high technology.

Labor supply is affected by micro as well as macro level labor market characteristics both in farm and nonfarm sectors. Attempts to utilize farm household, demographic and social characteristics (such as education, human capital, age, gender, number of children, lifestyle satisfaction, farm size, health, technology, and family background) to further define off-farm employment have been productive, attributing up to 20 percent of variance to such factors (Huffman, 1984, 1985, 1991; Tokle and Huffman, 1991; Summer, 1982; Streeter, 1984; Bar-Shira and Finkelshtain, 1992; Gould and Saupe, 1989; Godwin, 1988; Knaub et al, 1988, and Wozniak, 1988).

### Commuting Costs

For most farm families, commuting to off-farm work is as much a part of the daily routine as is driving the tractor in the field or feeding the livestock. In a sample of 403 Louisiana farm couples surveyed in 1982, Deseran (1989) found that under all conditions, farm men travel greater distances to off-farm jobs than do farm women. Occupation and industry of employment of workers were found to be highly correlated with the distance men commute to off-farm work, and it had somewhat less of an effect on women's commuting. He found that the best predictor of

distance to off-farm work for men was a structural variable, occupation. For women, individual variables, especially age, were the most influential determinants.

The population classified as rural farm generally represents relative isolation and a commuting distance to off-farm employment. Commuting cost may involve costs such as transaction costs, driving costs, time costs, and opportunity costs which affect the net wage earnings in any job away from home or farm. In their study of a sample of Iowa farm households collected in 1977, Huffman and Lange (1989) found that when the off-farm wage is kept constant, a longer commute to the nearest city reduces the net wage and has the expected negative and significant effect of reducing the probability that the husband and wife work off-farm. The negative relationship between commuting cost and off-farm work is well documented in various research studies (Polzin and MacDonald, 1971; Summer, 1982; Huffman and Lange, 1989; Doyle, 1987, and Daasaran, 1989).

The significant impact of labor market conditions on off-farm employment of farm workers was also found by other researchers (Huffman and Lange, 1989; Summer, 1982). Summer (1982) explained the geographical patterns of off-farm work. He found that both northern and southern Illinois farmers had higher proportions of off-farm work than those in central Illinois. Residence in northern and southern Illinois implied higher wages relative to central Illinois. Distance from the nearest town had no impact on the wage rate, but distance from the nearest city reduced the wage rate.

## Demographic Factors

### Age

Doyle (1987) in his study of Oregon farms, found age to be significant and positively related while age-squared was negatively related to off-farm work for both wives and husbands. This implies that operator and spouse work more off-farm hours up to a peak age and then the amount of off-farm work declines. The same result was found in other farm research studies (Huffman, 1980; Streeter, 1984; Summer, 1982, and Huffman and Lange, 1989).

Huffman and Lange's findings show that the probability of off-farm work for husbands is greatest at a young age and tends to decline as they become older. For wives, there is a slightly concave life-cycle pattern. Summer (1982) found that for farm operators, irrespective of gender, off-farm work does follow a quadratic age pattern peaking at forty-three years, well below the average age of farmers.

### Gender-related factors

Reasons why women look for work outside the home can be divided into financial, social and personal motives. The need to earn an income for household or farm purposes, or both, is fundamental and may indeed be the primary reason why many women seek work outside the house. At a more personal level a woman may "need" an individual wage packet to guarantee herself some degree of

independence, more power in family decision making, and/or a measure of security for the future. Working on the farm at home will be unlikely to satisfy a woman's need for financial independence and security, and social contact (Gasson, 1984).

In her study using the regional CSRS project S-191 data from seven states on 1,159 farm families, Godwin (1988) found wives' off-farm employment status to be significantly related to their feelings about time in selected household and farm tasks. However, actual amount of time women spent at these tasks was rarely related to their feelings. In their study using a multi-state survey data involving 1,235 farm women from seven states, Draughn et al (1988) revealed that wives from small farms were more likely to carry multiple work role responsibilities. Lifestyle satisfaction was decreased by having an off-farm-work role and a parenting role, but not by a farm-work role.

Knaub et al (1988) used 1,067 husband-and-wife pairs questionnaires for their study on lifestyle satisfaction. Results suggested that employment of the farm wife in an off-farm job has a different impact on men and women. Regardless of wives' employment status, wives were more satisfied with life overall than husbands. Wozniak and Scholl (1988) using the 1985 data from the S-191 regional research project involving 1,067 couples, analyzed the couples' off-farm employment decisions. They found wives' off-farm employment most closely related to their personal characteristics (age, years of education, farm background, where the spouse grew up, farm experience, spouse's off-farm employment, and six lifestyle

satisfaction items), whereas husbands' decisions are best predicted by a combination of farm, family, and personal characteristics. They found that part-time farms are more likely to have the wife employed off the farm, thereby making the husband more responsible for the daily operation of the farm.

A paid job can be a source of status, recognition and social approval, if the job is visible and valued by the rest of society. Having a paid job can bring a woman self confidence, and personal fulfillment. Although some women find this fulfillment in farming, it is not true for all farm women. In many cases working in the home and on the farm cannot take the place of a paid off-farm job. It is unlikely to meet the women's needs for income, financial independence and security, social contact and recognition. That is, some but not all women find personal fulfillment in farm work. Among a sample of 1,000 American farm women with off-farm employment, for instance, 57 percent said that they needed the money, 18 percent wanted to get out of the house and see people for socialization, and 16 percent wished to use and keep up skills (Jones and Rosenfeld, 1981).

Gasson (1992) used two main sources of data (FBS Sample of 2,500 farms in England in 1986/87 and Women's Farm and Garden Association data using wife's contribution to 1,091 businesses in UK in the year 1989). Gasson found that older wives are more likely to run businesses from home, while younger couples and those from nonfarm backgrounds are more likely to work off the farm. He also found that on larger farms, men are less likely to work off the farm than wives. Thus, income may not be the only motive to influence wives to take off-farm or paid work.

Wives work off-farm to gain status, recognition and a sense of achievement which give them self-esteem and confidence.

### Number of Children

Presence of young children has a negative relationship with off-farm work (Gould and Saupe, 1989; Huffman, 1980; Lobao and Meyer, 1990, and Doyle, 1988). Evenson (1978) also found the child variable negatively related to off-farm work. He found that younger children increase home time and decrease market time while older children had the opposite effect in his study of Philippine households.

Somewhat similarly, Doyle (1987) in his study of 323 Oregon farm households in the Willamette Valley, found the effect of younger children on off-farm work to be slightly negative and significant for both men and women while Summer (1982) found no effect of children on off-farm work in a sample of 327 Illinois farm operators. Huffman and Lange (1989), using randomly selected Iowa farm households, found that the presence of young children (aged 6 years or less) reduces the probability of both husband and wife working off-farm. Children ages 6-11 also reduce the probability of wife's off-farm work hours, but there is no effect on husband's off-farm work. Older children (ages 12-18) do not affect either parents' off-farm work, suggesting no net effect on the reservation wage.



## Number of Adults and Elderly Dependents

The number of elderly dependents in the household negatively affects off-farm work of farm operator and spouse while number of adults (18 and older) has a positive effect on off-farm work of farm households (Doyle, 1987; Bar-Shira and Finkelshtain, 1992). Presence of elderly, non-dependent persons in the household helps the working adults with child care and supervisory tasks and releases them for more off-farm work. An increase of one working age adult in a family provides about fifty-nine additional man-days of off-farm labor per year (Larson and Hu, 1977). The Larson and Hu study refers to Taiwan where the extended family system is a norm compared to a nuclear family system in the United States, so the results are not directly comparable. This variable may not be as important in the US as it is in developing countries where the joint family system is comprised of older and retired members living together in the family. These members take care of young children and thus release parents' time for more work outside their homes. But, it is totally different in the US where older and retired members of the family generally live alone or may reside in nursing homes. In any case, the effects of a dependent person in a farm household would probably be similar, and with change in costs of health care and increased life expectancy in the US, this phenomenon may increase in future.

Huffman and Lange (1989) found a strong positive relationship between average schooling years of adults in a farm family and off-farm labor supply. This positive relationship is also found in other research studies (Evenson, 1978; Larson and Hu, 1977). The contribution of education to potential off-farm earnings exceeds its value to on-farm earnings (Simpson and Kapitany 1983). Education was not a significant variable for either operator or spouse in Doyle's study of Oregon farmers (Doyle, 1987). Huffman and Lange (1989) found that added schooling raises one's off-farm wage more for men than for women, leading to more off-farm work for men. Thus, education is noted to have positive effects on off-farm employment. The total effect of education can be seen in two ways - a direct income and substitution effects, on off-farm employment. Increase in education level increases one's skill and thus labor productivity with an increased wage rate while the indirect substitution effect is through the income effect. Once the person receives a higher wage rate, his/her total income is increased. The income may be expected to affect his/her leisure time in a positive way (decreasing work time to some degree) while the substitution effect may increase work hours. If the income effect is large, more income may increase one's leisure time and reduce off-farm work.

The coefficients of farmers' education and of Agricultural Extension programs are noteworthy in his study (Huffman 1980) of Iowa, North Carolina, and Oklahoma farms. The positive significant effect of education implies that increasing education

increases off-farm work. The operators' education elasticity of 1.2 is in addition to effects that farmers' education has on off-farm work through other included variables (e.g. farm output and off-farm wage rate). Extension's effect on off-farm work was positive but was not statistically significant (Huffman, 1980). The total effect of Extension on off-farm work is a summation of one direct and one indirect effect. The indirect effect on off-farm labor supply from increasing the Extension input, reinforces the direct effect, and a larger Agricultural Extension input has a surprising implication of inducing more off-farm work by farmers. Huffman suggests that part of the labor saved in farm production from the efficiency gain and price-induced decline of output (due to improved technology in farming, more labor is saved and it also helps in producing higher priced farm products which may be characterized by lower yield per acre of land) is reallocated to off-farm work. Price-induced decline can be in the form of lower output of high-priced farm products.

Education is also considered a proxy for recent work experience which imparts a high opportunity cost to farm work (Simpson and Kapitany, 1983). Evenson (1978) in his study of the Philippines argues that education impacts are difficult to interpret, but they appear to reflect the fact that schooling enhances one's productivity for off-farm work and possibly lowers costs associated with market work relative to home and farm work.

Education is expected to provide general human capital which is valuable both on and off the farm. Specific human capital, when measured only by a dummy variable, indicates the existence of both training and experience effects (Summer,

1982). While farm-related training (past farm work experience in terms of number of years of experience) did not reduce off-farm work, the fact of past farm experience made off-farm work much less likely. He further suggests that more on-farm specialization implies a greater incentive for off-farm work as a form of diversification (Summer 1982). Of the human capital variables, education and experience are the most important in determining the off-farm wage. An added year of schooling adds almost 4% to the hourly wage, while a further year of job experience adds almost 2% (Summer, 1982).

Simpson and Kapitany (1983) from their study of 3,430 established older farmers, suggest that as farmers become experienced in farming and as their off-farm work skills deteriorate, the effect of farm earnings begins to dominate the effect of nonfarm earnings. This supports the findings of Summer (1982) who found that off-farm work would decline with farm experience.

## Farm and Attitude Toward Farm Factors

### Farm income

Farm operators who fail to earn sufficient income from the farm enterprise often seek off-farm employment to supplement the farming income (Corlin and Ghelfi, 1979; Wilkening, 1981). Off-farm employment is an increasingly important factor in total income to farm families (Buttel, 1982), especially to farmers operating small farms (Ahearn, 1986). About three-fifths of the total income earned by farming

households came from off-farm sources (Ahearn 1986). According to him, almost a sixth of all US farming households suffered net income losses in 1984; average income generally decreased, and the share of income from nonfarm sources generally increased as household debts increased in relation to assets.

Considering current trends in technology and the general economy, Jones-Johnson et al (1991) in their study of Iowa farm households, estimated that within the next decade (1990-2000) up to 50 percent of all farms will become financially insolvent (financially not profitable, meaning that farms will lose money in their operation). The authors believe that many farm families have come to depend on off-farm employment in their struggle to maintain a reasonable standard of living as off-farm employment serves as a buffer against fluctuating farm income.

Salant et al (1986) in their study using USDA Family Farm Surveys of Mississippi-Tennessee Sand-Clay Hills and Southwestern Wisconsin found that more than 30 percent of the farm households had insufficient income to cover minimum family living expenses, cash farm operating costs, capital replacement, and principal payments on debt. Doyle (1988) in his studies of Willamette Valley farm families in Oregon has shown that earnings from farming are declining and farms are experiencing financial stress. The magnitude of this effect may not be the same everywhere but the direction of effect is the same in other states.

## Farm Size

Farm size and off-farm work are negatively related (Gasson, 1992; Salant, 1984, and Larson and Hu, 1977). Gasson in his study of UK farm households found that the larger the farm, the less likely it is that either spouse will work off the farm, this tendency being stronger for men than women. He found that women, compared to men, were less likely to diversify their businesses while being on farms. Salant (1984) in his study of North Mississippi and Southwest Tennessee farm households found over half of all farm operators and almost two-fifths of other family members age 16 and older worked off-farm and that this employment was associated with smaller farms and less labor-intensive enterprises. In a study of farm families in Illinois counties, Carlin and Ghelfi (1979) found that large farm operators were likely to devote more time to available off-farm employment opportunities than farm operators in counties characterized by smaller farms. Farm technology in the form of investment in farm machinery and other mechanized equipment explains both the positive and negative effects of land size on off-farm employment. It has been shown by research that big farms usually have higher investment in farm machinery and equipment. Technology on the farm helps big farms to displace household members' time efforts to invest in off-farm work. Small farms are not able to invest in heavy farm machinery and equipment since neither costs nor scale of equipment are feasible for them. Thus, small farms use most of their own labor to work on the

farm and may have little time to invest in off-farm work. This dual effect has also been found in other research studies.

Coughenour and Swanson (1983) find less involvement of the wife in farm work on larger farms and whenever hired farm labor is present. There is greater involvement of the wife in farm work when the farm is smaller. In this case then, an increase in farm size negatively affects the wives' labor supply for off-farm work relative to small farms that can not support as much investment in fixed farm capital and farm machinery. On small farms the husband and especially the wife do most of the farm work themselves and may have less time to work off-farm. Thus, it seems that off-farm labor supply especially of farm wives, depends upon the size of farm operation. Larger farms generally are more mechanized and may employ hired laborers to assist with or to do the work. Farm size may be specified in different ways. More popular methods include farm acreage, income, or herd size. Farm size as a variable, however, is somewhat misleading in the sense that it has been seen to have both negative and positive relationships to off-farm labor supply when mechanization of farm is taken into account. There can be various reasons for this dual effect of farm size. One of the reasons may have to do with the level of mechanization. In developing countries, where farm technologies are still very traditional, larger farms still are labor-intensive and unable to displace labor from farm to nonfarm work. It is different for developed economies of the West where mechanization plays a greater part in farming and farming is less labor-intensive.

A positive sign and statistically significant coefficient was found in Larson and Hu's 1977 study of Taiwanese farm households between stock of farm capital (which may include things like the farm equipment, farm machinery, farm structures, farm buildings) per hectare and off-farm work employment. This positive relationship means that the supply of off-farm labor is increased if more farm machinery is used on farms. Similar relationships were found in other off-farm labor research studies (Doyle, 1988; Albrecht and Murdock, 1984, and Jones-Johnston *et al.*, 1991).

Cropping intensity is an index which is measured in terms of number of crops grown per unit of farmland. It is also measured as the total acreage covered under various crop rotations in a year per unit measure of farmland. If a farmer grows 3 crops per unit measure (say acre) of farmland, cropping intensity will be considered to be 3 per acre. If he grows 5 crops on his one acre farmland, the index will be considered to be 5, as five crops will mean he is farming the equivalent of 5 acres of land. It is also expressed in percentage. An index of five means a 500 percentage cropping intensity for that piece of land. The higher the cropping index, the more labor-intensive it is considered.

Larson and Hu (1977) found that among the five farming types ranked by labor intensity (rice, vegetable and tobacco, fruit, other crops, and livestock) the regression coefficients for vegetable and tobacco farms, and fruit farms were significant at a 5 percent level and had the expected negative sign. This suggests



that higher intensity crops (e.g. fruits, vegetable and tobacco) leave less time for off-farm labor than do rice farms which are less labor-intensive forms of farming. Fruits, vegetables, and many cash crops like tobacco and coffee need more labor per unit of land as compared to the growing of crops like wheat and rice. This is true for any size of farm - large, medium or small. Labor intensity in relation to type of crops has to do with the growing characteristics of a particular crop and affect off-farm labor supply.

#### Farm debt

A principal cause of financial stress affecting farm families is the constraint imposed on household consumption by farm debt (Frengley and Johnston, 1992; Lobao and Meyer, 1990; Frengley and Johnston, 1992; Simpson and Kapitany, 1983, and Keating et al, 1986). Lobao and Meyer (1990) in their study of 511 men and 485 women Ohio farmers found that those who have experienced the brunt of the recent farm crisis during 1980s, in that they operate moderate size units and have high debt to asset-ratios, report greater household adaptations and perceptions of economic hardship. Likewise, lower farm incomes and the presence of young children at home indicate greater vulnerability to crisis and change. Such households also report more household adaptations and perceived hardships.

Off-farm work by farmers is often viewed as an important way to manage the high capital investment required to establish a viable farm. This is true when an

income target, reflecting the need to meet the financial obligations of farming, is the objective (Simpson and Kapitany, 1983). According to many, economic incentive in terms of increased returns to labor in the form of higher wage rates in off-farm work, is the main driving force for off-farm labor supply (Summer, 1982; Larson and Hu, 1977; Polzin and MacDonald, 1971; Tokle and Huffman, 1991 and Huffman, 1980).

## Household and Attitude Towards Household Factors

### Farm life satisfaction

Quality of life is a global concept which denotes a person's well-being or contentment with his/her situation or experiences in life (Andrews and Withey, 1976). Quality of life is a dynamic, rather than a static concept. Any type of change affects a person's life. Economic, social, and physical changes are often associated with changes in aspirations (Inglehart and Rabier, 1986). Andrews and McKennell (1980) conceptualize satisfaction as an attitude having both an affective (feeling or emotional) component and cognitive (thinking or reasoning) component.

Gorham (1992) investigated the impact of work and family life on the quality of life of Utah dairy farm wives and husbands. She found that off-farm employment negatively affected wives' family domain satisfaction. Husbands' family relations and age were positively related to family life domain satisfaction of husbands.

Andrews and Withey (1976) conducted an extensive study which resulted in "Life 3", a generalized life satisfaction measure, as the best measure of life quality. On a seven point response scale, survey participants are requested to respond twice to the same question, "How satisfied are you with your life as a whole?". The question and method are simple, yet sensitive (Andrews and Withey, 1976). In addition, there are many life domain categories and one of them is "personal" which relates to health, work, community, standard of living, and spare time activity.

Overall life satisfaction, according to Ackerman and Paolucci (1983), does not rely heavily on satisfaction domains which are materialistic in nature. Farm work, self as a person, health, financial, family life, and leisure were satisfaction domains identified by Ackerman, Jenson, and Bailey (1991) as contributors to overall quality of life in their study of dairy farm couples.

When farm satisfaction and life satisfaction are used, the former refers to life satisfaction at the farm and the latter refers to overall life satisfaction. Walter and McKenry's (1985) findings of 237 rural and urban employed workers in Ohio did support the greater importance of work-family role integration to the life satisfaction of rural employed mothers compared to that of urban employed mothers. Variables descriptive of psychological support (i.e., family and peer support) were generally not strong predictors of life satisfaction among these rural mothers. Variables that accounted for the most variance were job-related, i.e., variables descriptive of job satisfaction or lack of job-family conflict. One of the most important results found for

life satisfaction in the rural group included working for personal as opposed to financial reasons and thus this would be a factor in minimizing any potential conflict with the husband's provider role and the need for support of others.

Coughenour and Swanson (1992) using data from a 1982 study of Kentucky farmers confirmed the Molnar's 1985's findings of subjective well-being of Alabama farmers regarding the individual and structural determinants of farmers' global well-being. The farmers' global satisfaction with life is shown to be related to his/her satisfaction with farming. Net farm income, but not total income or off-farm work time, determined farm satisfaction, while the converse was true for global satisfaction with life.

Knaub et al (1988) in their seven-state survey involving 1,067 husbands-and-wife farmer pairs investigated the effects of off-farm employment on farm families. Out of the many factors, they found that the equity and financial security factors were dimensions of lifestyle satisfaction on the farm for farmers. For those who were parents, parenthood satisfaction formed a third dimension. They also found that, regardless of wives' employment status, farm wives were more satisfied with life overall than husbands. Wives were less satisfied than husbands with equity and husbands were more satisfied with financial security than wives. Knaub et al (1988) found that neither employment status of women nor number of hours employed for paid work, were directly related to wives' perceptions of marital and life satisfaction. Rather, wives and husbands in the high-stress category, regardless of employment status, were found to have lower life satisfaction with farm life.

## Decision Making

An underlying assumption in decision-making is that persons vary because of personal or situational factors in decision-making style, including alternative identification and selection. The majority of writing in family resource management is about individual decision making in the family setting rather than interactive decision making. But, Deacon and Firebaugh (1981) has given some attention to this aspect of decision making. They explain decision making as a process of evaluation in the choice or resolution of alternatives. It is through management that subjective and objective elements of decisions involving both personal and economic benefits and costs are reconciled or, more positively, become mutually reinforcing. Price (1973) studied the possible relation between a personal factor, personality as measured by extent of self-actualization and decision-making. Evidence supported the existence of two styles. Decision-makers at lower levels of self-actualization tended to be more task-oriented than person-oriented, to need more support from persons outside the nuclear family, and to emphasize goal attainment more frequently than persons at higher levels of self-actualization.

## Home Background

Family tasks are allocated along traditional sex role lines in rural families (Larson, 1974). Stronger traditional values are also held by urban residents whose

fathers are farmers than by urban residents without a farm background (Grasmick and Grasmick, 1978). Buttel, Wilkening, and Martinson (1977) in their study of Wisconsin farm families, found that overall life satisfaction tends to be higher for conservatively oriented individuals than for individuals constantly seeking change. This is a general statement but it may have significance for Oregon farm families.

#### Household Income and Wealth

Summer (1982) in a US study and Larson and Hu in Taiwan (1977) in their studies found a significant negative relationship between total household income and the probability of off-farm work. Polzin and MacDonald (1971) in their study of Illinois farm families found that an increase in off-farm wages or a decrease in farm income is associated with more off-farm work. Most farm families found off-farm employment a productive outlet for their excess labor and a satisfactory means of increasing their total family income (Hanson and Spitze, 1974).

The negative relationship between net farm income and off-farm employment is also revealed by other research studies (Coughenour and Swanson, 1992; Godwin et al, 1991; Sanford and Tweeten, 1988; Lobao and Meyer, 1990, and Larson and Hu, 1977). The same relationship holds true for total family assets and wealth (Huffman and Lange, 1989). The total household income may also include other income such as government payments, interest income, transfer payments and inherited properties.

## Summary

For the sake of clarity and simplicity, all important factors affecting off-farm work of farm families are classified into four major categories namely 1) general economic and labor market factors, 2) demographic factors, 3) farm, and attitude toward farm factors, and 4) household, and attitude toward household, factors.

As discussed earlier, the off-farm wage rate is the most important variable which comprises the core of the microeconomic household theoretical model for this study. Wage differentials between on-farm and off-farm sectors will serve as a basis of the theoretical model of labor supply in this study. A significant and positive relationship is expected between the off-farm wage rate and off-farm work of farm households.

Other factors such as land size, commuting cost (distance), cropping intensity, farm debt, presence of young children in the household, household income and wealth, farm capital, age, and farm mechanization are generally expected to have negative relationships with off-farm work inputs of both men and women farmers in the farm households, while the effect of education, off-farm wage rate, and location of the farm (urban or rural county location) are expected to have positive relationship with off-farm work. The effects of Agricultural Extension programs offered by Oregon State University to farmers in these eight counties, unemployment rate in the individual county, farm life satisfaction, and decision making for off-farm employment are unclear from the review of literature, but are

investigated in this study. The presence of adult but not aged members in the family and vocational training are expected to have positive effects on off-farm work. The effects of labor market conditions, location factors, and gender may also vary in their effects on off-farm employment and will be investigated.

In this study, the researcher seeks to identify factors that influence Oregon farm households to allocate their time to off-farm work. There are few empirical studies in this regard which address a broad range of household factors. Those studies that exist relate prominently to the problems in the midwest region of the United States. Moreover, studies are very much limited regarding the direct relationship between off-farm work and farm life satisfaction. In this study, the roles of labor market factors like unemployment rate and urban/rural location are also investigated.

Results of this study are expected to provide more accurate information for educators, planners, counselors, businessmen, bankers and others who may provide guidance, especially to Oregon farm couples. There is a need for farm families in Oregon to understand which factors may have significant positive and negative effects upon the amount of off-farm work time they allocate for their earnings as a basis for sound work decisions.



## CHAPTER 3

### METHODOLOGY

#### Target Population

This study uses data obtained from a survey of Oregon farmers that was done in 1988-1989. The population of interest in this survey is all farms in Oregon that are owned and run by a husband and wife and that generate at least \$1,000 dollars in annual sales. There was no required minimum acreage for a farm to be considered for the survey, but the farmers were required to live on their farms. No "corporate" farms were included in the survey. Single parent (male or female households) are not included in this study as this study focuses on roles of wife and husband in the household and there are few single parent farm households in Oregon.

#### Sampling Design and Selection

A Stratified Cluster Sampling procedure was used for sample selection. Sample selection with probability proportional to size (number of farms within the county) was used. The target for the study was to collect 300 usable surveys. In

order to collect 300 usable survey, a pool of 600 names (addresses) of farmers was used.

The lists of owners of farm land in Oregon were provided by the County Assessors' offices in each of the eight randomly selected counties: Tillamook, Yamhill, Clackamas, Marion, Linn, Deschutes, Baker, and Umatilla. The lists contained names of all persons engaged in varied farm activities and deferring taxes for farm purposes. Corporate farms were deleted from the list by the researcher. Six hundred names (75 per county) were then selected using random digits from each county list. Because of a higher than expected number of ineligible farm units, an additional 400 names were drawn (see data in Appendix - A). Instead of randomly selecting sample farm households from the total farms in the state, sample population was stratified by counties. This was done based on the limited time and financial resources available to the project.

The selected farmers were first contacted by letter and then interviewed by phone. These interviews usually required one to four calls. Half of the respondents were wives and half were husbands. Whether to interview the husband or wife was also determined randomly. Questions were adjusted for gender. Initial screening questions were asked to determine eligibility for the sample. Questions were asked in order to determine work activity, and families' financial and lifestyle situation. A total of 283 farm-respondents provided "complete information" for their situations. Of these, 146 had one or more people working away from the farm.

Questionnaires were completed in two phases. The first phase was completed through telephone interview. The questionnaires were developed by the principal investigator. Oregon State University faculty members of Oregon Agricultural Experiment Station # 805, researched, pilot tested, and revised the instrument. This questionnaire sheet contained questions on the household and general farming operations for each spouse (wife as well as husband) including human capital, and demographic and household characteristics of the farm operator and spouse. It also contained information on farm, off-farm and other household income, farm debt, farm sales and fringe benefits. Specific information on off-farm work by various job categories, hours, and wage earnings was obtained. In addition to this, local labor market information, farm life satisfaction data and future expectations about off-farm work were also collected with this telephone survey.

Phase II of the questionnaire was designed to get time allocation data in farm, off-farm and household activities for a specific week covering two twenty-four hour days. This part of the questionnaire, called the Time Diary, was mailed to only those contacted who agreed to respond (a smaller number of farm households). Both spouses kept time records on pre-coded forms, and data were collected by telephone. In this study, some of this information is presented as summary statistics for farm and nonfarm time allocation data. Overall, of the 1,000 households drawn from the land owners' lists, 48 percent of the sample population did not meet the USDA's definition of a farm and 23 percent of the sample population failed to provide information on key questions. Finally, the usable sample size was reduced

to 283 farm observations. Observations for farm operators, both wife and husband (566 individuals) were obtained for all of the important variables. Time Records were obtained from wife and husband respondents who completed the daily time allocation for all seven days in an interview-assigned week.

## Review of Theory and Methods

The classical theory of labor offers the notion that firms maximize profit and hire units of labor until the marginal cost (MC) of hiring an additional unit of labor is equal to the marginal benefit (MB) received from that additional unit. MC includes wages paid and benefits. The commonly used labor supply theory is viewed in a utility maximization context similar to profit maximization theory. Under this theory, a person releases the use of time with the expectation of receiving compensation of monetary and nonmonetary benefits, where market wage is dependent on the labor supply and demand schedules of a labor market.

In a study on nonfarm employment, Oliveira (1990) used "nonfarm work status" as the qualitative dependent variable (also referred to as a dummy variable). He used a logistic multiple regression model, utilizing the maximum likelihood technique to estimate factors affecting nonfarm work status of farm workers in 1987.

Drawing on the works of Polzin and MacDonald (1971), Larson and Hu (1977) used the equilibrium model of off-farm and farm work allocation and wage rate. Polzin and MacDonald (1971) used marginal and optimization process

concepts as a framework for the examination of the allocation of time between on and off-farm work in agriculture. They relied on the optimization rule which predicts that the people in agriculture will allocate their time so that the marginal revenue product of farm work is just equal to the net wage paid for nonagricultural employment in manufacturing as a proxy for demand for off-farm jobs.

Labor supply can be viewed in a utility maximization context similar to the profit maximization theory most commonly used. Utility maximization theory of labor supply means that the individual foregoes the use of time with the expectation of being compensated with money income and nonmonetary benefits. The prevailing market wage is dependent on the labor supply and labor demand schedules of a labor market. According to Mansfield (1982), the individual's labor supply function is dependent on the individual's demand for leisure. A person with a strong demand for leisure will offer less labor time to the market at a given wage rate than a person with a weaker demand for leisure.

Tokle and Huffman's (1991) econometric model consists of two labor demand and two wage participation equations. The empirical specification of the labor demand equations are similar for married males and females. The natural logarithm of an individual's real wage is expressed as a function of his (her) own human characteristics - experience, education, race - and job/local conditions that are potential sources of geographical wage differentials. The last group of variables includes sets of variables for local labor market, cost of living, and represents

regional dummy variables. A time trend and sample selectivity variables are also included in each equation.

### Why Use Tobit Procedure for Off-farm Labor Supply ?

In this section, the merits and demerits of selected variables and the most efficient estimation techniques are suggested for use in the proposed analysis. OLS estimation methods generate biased estimate for censored and truncated distribution (Amemiya, 1985).

There are numerous choices for dependent variables in an off-farm employment study. Some of the examples are: number of days worked off-farm in a year; number of hours worked in a year. Other efforts have addressed the decision to work off-farm as a binary choice dependent variable, ignoring the amount of time allocated. In the following paragraphs, the relevant measurement and estimation techniques are described with the problems associated with these techniques and the possible statistical solutions for them. Finally, an effort is made to assure the most appropriate form of the dependent variable and the most efficient estimation technique.

Many authors have used OLS estimation techniques (Larson and Hu, 1977; Wozniak and Scholl, 1988; Huffman, 1980; Evenson, 1982; Hanson and Spitze, 1974). However, only those who worked off-farm were used in their samples. Those found not working off-farm were excluded from the sample population. The use of

the OLS model is appropriate only if the analyst is interested only in the result of the population that worked off-farm.

The zero values observed in the dependent variable for those who did not work off-farm will be highly correlated with the error term in the OLS method. Having zeros for the dependent variables for part of the sample observation is a case of censored data. When the dependent variable is censored, values in a certain range are all transformed to (or reported as) a single value. The use of a binary choice dependent variable such as in the logit or probit model will not allow one to make use of all the information observed. With censored data, a method that uses all of the information and generates unbiased estimates is the Tobit model.

#### Tobit Model

With the Tobit model, the full range of information from the dependent variable (i.e. the number of hours as well as the binary choice for off-farm labor supply) can be used in the estimation. Off-farm labor supply studies generally involve both participants and nonparticipants. The Tobit likelihood function is as follows (Kmenta, 1986):

$$L = \sum \{ (1 - Z_i) \log F[(\beta X_i)/\sigma] + Z_i [-1/2 \log(2\pi\sigma^2) - 1/2 \sigma^2(Y_i - \beta X_i)^2] \}$$

where  $Z_i$  equals one for those who work off-farm and zero otherwise,  $Y_i$  is the number of hours worked off-farm,  $X_i$  is a vector of independent variables,  $\beta$  is a vector of parameters, and  $\sigma$  is the standard deviation of a normally distributed error term. This equation is estimated using Maximum Likelihood Estimation.

### Heckman's Two-Stage (Selection Bias-Corrected Regression) and Tobit MLE Procedures

Deaton and Muellbauer (1983) describe two other problems with truncated data sets that have missing observations of some independent variables for those who do not work off-farm. The first problem is described as sample selection bias when labor supply functions are estimated from cross-sectional data. This is the problem when only part of the sample works. The second problem involves predicting values for missing observations. There is no wage information for those people who do not work off-farm. The Tobit procedure is one method for generating unbiased estimates. Another procedure is Heckman's two-step procedure, also called selection bias-corrected regression. In the Tobit procedure, both the participation decisions and the number of hours worked, are estimated simultaneously. In comparison, the Heckman's procedure estimation these two decisions are estimated in two steps.

These two problems can be solved using Heckman's (1979) two-step estimation procedure. Heckman's estimation technique uses Probit and OLS. With



this procedure, first a Probit model is estimated for the participation decision using the entire sample. Then, these parameter estimates are used to compute a selection bias variable for each of the observation - both those who work and those who do not. Then, finally information on all variables including the newly estimated "selection bias" variable is used to obtain estimates of the selection bias-corrected regression equation (Killingsworth, 1983).

While both the estimation procedures are appropriate for censored data for labor supply studies, the Tobit procedure is used in this study of off-farm employment of Oregon farm households.

## Summary

Traditional labor economic theory postulates that resource allocations are based on utility maximization. This framework has been introduced and expanded to describe off-farm labor allocations. It has been argued that the off-farm work participation decision is most efficiently modeled in an explicit household utility maximization theoretical framework of the number of hours supplied.

It has been argued that maximum likelihood estimation of a Tobit function is appropriate in cases where the dependent variable is observed only for a subsample of participants and when a limiting value, such as zero, is observed for non-participants.

Huffman (1980, 1984, 1989), Summer (1982), Polzin and MacDonald (1971), Lass and Gempesaw II (1992), Gronau (1977), Evenson (1982), Larson and Hu (1977), and Simpson and Kapitany (1983) have discussed off-farm labor supply models in different ways. Huffman (1980) modeled labor supply for farm operators to quantify the reallocation of farm labor to off-farm jobs. He believed that the time allocation between competing activities is a result of household utility maximization, subject to constraints on time, income, and farm production. He further believed that a household's decisions about off-farm work are made simultaneously with decisions on farm inputs, including household members' farm work. In this way, the off-farm labor supply is also the labor supply function less the demand function for the members' farm labor or an excess labor supply schedule. The decisions are household decisions with associated utility independently for each member of the household. The benefits from off-farm work are commonly measured as a wage or salary in off-farm labor studies.

According to Huffman (1980), the labor supply decision of farm household members is the result of household utility maximization subject to constraints of time, income, and farm production. Household members receive utility from members' leisure ( $L$ ), purchased goods ( $Y_1$ ), and household consumption ( $Y_2$ ) which is affected by household factors like age, education and presence of small children.

The utility function looks like:

$$U = U(L, Y_1; Y_2), \quad (U_i = \partial U / \partial_i > 0, i = L, Y_1)$$

The three constraints on resources are: 1) time endowment of members ( $T^\circ$ ), 2) household income received from members' off-farm work ( $P_1 Y_1$ ), and 3) farm production ( $Q$ ). Members will allocate their time to different activities until the marginal benefit of each activity is equal to the marginal benefits of their leisure time. Huffman's three constraint equations for time, farm production and household income look as follows:

$$T^\circ = X_1 + T_{of} + L + T_h$$

$$P_1 Y_1 = W_{of} T_{of} + P Q - W_2 X_2 + V$$

$$Q = F(X_1, X_2; X_3), \quad (f_i = \partial Q / \partial X_i > 0, i = 1, 2)$$

where,

$T^\circ$  = a vector of time spent by members

$X_1$  = time spent in farm work

$T_{of}$  = off-farm work time

$T_h$  = home production time

$L$  = leisure time

$(PQ - W_2X_2)$  = net farm income

$W_2X_2$  = total variable cost of farm output

$W_{of}$  = off-farm wage income

$V$  = other household income like transfer payment and wealth

$P_1Y_1$  = total household income of members

$Q$  = vector of farm output

$X_2$  = purchased inputs for farm production

$X_3$  = other inputs like farmers' education

$P_1$  = price vector for  $Y_1$

$P$  = expected future price of farm output

$Y_1$  = vector of purchased goods

Conditions for optimality of off-farm work variable inputs in household consumption and variable inputs in farm output production are obtained by maximizing utility equation subject to the time equation, income equation, and the production equations. According to Huffman (1980) the final labor supply function is given by:

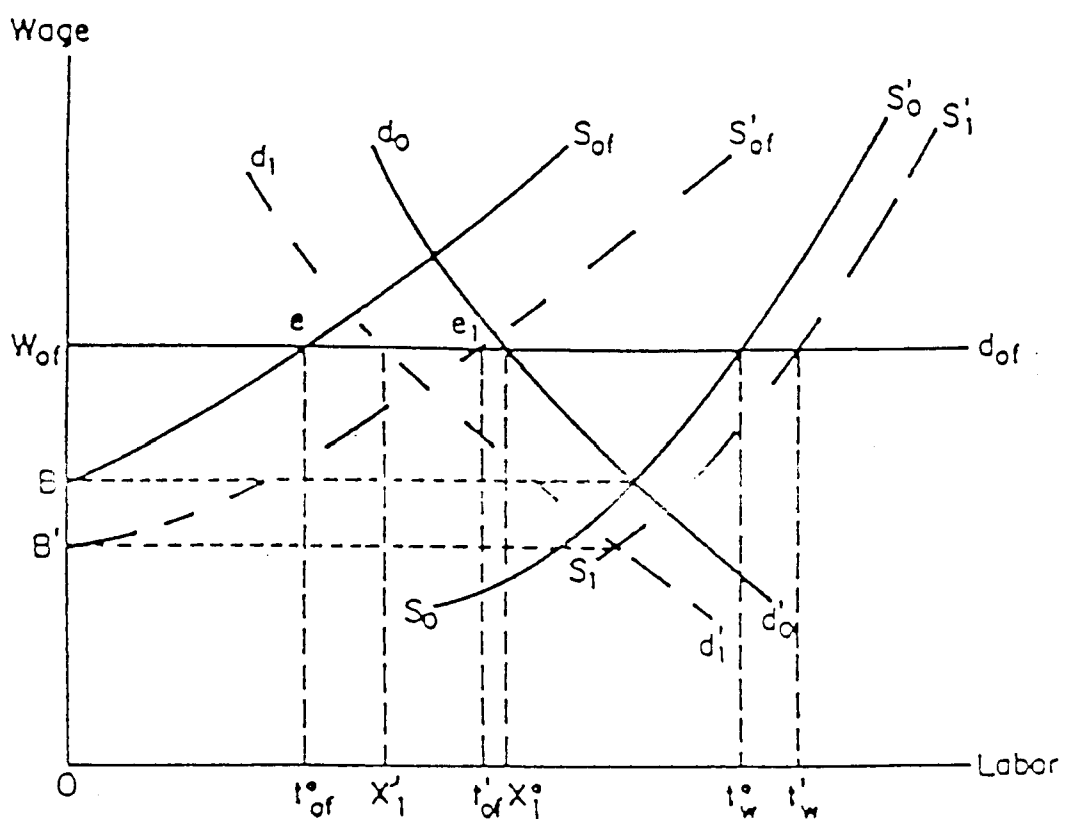
$$T_{of}^* = S_{of}(W_{of}, P_1, P, W_2, V, Y_2, X_3, T^0) \geq 0$$

where  $S_{of}$  is the off-farm labor supply function,  $W_{of}$  is the off-farm wage rate,  $W_2$  is the total variable input cost for all the farm output, and other notations are as explained above.

According to Huffman (1980), expected marginal wage rates are determinants of off-farm labor supply. As explained by his analysis, Figure-2 shows how off-farm work is determined. In this figure, the demand curve for farm work is  $d_o d'_o$ , and the supply curve of labor is  $S_o S'_o$ . Thus, the supply curve for off-farm labor (the excess supply curve) is  $BS_{of}$ . When the demand curve for off-farm labor is  $W_{of} d_{of}$ , equilibrium occurs at  $e$  and the quantity of off-farm work is  $O t_{of}^o$ . The total quantity of labor supplied is  $O t_w^o$ , and  $O X_1^o$  is the amount of farm work. If the expected price of farm output falls, the farm labor demand curve shifts leftward to, say,  $d_1 d'_1$ , and if leisure is a normal good, the supply curve of labor shifts rightward to, say,  $S_1 S'_1$ . The new off-farm labor supply curve shifts rightward to  $B' S'_{of}$ . If the demand for off-farm labor does not change, equilibrium off-farm work occurs at  $e_1$ . The quantity of off-farm and of total work increases to  $O t'_{of}$  and  $O t'_w$  respectively, and farm work declines to  $O X'_1$ .

For workers having a single job, the effect of wage rise on labor supply can be described by a positive income and a substitution effect which is unclear. A rise in wage rate causes a substitution effect in household consumption and in farm production and further increases wage work. If leisure is a normal good, the income effect due to the rise in wage rate reduces off-farm work. For other type of income change, the effect on wage work is similar. A rise in other income considering

FIGURE 2 - SUPPLY AND DEMAND FOR LABOR



leisure to be a normal good, causes a leftward shift in the household member's total supply of labor leaving the demand for farm labor unchanged. This affects a leftward shift in off-farm labor supply.

In his model, Huffman (1980) explains that the human capital variables, education and agricultural research and extension, may affect off-farm work decisions through efficiency effects. Agricultural extension may affect the productivity in farm production which may lead to upward or downward shift in demand for labor. This will depend on how much time is saved due to increased productivity which is achieved through efficiency in farm production. Net farm income increases also, and the labor supply shifts leftward if leisure is a normal good. The net effect on off-farm work is unclear. Changes in farmer's education increases the efficiency of farm as well as household production and off-farm work.

### Empirical Model

Based on the works of Huffman (1980), a reduced off-farm labor supply model is developed for household members who face options of having a wage job and a self-employed job. The labor supply decisions are treated as part of a set of joint decisions made by multiple-person farm households on inputs for household consumption and for farm production. Time allocation decisions are assumed to be made simultaneously with decisions about farm inputs, outputs, household consumption, and farm production.

In this new reduced model, an effort has been made to improve the predictability of results of the labor supply model with the addition of several important variables not tried before. Several new factors not present in Huffman's model, but added to this model, are as follows. As noted in his study, expected marginal wage rates are determinants of off-farm labor supply. He did not use this in his study as it was not available. In this model, off-farm wage rate, which is the major variable, is used to explain variation in total number of off-farm work hours. The unemployment rate in the respective county is added to the reduced labor supply model to capture the effect of labor demand at the local level. The use of this variable is expected to improve the model's performance as far as predictability of off-farm work is concerned.

Another important improvement in the model is the addition of the farm satisfaction factor. Farm satisfaction may be indirectly related to leisure time used in the Huffman's model. Leisure is measured as work opportunities forgone. But, the non-economic aspects of life satisfaction are not contained in Huffman's labor supply model. Addition of this variable is expected to give a non-economic orientation to off-farm work employment decisions based on farm life satisfaction, and improve the performance of the model.

The third important modification is the addition of a cropping intensity factor in the model. The number of farm enterprises is used as a proxy for this factor. These are related indirectly to the labor requirements on farm in the Huffman's model. These factors will capture the effect of mechanization and the total labor



requirements on the off-farm work decision of farm families in the new model.

These factors are expected to improve the performance of the model for off-farm work decisions for Oregon farm families, which is different than the midwest farm families characterized by large farm holdings. The last new factor in the model is the use of location factor as a dummy variable for urban/rural county residence. This is expected to explain the location difference of farm families and relates to off-farm work decisions.

The age factor is expected to capture the effect of farming experience to make off-farm employment decision, which is not present in Huffman's model. Age may be related in some way to education which Huffman has used in the form of human capital. The direct effect of this factor may give useful insights in understanding off-farm work decisions better for farm families which are mostly older than average. The number of years lived on farm is another variable which is used to capture the effect of farming experience on off-farm work efforts. Thus, age and the number of years lived on farms variables are used interchangeably in the separate regression models. The addition of number of young children is also expected to give additional insights in knowing better how the farm families cope with children and off-farm work decisions.

## Variable Selection

Thus, the reduced off-farm labor supply model is as follows where off-farm work is a function of:

$$L_{of} = f(WR, ED, LF, DM, CI, HI, DT, FD, AC, CH, AG, UR, EX, FS, ES, F5, MF, MN, e) \quad \text{where } e \text{ is the error term.}$$

where  $\partial L_{of} / \partial \hat{\alpha}_i > 0$  and  $i = WR, ED, LF, MN$

Where  $\partial L_{of} / \partial \hat{\alpha}_i < 0$  and  $i = CI, HI, DT, FD, AC, CH, AG, ES, F5, MF$

Where  $\partial L_{of} / \partial \hat{\alpha}_i > 0$  and  $i = UR, EX, FS, DM$

where nonfarm wage rate (WR), schooling years (ED), and location of farm either in urban or rural location (LF), and feeling toward making money in full-time nonfarm work (MN) are hypothesized to have positive effects on off-farm work hours, while number of farm enterprises (CI), landholding size (AC), presence of children (CH), other household income including government transfer payment (HI), and distance to a bank (DT), farm debt (FD), age (AG), financial situation on farm compared to five years ago (ES), how farm will do 5 years from now (F5), and feeling toward making money in full-time farming (MF) are hypothesized to have negative effects on nonfarm work hours of respondents and their spouses. The effects of unemployment rate in an individual county (UR), use of Agricultural Extension

programs offered by Oregon State University to farmers in these eight counties (EX), farm life satisfaction index (FS) on nonfarm work hours of respondents and their spouse, and decision making for off-farm employment are unclear and are also investigated in this study.

In this reduced model, off-farm labor supply (measured in man hours), is a function of the following factors measured as follows: wage rate (WR) is measured in dollars and is computed by dividing the total off-farm income in a year by the total number of hours worked in that job; age of farm operator (AG) in years; schooling years of adults (ED) used as a dummy variable where 1 means having achieved education level of more than high school and 0 means having educational level equal to high school or less than high school; use of Agricultural Extension programs offered by Oregon State University to farmers (EX) used as a dummy variable (1 and 0) where 1 means the use of OSU as a source of information for farmers and 0 means that OSU was not the source of information; farm life satisfaction (FS) dummy variable (1 and 0) computed from the questionnaires ("very satisfied", "somewhat satisfied" responses were collapsed into one and recoded as 1="satisfied" and responses of "very dissatisfied" and "somewhat dissatisfied" collapsed into another one and recoded as 0=dissatisfied).

The other variables were measured as follows: farm debt (FD) in dollars; farm size (AC) in acres; cropping index (CI) computed from the type and number of crops grown (here number of farm enterprises is used as a proxy for

cropping index which was not available in the dataset); presence of young children as dummy variable (1 and 0 response) as “if children were present” in the household (CH); other household income including government benefits in dollars and wealth in dollars (HI); unemployment rate (UR) in percentage; the location factor, i.e. the presence of a farm household in an urban or rural county (as dummy variable as 1=urban and 0=rural) was created from the recoding of the counties as urban and rural based on the proximity of that county to a urban or rural center (Clackamas, Marion, Linn, and Yamhill were categorized as 1=urban and Umatilla, Deschutes, Baker, and Tillamook as 0=rural counties); distance to a nearest bank (DT) in miles; and decision made together by discussion between wife and husband or decision made alone (DM) as a dummy variable (1=decision made together with discussion with spouse, and 0=decision made alone and without discussion with spouse).

The dependent variable ( $L_{of}$ ) is the number of off-farm work hours in terms of man hours for pay in 1988. The hypothesized signs for the explanatory variables are given above. One of the human capital factors, age (AG) is a proxy for general work experience and is expected to increase the marginal value of an individual's time in all work activities. Level of schooling whether less and equal to high school or more than high school (ED), is a proxy for human capital and is assumed to increase marginal productivity both in farm and nonfarm works. Thus, its effect on off-farm work allocation is positive.

Net farm income ( $NFI$ ) can be assumed to capture both farm size and management skills influencing farm operators to decrease off-farm time allocation. The number of farm enterprises (CI) is used in the model to capture the effects of diversity of farm operations needed to reduce uncertainty. This is used as a proxy for cropping index and was difficult to compute due to lack of sufficient information on various crops' acreage. Thus, CI is assumed to be negatively related to off-farm work. The farm enterprise (CI) is assumed to be negatively related to off-farm time allocation depending on the type of crop rotation and crop mix on the farm. The MC is a proxy for the level of mechanization at the farm. Higher mechanization helps to release more labor from farm to allocate to off-farm work. This variable (MC) is not used in the study as it was not available in the data set.

The net effect of off-farm work of the individual on his/her spouse is unknown because a spouse's off-farm income may be positively correlated with an operator's own set of exogenous off-farm work factors like age, education, and occupational preference. All other income including government benefits, employment benefits, and wealth income is expected to increase the reservation wage and thus reduce the chances of working off-farm. In this study, the distance in miles of the nearest commercial bank (DT) is used as a proxy for the distance to a nearby town.

Farm debt is assumed to represent the financial stress in the farm families. The questions of uncertainty and the feelings of how farm families will do in future or how did they do now compared to five years ago are used to capture predictions

of their future in farming and past farm and nonfarm profitability. All these variables (ES, F5, and MF) are used in the form of dummy variables as 1 and 0.

The other characteristics of local labor markets are difficult to measure precisely in a microeconomic analysis of cross-sectional sample population. Here, the unemployment rate in the respective county in that year is used as a proxy to capture the effect of labor demand for off-farm work.

### Data Analysis Procedure

Data are coded, computerized, and analyzed using the PC and Mainframe SAS 6.08 version statistical computer programs. Because this study focused on the farm couples, the data collected under Oregon Agricultural Experiment Station # 805 Project is used. There are two sources of time allocation data collected under this project. One is the Time Diary data collected with specific time allocation information on farm, off-farm, and household activities for a specified week covering seven twenty-four hour days. The other is estimates based on the records asking questions on the typical number of hours worked in primary, secondary, and other off-farm work in a week and a year. The second phase of data (weekly estimates) is used for all the statistical analysis in the study while the first phase of data are used for some of the descriptive statistics for wives and husbands.

Frequencies are used to provide descriptive information. Lifereg Procedure (Tobit Analysis) in SAS 6.08 version is used to analyze the data for empirical

results. The empirical results of only Tobit model is interpreted in the text for empirical findings and conclusions. In this study, four types of models are used each for wives and husbands. It is understood that wives and husbands make off-farm and other household decisions simultaneously but separate Tobit models are used for wives and husbands controlling for other's decisions. This is done with a view to explain the individual effects of certain variables on off-farm work decisions to account for gender difference.

A great effort was made to clean the data set for outliers as several data points were outside a realistic range. The outliers may have been due to incorrect or inflated responses of the interviewees or may have been a data entry fault. Distributions of all the major variables used in this analysis are examined for normality. Predicted and residual plots and the SAS Univariate procedures helped to understand the relationships between the dependent and the independent variables and to find the outliers.

Certain variables such as health status, and population growth in the respective counties are not included in the model as there was insufficient information or no variation. As proxy could not be obtained for certain variables listed in the theoretical model, those variables were not included in the Tobit Analysis, e.g. farm capital machinery, and number of elderly people in the household.

The number of schooling years in high school, college, university, and trade schools are added together to get the mean schooling years for each member - wife

and husband and has been used only for descriptive statistics. A dummy variable is created and coded as 1 if the number of schooling years is greater than 12 i.e. above high school, and equal to 0 if it is less than or equal to high school education. The farm enterprise variable is computed from the information available on type of crops according to the general nature of crops, length of growing season, and labor requirements for major categories of crops. The off-farm wage rate variable is computed from the total nonfarm income and the total number of hours worked in different off-farm jobs of husbands and wives. The farm life satisfaction variable has five categories of responses. This variable is a dummy for each of the categories. The “neither” response is made the “reference” category in this analysis.



## CHAPTER 4

### STUDY RESULTS

#### Introduction

This study was conducted to determine the effect of various economic and non-economic factors on off-farm employment of Oregon farmers. With this knowledge, farm couples, by understanding what factors contribute to off-farm work, may alter their aspirations or their time allocation efforts to achieve desired household income and quality of life.

This chapter includes a discussion of sample characteristics and a descriptive analysis of economic and labor market factors, demographic factors, farm and attitude towards farm factors, and household and attitude towards household factors of wives and husbands. Overall quality of life responses, work and farm life satisfaction responses are also discussed. The empirical results of Tobit Analysis are also discussed in this chapter. Of the total 283 respondents, 45 percent of the sample population ( $n=126$ ) were men (husbands) and 55 percent ( $n=157$ ) were women (wives). These were the appropriate sample sizes for attitudinal data where respondents reported their attitudinal information only for themselves and not for their spouses.

## Sample Characteristics

This study used data obtained from a survey of Oregon farmers that was done in 1988-89. The target population for this study was all farms in Oregon that were owned and run by a husband and wife and that generated at least \$1,000 in annual sales. Descriptive statistics of wives and husbands used in this study include off-farm wage, commuting cost, age, gender, number of children, education, farm income, farm size, cropping intensity, farm debt, farm life satisfaction, and household income. Tables 1 through 24 provide details on the sample characteristics. Table 25 provides the Tobit Analysis for the empirical model. Table 26 provides the summary of the most significant variables and their signs. Appendices A, B, and C provide the sample population in each county, sample population statistics in comparison with 1987 Census of Agriculture in Oregon statistics, and the sample questionnaire for wives and husbands respectively. The comparative statistics of the 1987 Census of Agriculture of Oregon and this study's sample statistics are presented in Appendix B1 and B2. Many of the sample statistics (off-farm work days, land size, farms with net loss, and distribution of crops and livestock) are consistent with the census statistics. However, there are some statistics (those not working off-farm, farm value of products sold, farms with net loss) which do not match with the census statistics. This could result from sampling and reporting error, and/or changes within a particular time period. The mean and standard

deviation of sample characteristics are summarized in Table 1a - Table 1c.

Descriptive statistics for Economic and Labor Market variables with their mean and standard deviation are presented in Table 1a while Farm and Demographic variables are presented in Table 1b and Table 1c respectively.

### Unemployment Rate

The unemployment rate in each of the counties selected in the study is presented in Table 2. The unemployment rate in these counties is used as a close proxy to capture the effect of labor demand in this study. These rates are taken from the publication reports of the Department of Human Resources, Employment Division, Labor Market Information, State of Oregon, 1987-88. The mean unemployment rate for the sample population was 8.96 percent with standard deviation of 3.50. It shows huge variation in rates among counties. Out of the eight counties included in the study, Baker County had the highest (13.6 percent) unemployment rate in 1988 followed by Linn County. Clackamas County experienced the lowest unemployment rate of 3.8 percent. Other counties which had high unemployment rates were Umatilla, Deschutes, and Tillamook. Urban counties had low unemployment rates compared to rural counties.

Descriptive Statistics for Oregon Farms  
Economic and Labor Market Variables

Economic and Labor Market Variables	N	MEAN	S.D
Numbers of years lived in the area	283	26.77	17.11
Distance (miles) to the nearby bank/business	283	7.75	9.59
Husbands total nonfarm income in a year in \$	131*	35,591.00	39,149.00
Wives total nonfarm income in a year in \$	131*	10,313.00	10,848.00
Husbands total hours worked off-farm/year	141*	1,830.99	912.26
Wives total hours worked off-farm/year	138*	1,233.87	901.90
Husbands off-farm wage rate in dollars	129*	24.16	62.45
Wives off-farm wage rate in dollars/hour	130*	8.43	6.13
Total family income in dollars	225**	56,527.00	50,807.96
Urban/Rural county	281**	0.48	0.50
Unemployment rate in 8 counties in %	8	8.96	3.50

\* Respondents with off-farm jobs reporting off-farm income

\*\* Numbers reduced because of non participation or missing data.

Descriptive Statistics for Oregon Farms  
Farm Variables in the Sample

Farm Variables	N	MEAN	S.D
Number of acres owned	280*	1,012.36	3,899.93
Additional acres rented from others	276*	515.76	2,164.35
Net farm income in dollars	283	16,714.00	39,260.86
Total value of the farm in dollars	247*	544,811.00	676,023.70
Total farm debt in dollars	265*	112,789.00	233,509.00
Farm work hours per week for women	241*	14.77	18.64
Farm work hours per week for men	245*	38.29	26.66
Household hours per week for women	241*	23.18	13.46
Household hours per week for men	245*	3.98	5.71
Number of years lived on a farm, for men	242*	39.36	18.59
Number of years lived on a farm, for women	267*	28.90	17.24
Total number of acres farmed	269*	381.00	1,288.00
Source of Information ; 1=osu 0=others	283	1.31	0.46
Decision making for off farm jobs; 1 & 0	283	0.46	0.50
Farm life satisfaction; 1=satisfied 0=other	283	0.87	0.34

\* Numbers reduced because of non participation or missing data.

Note: OSU=Oregon State University.

Note: Decision making for off-farm jobs has two levels as follows:

1=if decision made with spouse; 0=if decision made independently.

Descriptive Statistics for Oregon Farms  
Demographic Variables in the Sample

Variables	N	Mean	S.D
Number of children in the household	133*	2.07	1.13
Husbands age in years	242*	53.24	13.55
Wives age in years	267*	49.33	12.48
Husbands education in years	242*	13.48	3.48
Wives education in years	267*	13.32	3.01
If any children live in the household; 1 & 0	283	1.00	0.50

\* Numbers reduced because of missing data and/or non participants.  
Presence of children in the households; 1=if yes 0=otherwise.

## Commuting Distance

The mean distance (miles) of farm households to a nearby bank and business district was 7.75 miles with a standard deviation of 9.59 (Table 1a). The majority (84 percent) of the farm households were located within a short, comfortable distance of ten miles (Table 3). The number of miles was used as a proxy for the commuting cost of individual farmers. Thus, commuting cost of off-farm was not a big cost consideration for most farmers. Even a short distance to off-farm work will have some commuting cost in addition to other opportunity and transaction cost. But, small distances may have proved a boon for the farmers for off-farm work. There was a small number of farm households (12 percent farms) which were located at a distance between eleven to thirty miles away from a business/banking center, and 4 percent were over 30 miles from such a center.

## Urban/Rural Location of Farm Households

The location of the farm households was evenly distributed in urban and rural counties. Urban counties contained forty eight percent of the farm households compared to fifty two percent in rural counties (Table 4). Clackamas, Marion, Linn, and Yamhill were the urban counties and Umatilla, Deschutes, Baker, and Tillamook were characterized as rural counties. The definition of

Descriptive Statistics for Oregon Farms  
Unemployment Rates in Counties Included in the Study

Name of the County	Unemployment Rate in %	N Households	Urban/ Rural
Clackamas	3.80	34	Urban
Marion	5.80	37	Urban
Linn	12.00	23	Urban
Yamhill	5.40	43	Urban
Umatilla	11.90	35	Rural
Deschutes	10.30	29	Rural
Baker	13.60	50	Rural
Tillamook	9.00	32	Rural
Average	8.96	283	Urban/Rural



Descriptive Statistics for Oregon Farms  
Number of Miles the Farm is  
Away from a Nearby Bank/Business Center

Miles	Frequency	Percent
0- 5 miles	118	56.90
6 -10 miles	119	26.80
11-15 miles	15	5.30
16-20 miles	8	2.90
22-30 miles	11	3.90
31-40 miles	4	1.40
42-50 miles	6	2.10
51-67 miles	2	0.70
Totals	283	100.00

Descriptive Statistics for Oregon Farms  
 Dummy Variables for Urban/Rural Location, Presence of Children in the  
 Household, and University (OSU) as a Source of Information

Variables	Frequency	Percent
Urban County Farm Households	137	48.40
Rural County Farm Households	146	51.60
Total	283	100.00
Children living in the household	133	47.00
Children not living in the household	150	53.00
Total	283	100.00
OSU as a source of information	195	68.90
OSU not as a source of information	88	31.10
Total	283	100.00

urban and rural county was based upon the proximity of a county to a metropolitan area which is defined to contain either a central city with a minimum population of 50,000 or an urbanized area. It includes one or more central counties and may include one or more outlying counties that have close economic and social relationships with the central county (Oregon Census Abstract, July 1993).

### Decision Making for Off-farm Work

Working off-farm is a decision that can be made by husbands and wives separately or in consultation with one another. In forty-four percent of cases, wives and husbands as respondents made the decision to work off-farm alone, without any discussion with spouse (Table 5) while in fifty-six percent of the cases, wives and husbands made this decision together. In half of these cases, the wife is reporting for the husband or the vice versa. For all farm units (respondents), forty-four percent of them made this decision alone and eighteen percent made this decision with their spouse (Table 5).

When gender was taken into account, 39 percent of women and 51 percent of men said that they made this decision alone (Table 6). Forty-one percent of women and thirty-two percent of men said that they made this decision together with their spouse. Thus, men seem to make off-farm decisions

Descriptive Statistics for Oregon Farms  
 Frequency of Respondent Decision-Making  
 for Taking An Off-farm Job  
 (respondents include men and women from 283 households)

Type of responses	Households	
	N	Percent
I made it alone	100	43.00
I made with discussion with spouse	43	18.00
We made it together	87	37.00
Spouse made this decision with discussion	1	1.00
Spouse made it alone	3	1.00
Totals	234*	100.00

\* Reduced numbers are due to non-participants and/or missing data.

Descriptive Statistics for Oregon Farms  
Frequency of Men and Women Decision-Making  
for Taking An Off-farm Job

Type of responses	Men % Households	Women % Households
I made it alone	50.57 (44)	38.77 (57)
I made with discussion with spouse	17.25 (15)	20.40 (30)
We made it together	32.18 (28)	40.81 (60)
Spouse made this decision with discussion	0.00 (0)	0.01 (1)
Spouse made it alone	0.00 (0)	0.01 (2)
Total	100.00 (87)*	100.00 (150)*

Note: Figures in parentheses are the number of farm households.

\* Reduced numbers are due to non-participants and/or missing data.

more independently than their spouses. Women seem to consult their spouse more often than men (Table 6).

### Off-farm Work Hours and Reasons for Off-farm Work

Time use was a major focus of this study. Farmers who did farm work, and had an off-farm job too, had the longest work week. The men who worked 51 hours a week at their off-farm jobs, added another 22 hours of farm work, and 8 hours of household work, for an 80-hour plus work week. Women's time patterns looked different, but the work week was also high for them. The women who had off-farm jobs spent about 38 hours a week at them, spent another 6 hours on farm work, and then another 37 hours in household work for a total work week of 81 hours. When they did not have off-farm jobs, they spent more time working their farms. Men averaged 62 hours a week in farm work, women about 21. Caring for livestock, and maintaining farm equipment, buildings, and fences were the most time-consuming farm tasks for men. Women spent more time in livestock, keeping farm records and other management and paper tasks. These time use data on farm tasks were calculated from the Time Record Diary questionnaires. The work week comparison is made from estimates given to the telephone interviewer based on a Time Record Diary for the previous week. Husbands worked more hours on average in off-farm work than wives. There was also a big difference in estimated off-farm wage rates for wives and

husbands. In almost half of the farm families, both husbands and wives did not work off-farm jobs in a 12 month period.

Sixty-six percent of the respondents (both men and women combined) who worked off-farm said that they did this work as it provided them a sense of accomplishment and sixty-three percent said that it provided them basic necessities (Table 7). When gender was taken into consideration, 44 percent of women who worked gave sense of accomplishment as a reason for this work while only 23 percent of men gave this reason for off-farm employment. Forty-three percent of men and 20 percent of women said it was for basic necessities such as food, clothing, and shelter. Six percent of men and 10 percent of women said they did it as it provided them money for their children's education while the percent response was 15 and 8 percent for men and women respectively when purchasing and operating of farms were considered. Interestingly, a very small percent of men and women (4 percent men and 8 percent women) gave health insurance as a reason for off-farm work while a secure retirement was a reason for off-farm work for 9 percent of men and 11 percent of women.

Twenty-four percent of all farm wives in the sample population and eleven percent of husbands worked between 2 to 1,199 hours a year in off-farm work (Table 8). Twenty-six percent of husbands and 22 percent of wives in the sample population worked between 1,200 to 2,499 hours per year in off-farm employment. Thirteen percent of husbands and only 3 percent of wives in the sample population worked full time (over 2,500 hours per year) in off-farm work.

Descriptive Statistics for Oregon Farms  
Most Important Reasons for Off-farm Job  
(Distribution of Responses by Gender) of Respondents

Type of responses	Men (n=126) % Households	Women (n=157) % Households
It gives a sense of accomplishment	22.64 (12)	43.75 (35)
It provides basic neccessities	43.40 (23)	20.00 (16)
It gives secured retirement	9.43 (5)	11.25 (9)
It gives money for farm purchase	15.10 (8)	7.50 (6)
It gives income for children's education	5.66 (3)	10.00 (8)
It provides health insurance	3.77 (2)	7.50 (6)
Totals	100.00 (53)*	100.00 (80)*

\* Reduced number because of non-participants and/or missing data.  
Note: Figures in parentheses are the number of farm households.



Descriptive Statistics for Oregon Farms  
Off-farm Work Hours Worked in a Year for Husbands and Wives

Annual Off-farm Hours	Husbands		Wives	
	Frequency	Percent	Frequency	Percent
Did not work off-farm	142	50.20	145	51.20
2 - 1,199	31	10.90	67	23.70
1,200 - 2, 499	74	26.20	63	22.30
2,500 - 2,999	19	6.70	4	1.40
3,000 and over	17	6.00	4	1.40
Totals	283	100.00	283	100.00

The time input for off-farm work for both husbands and wives shows a large amount of work activities only for a small percentage of respondents (6 percent for husbands and 1 percent for wives where the figures are in the range of 3,000-5,616 hours per year). In the Tobit Analysis, the extreme values of off-farm work hours are not included. By excluding such extreme values, only 12 cases are lost from a sample of 283 cases. The mean annual hours of off-farm work for husbands and wives were 1,831 and 1,234 hours respectively (Table 1a). Among the type of off-farm jobs, managerial jobs topped the list followed by clerical, sales, and other professional off-farm jobs.

#### Off-farm Wage Rate

Wives were significantly different from husbands as far as off-farm wage rate was concerned. Thirty-two percent of wives received between \$0.41 to \$9.99 an hour while only 12 percent of husbands had these low wage rates (Table 9). As expected, husbands were found to be working for high paying jobs compared to wives. Twenty-eight percent of husbands in the sample population made between \$10.00 to \$35.99 an hour while only 14 percent of wives made this much an hour in off-farm work. No wife made more than \$35.99 an hour while 6 percent of men (husbands) made over \$35.99 an hour in off-farm jobs. The mean off-farm wage rate for husband was \$24.16 an hour. Wives' mean wage rate in off-farm jobs was \$8.43 an hour (Table 1a).

Descriptive Statistics for Oregon Farms  
Off-farm Wage Rate for Husbands and Wives

Off-farm Wage Rate	Husbands		Wives	
	Frequency	Percent	Frequency	Percent
Did not work off-farm	154	54.40	154	54.40
\$ 0.41 - 4.99	11	3.90	43	15.20
\$ 5.00 - 9.99	22	7.80	47	16.60
\$ 10.00 - 20.99	64	22.60	33	11.70
\$ 21.00 - 35.99	16	5.60	6	2.10
\$ 36.00 - 44.99	5	1.80	—	—
\$ 45.00 - 56.99	3	1.10	—	—
\$ 57.00 - 89.00	8	2.80	—	—
Totals	283	100.00	283	100.00

Note: Wage rate is computed. Missing off-farm income information is set to zero for computing wage rate and thus, the number of total cases differ for Table 8 and Table 9. Wage rate is computed by dividing off-farm income by number of hours worked.

## Off-farm Income

On average, husbands made \$35,591 a year from off-farm work while this was only \$10,313 a year for women (Table 1a). Fifty-four percent of wives and husbands in the sample population did not work off-farm job (Table 10). Of those who worked off-farm, 28 percent of wives and only 10 percent of husbands made \$10,000 or less in a year. Sixteen percent of husbands and wives in the sample population made between \$10,001 to \$30,000. While wives made no income more than \$50,000 in off-farm income, 7 percent of husbands made \$50,001 or more in off-farm jobs.

## Family Income

The average family income before taxes was \$56,527 per year from all sources (Table 1a). Twenty-two percent of the farm households broke even or had no positive family income (Table 11). Thirty six percent of the farm households had total annual family income between zero and \$ 20,000. One third (34 percent) of the farmers had family income of \$20,000 - \$50,000 while 14.5 percent had income in the range of \$50,001 - \$75, 000. Fourteen and half percent of the households had annual family income over \$75,000 (Table 11). Even an income level of \$20, 000 for a family of three or four members in the household is not enough to support them at a comfortable level. Only 1 percent of the households

Descriptive Statistics for Oregon Farms  
Total Non-farm Income Last Year Before Taxes  
for Husbands and Wives on Farms Where  
at Least One Spouse Worked

Non-farm Income	Husbands		Wives	
	Frequency	Percent	Frequency	Percent
Did not work off-farm	153	54.10	153	54.10
\$ 1- 5,000	18	6.30	60	21.20
\$ 5,001- 10,000	10	3.60	19	6.70
\$ 10,001- 20,000	20	7.00	31	10.90
\$ 20,001- 30,000	26	9.20	14	5.00
\$ 30,001- 50,000	37	13.10	6	2.10
\$ 50,001- 75,000	7	2.50	—	—
\$ 75,001-250,000	12	4.20	—	—
Totals	283	100.00	283	100.00

Descriptive Statistics for Oregon Farms  
Total Family Income Last Year Before Taxes

Family Income in Dollars	Frequency	Percent
fewer than zero dollars	3	1.10
Zero dollars	60	21.20
\$ 1- 10,000	6	2.10
\$ 10,001- 20,000	36	12.70
\$ 20,001- 30,000	30	10.60
\$ 30,001- 40,000	32	11.30
\$ 40,001- 50,000	34	12.00
\$ 50,001- 60,000	14	5.00
\$ 60,001- 75,000	27	9.50
\$ 75,001-100,000	14	5.00
\$ 100,001-150,000	13	4.60
\$ 150,001-200,000	8	2.80
\$ 200,001-300,000	6	2.10
Totals	283	100.00

reported that they had negative family income. This distribution of family income showed that most farmers (63 percent over \$20,000) were doing well overall, as far as total disposable income was concerned. The family income consisted of farm income, off-farm income, government payments, and other incomes such as income from interest earnings, stocks and bonds, and inherited family wealth.

### Past and Future Performance of Farming as a Profession

Fifteen percent of the farmers said that the financial condition of their farm today was either "somewhat worse" or "much worse" than it had been five years earlier. Thirty-four percent thought their farm was doing "about the same"; 31 percent said "somewhat better", and 17 percent said "much better" (Table 12). Because of the uncertain nature of the agriculture economy, it may be hard for farmers to project five years into the future. Only 3 percent said that their farm would be doing "somewhat worse" in five years while 41 percent said they would be "the same in future" (Table 12). But, 23 percent said that their farms will do much better while 33 percent said they will do somewhat better in the next five years. It was interesting to note that 62 percent of the respondents said that they could make more money in full-time nonfarm jobs while only 24 percent said that they could make more money in full-time farm jobs. Fourteen percent of the respondents predicted they would make about the same in both types of job.

Descriptive Statistics for Oregon Farms  
Comparison to Past Performance and  
Future Performance Expectations  
of Off-farm and Farm Jobs  
n=281

How are you doing now compared to five years	Percent response
much better	17%
somewhat better	31%
about the same as before	34%
somewhat worse	12%
much worse than before	3%
not farming five years ago	3%
Totals	100%
How your farm will do five years from now	Percent response
much better	23%
somewhat better in five years from now	33%
about the same as now	41%
somewhat worse than now	3%
Totals	100%
Farm/Non-farm Job Comparision	Percent response
more money in farming than in non-farm job	24%
more money in off-farm work	62%
about the same in either job	14%
Totals	100%



## Age and Number of Years Lived on Farm

The mean age for the sample population was 53 years for husbands and 49 years for wives, which means that there is an older than average population in farming in Oregon (Table 1c). Five percent of wives and only 1 percent of husbands were between the ages of 23-30 years compared to 8 percent and 6 percent for the 31-35 age group for wives and husbands respectively (Table 13). Forty-eight percent of the wives and fifty-six percent of husbands were older than 50 years. When any member of a farm household did off-farm work, the mean age for both men and women was lower than the sample population. In other words, younger farmers were more likely to take off-farm jobs. On average, husbands had lived on farms for 39 years while the wives had lived there 29 years (Table 1b). This shows long association of these family members with their farms and farm life, but longer for husbands than wives.

## Education

The mean schooling for husbands and wives was 13 years (Table 1c). Thirty-five percent of husbands and 39 percent of wives were high school graduates (12 years) in the sample population (Table 14). A very small percentage of husbands (9 percent) and wives (8 percent) had elementary and partial high school education (2-11 years). Over half of husbands (51 percent)

Descriptive Statistics for Oregon Farms  
Age Distribution of Husbands and Wives

Age Structure in Year	Husbands		Wives	
	Frequency	Percent	Frequency	Percent
23 - 30	4	1.40	13	4.60
31 - 35	17	6.10	21	7.50
36 - 40	33	11.80	37	13.20
41 - 45	31	11.10	44	15.60
46 - 50	39	13.90	32	11.40
51 - 60	79	28.20	84	29.90
61 - 70	56	20.00	40	14.20
71 - 78	21	7.50	10	3.60
Totals	280*	100.00	281*	100.00

\* Reduced number because of non-participants and/or missing data.

and wives (51 percent) had some college education or had graduated from college (13-18 years). Only a small fraction of husbands and wives had post graduate education (19-25 years). It shows that the level of education was high for both husbands and wives in the sample population.

### Oregon State University as a Source of Information

The majority of the sample farm households (69 percent) in this study used Oregon State University Extension Service as a source of information for making decisions in their farm or household operations (Table 4) while 31 percent of the households did not use this service from the university. The Agricultural Extension agent's input generally is assumed to increase the efficiency of farm production based on current information concerning technology and farm and household management. Such information is useful for farmers to make better decisions in farming and household operations.

### Number of Children

Of those who participated in this study, forty-seven percent reported that children under 18 were living in the household at the time of interview (Questionnaire # 140 based on total respondents of 283 farm households). Fifty-three percent (out of 283 respondents) of the farm households (Questionnaire #

Descriptive Statistics for Oregon Farms  
Education Levels of Husbands and Wives

Education Levels	Husbands		Wives	
	Frequency	Percent	frequency	Percent
2 - 11 years <i>(elementary &amp; partial H.S</i>	24	9.41	21	8.20
12 years <i>(high school graduate)</i>	90	35.29	100	39.06
13 - 18 years <i>some college/college graduate</i>	130	50.98	131	51.17
19 - 25 years <i>post graduate education</i>	11	4.32	4	1.57
Totals	255*	100.00	256*	100.00

\* Reduced numbers because of missing data and exclusion especially of those who only reported trade school attendance.

141) had either grown up children living away from them, or no children.

There were forty-seven percent of the farm households where at least one child lived with parents. Thirty-four percent of the households had one child living with parents (Table 15). In total, about 93 percent of the total farm households who had children living in the household (n=133) had 1-3 children living with their parents indicating high demands on their time from family (Table 4). The mean number of children in households who had children was 2.0 (Table 1c).

### Reasons for Living on Farm and Farm Life Satisfaction

Of respondents, 60 percent reported that they lived on a farm while growing up and 60 percent reported their spouses did. Obviously, ninety-nine percent of those interviewed were very positive about farming as an environment in which children can thrive (Table 16). Concern for children appears to be a strong motive for persons with off-farm jobs to undertake farming as a primary occupation. There is always something for the kids to do and that was the most important reason respondents gave for living on the farm (Meiners and Ballard, 1990). Ninety percent of the farmers agreed that "farm life gives them a sense of independence"; 89 percent agreed that "farm life gives them a sense of peace and quiet"; 97 percent agreed that "the farm is a place for the family to work together as a team"; almost (99.29 percent) all of the respondents agreed that "farm is a good place to raise children", 45

Descriptive Statistics for Oregon Farms  
Number of Children Living in the Household

Number of Children	Frequency	Percent
1	45	33.80
2	51	38.30
3	27	20.30
4	8	6.00
6	1	0.80
9	1	0.80
Totals	133*	100.00

\* Reduced number due to fact that only 133 households reported information on children.

Descriptive Statistics for Oregon Farms  
Reasons for Living on Farm  
Distribution of Responses by Gender  
n=282

Type of responses	Men Percent Households	Women Percent Households	Totals Percent Households
	(n=126)	(n=157)	(n=282)
<i>It gives a sense of independence</i>			
agree	41.84 (118)	48.23 (136)	90.07(254)
disagree	2.48 (7)	7.45 (21)	9.93 (28)
<i>It gives a sense of peace</i>			
agree	39.29 (110)	49.29 (138)	88.58 (248)
disagree	5.36 (15)	6.07 (17)	11.43 (32)
<i>It is good place to raise children</i>			
agree	43.53 (121)	55.76 (155)	99.29 (276)
disagree	0.72 (2)	0.00 (0)	0.72 (2)
<i>Good place for family work together</i>			
agree	42.85 (120)	53.93 (151)	96.78 (271)
disagree	1.79 (5)	1.42 (4)	3.21 (9)
<i>Farm provides basic neccessities</i>			
agree	18.86 (53)	25.98 (73)	44.84 (126)
disagree	25.63 (72)	29.53 (83)	55.16 (155)
<i>Farm gives financial security</i>			
agree	29.59 (79)	32.96 (88)	58.55 (167)
disagree	15.35 (41)	22.10 (59)	37.45 (100)

Note: Percentage of responses are based on total farm households reporting for each of respondent's spouse.

Note: Figures inside parentheses are responses in each category.

percent agreed that “farm provides the basic necessities”, and 59 percent agreed that “farm provides financial security”. Interestingly enough, across all categories of responses for “reasons for living on farm”, a higher percentage of women mentioned those reasons for living on farm than men (Table 16).

Distribution of responses by gender is explained in Table 17. When asked about their satisfaction with “farming as a way of life”, 90 percent of men and 87 percent of women said they were “very satisfied” or “somewhat satisfied” while 10 percent of men and 13 percent of women said they were “neither satisfied” or “dissatisfied”, or “somewhat dissatisfied” or “very dissatisfied” (Table 17). It showed both men and women were generally more satisfied than dissatisfied with farming as a way of life.

Many of the respondents (wives) who did not have positive views about farm life said that their spouses were workaholic on the farms, never took vacation and rarely did family things together, making farm life very stressful, leading to divorce or damaged family relationships (Meiners and Ballard, 1990). Many of the respondents who did not consider themselves full-time farmers also said that they were very satisfied with the success of farm operation as farming was a hobby for them and they managed it very well.



Descriptive Statistics for Oregon Farms  
Satisfaction about Farming as a Way of Life  
Distribution of Responses by Gender

Type of responses	Men (n=126) % Households		Women (n=157) % Households	
Very Satisfied	55.65	(69)	46.79	(73)
Somewhat Satisfied	33.87	(42)	39.75	(62)
Neither	0.00	(1)	8.33	(13)
Somewhat Dissatisfied	10.48	(13)	3.85	(6)
Very Dissatisfied	0.00	(1)	1.28	(2)
Total	100.00	(124)*	100.00	(156)*

Note: Figures in parentheses are the number of farm households.

\* Reduced numbers are due to non-participants and/or missing data.

## Respondents' Reported Relationship with Spouse

A quality of relationship question was asked of respondents only. The wife-husband responses to relationships with one another were given by 156 wives (99 percent of women) and 122 husbands (97 percent men). Of those who gave this assessment of their feelings about their relationship with husbands, 95 percent of wives said they were very satisfied or somewhat satisfied with the relationship with husbands while 96 percent of husbands said they were very satisfied or somewhat satisfied with their relationship with their wives. This large percentage response of satisfaction showed wives and husbands generally had good feelings about each other. A very small percent (3-4 percent) of husbands and wives had feelings of dissatisfaction about their relationship with spouses (Table 18).

## Farm Size and Number of Farm Enterprises

The average farm size was 381 acres with a standard deviation of 1,288 acres. As for landholding size, 19 percent of the farms had fewer than 20 acres of land. About 29 percent of the farms had 20-99 acres while 16 percent had farm size between 100 -199 acres. Seventeen percent of farms had land holdings between 200-999 acres. This showed that most of the farms in this study were small and medium farms (Table 19). Those who had 1,000 acres and more were characterized as large farms (19 percent). Fifty-five percent of the farmers were

Descriptive Statistics for Oregon Farms  
Respondents' Feelings about  
Relationship with One Another

Wives' feelings about relationship with husbands	(n=157)	Percent
Very satisfied	122	78
Somewhat satisfied	27	17
Neither	1	1
Somewhat dissatisfied	6	4
Very dissatisfied	0	0
Totals	156*	100
Husbands' feelings about relationship with wives	(n=126)	
Very satisfied	105	86
Somewhat satisfied	12	10
Neither	2	1
Somewhat dissatisfied	2	2
Very dissatisfied	1	1
Totals	122*	100

\* Reduced number because of non-participants and/or missing data.

involved in cattle and calves as their major farm occupation (Table 20) while 57 percent of farms were growing hay and alfalfa hay, and 59 percent of farms were involved in vegetable, fruits other than berries, and cereal crops (wheat and corn) as shown in Table 21. The average acres of land farmed by individual farm households was 715 acres. The majority of the farms were raising more than one crop per year (Table 22). Eighty-two percent of all farms raised between 1-4 crop and livestock enterprises per year (Table 21). There were farms which had between 5-8 crops and livestock enterprises every year. This showed that farmers practiced crop diversification. Crop diversification, as found in other studies (Larson and Hu, 1977), may help recover the losses from one crop while profiting from other farming operations. On average, the Oregon farmers had 3 crops/livestock enterprises each year.

### Net Farm Income

Forty-seven percent of those in this sample reported that their farm either showed a loss or broke even. Another 18 percent reported net farm income between \$33 to \$5,000. About 7 percent said that their farms had earned between \$5,001 to \$10,000 during the previous twelve months (Table 23). Eleven percent made between \$10,001 to \$30,000, and the percentage of respondents who made \$ 30,000 and above as net farm income during the last year was 18 percent (Table 23). Thus, it was evident that farming was not a very profitable profession for

Descriptive Statistics for Oregon Farms  
 Number of Total Acres Farmed by Farm Operators  
 n=279\*

Total Acres Farmed	Percent
fewer than 20 acres	19
20 - 99 acres	29
100 - 199 acres	16
200 - 499 acres	9
500 - 999 acres	8
1,000 or more acres	19
Total acres	100

\* Reduced number because of non-participants and/or missing data.

Descriptive Statistics for Oregon Farms  
Types of Livestock Raised on the Farm  
in the Past 12 Months  
Total n=222\*

Livestock type	Percent of farmers raising this animal
Cattle and calves	55
Horses and ponies	36
Sheep and lambs	17
Poultry	16
Dairy	14
Hogs and pigs	9
Goats	5
Totals	152

\* Reduced number because of non-participants and/or missing data.

(Note: This total does not sum to 100% as some farmers raise more than one type of livestock)

Descriptive Statistics for Oregon Farms  
 Type of Crops Raised by Farm Operators  
 in the Past 12 Months  
 N=203\*

Type of Crops Raised	Percent
hay (other than alfalfa)	33
alfalfa hay	24
wheat	18
vegetables, potatoes	12
fruits (other than berries)	11
barley	9
oats	9
field or grass seed	9
berries	7
nuts	7
Christmas trees	5
corn	4
nursery crops	4
vegetable seed	4
Totals	156

\* Reduced number because of non-participants and/or missing data.

(Note: This total does not sum to 100% as some farmers raise more than one type of crop)

majority of the farm households as far as net farm income was concerned. The average net farm income was \$16,714 for individual farm households (Table 1b).

### Farm Debt

The average farm debt for farm households was \$112,789 (Table 1b). Thirty-eight percent of the farms had no farm debt while 21 percent had farm debt between \$11,001 - \$50,000. Twenty-three percent of the farms had farm debt between \$50,001 - \$150,000 (Table 24). One fifth of the farm households had farm debt exceeding \$150,000 or more. Twenty percent of the farms had debt in the range of \$150,000 - \$2,000,000. It was clear from these statistics that farm debt was a problem with a potential of financial stress on these farm households. This may have influenced the farmers' response on their farms' financial performance in the future (Table 11).

### Empirical Results

Results for Tobit Analysis for husbands and wives are given in Table 25. The statistical basis for the analysis is a Chi-square test for the difference in the log-likelihood between reduced and full models (Tobin, 1958). The SAS 6.08 PC version was used for the Lifereg Procedure (Tobit Analysis). Out of the total sample of 283, 33 percent reported that neither husband nor wife had worked off the farm



Descriptive Statistics for Oregon Farms  
Number of Farm and Livestock Enterprises

Farm Enterprises	Frequency	Percent
1	56	19.9
2	73	26
3	58	20.6
4	42	14.9
5	21	7.5
6	16	5.7
7	6	2.1
8	7	2.5
10	1	0.4
11	1	0.4
Totals	281*	100

\* Reduced number because of non-participants and/or missing data.

Descriptive Statistics for Oregon Farms  
Total Net Farm Income Earned Last Year Before Taxes

Total income	Frequency	Percent
\$ < or equal to 0	132	46.60
\$ 1- 5,000	52	18.40
\$ 5,001- 10,000	20	7.10
\$ 10,001- 20,000	17	6.00
\$ 20,001- 30,000	13	4.60
\$ 30,001- 50,000	25	8.80
\$ 50,001- 75,000	11	3.90
\$ 75,001-300,000	13	4.60
Totals	283	100.00

Descriptive Statistics for Oregon Farms  
Total Farm Debt Last Year

Farm Debt in Dollars	Frequency	Percent
Zero dollars	107	37.8
\$ 1 - 10,000	8	2.8
\$ 10,001 - 20,000	17	6
\$ 20,001 - 30,000	16	5.7
\$ 30,001 - 40,000	9	3.2
\$ 40,001 - 50,000	7	2.5
\$ 50,001 - 75,000	25	8.8
\$ 75,001 - 100,000	26	9.2
\$ 100,001 - 150,000	14	4.9
\$ 150,001 - 200,000	17	6
\$ 200,001 - 270,000	10	3.6
\$ 270,001 - 400,000	10	3.5
\$ 400,001 - 850,000	14	4.9
\$ 850,001 - 2,200,000	3	1.1
Totals	283	100

for pay during the previous twelve months. In total, 52 percent of husbands and 49 percent of wives did some off-farm work. Separate Tobit results are presented for husbands and wives to capture the gender effect on off-farm employment. The total number of hours worked off-farm in a year is used as the dependent variable.

The significant variables to affect husbands' total off-farm work were off-farm wage rate, total farm debt, husband's age, urban/rural location of farm, net farm income, farm life satisfaction, and total family income before taxes. Similarly, the most significant variables to affect wives' off-farm total work hours were off-farm wage rate, wife's education, urban/rural county residence, farm life satisfaction, and total family income before taxes. The level of significance of these variables is shown by number of asterisks representing  $p \leq .0001$  to  $.10$  (Table 25). The log likelihood for normal was -832.367 for the equation for husbands and -850.199 for wives, showing the excellent fitness of the model. The pseudo  $R^2$  of 0.823 for husbands and 0.812 for wives (pseudo  $R^2 = \text{Log Likelihood} / \text{Log Likelihood} - N$ ) shows that the model explains more than 81 percent of the variation in the dependent variable. The standard pseudo  $R^2$  considered appropriate in Tobit Analysis is 0.20.

As expected, the coefficient of off-farm wage rate gave the hypothesized positive sign and was highly significant at .01 level or less for both wives and husbands. This implies that wives and husbands work more off-farm hours when their wage rate is higher. The impact of wage rate on off-farm work/year was relatively greater for women than for men. Wives were found to be more sensitive

Tobit Analysis Results for Husbands and Wives  
Dependent Variable: Off-farm Hours Worked in a Year

Independent Variables	Husbands	P-values Chi-square	Wives	P-values Chi-square
Intercept	-3915.46	0.048	1326.969	0.3955
Off-farm wage rate	18.309	0.0159**	121.3302	0.0001***
Number of years on farm	-3.4155	0.636	2.3468	0.7373
Education in years	213.732	0.3422	332.5064	0.0762*
# of farm enterprises	38.728	0.5031	42.1824	0.4066
Acres of land farmed	-0.067	0.2084	0.00238	0.9474
Total farm debt	-0.00302	0.0002***	-0.00018	0.6397
Net farm income	-0.01269	0.0066***	-0.00356	0.1596
County unemployment rate	-7.1923	0.8573	33.5158	0.3552
Urban/Rural residence	549.6898	0.0434**	565.3423	0.0202**
Age in years	195.6598	0.0064***	-4.0489	0.9454
Age in years squared	-2.24137	0.0014***	-0.4612	0.4582
Decision for off-farm job	77.2878	0.6956	-39.9824	0.8179
Distance from nearby bank	10.3992	0.3895	-9.9537	0.3336
If children live in the house	-52.3833	0.8219	-291.6151	0.1527
Farm life satisfaction D1	8.62226	0.9853	-843.7449	0.0257**
Farm life satisfaction D2	-153.382	0.7482	-660.5179	0.083*
Farm life satisfaction D4	-1006.56	0.1088*	-644.812	0.169
Farm life satisfaction D5	1299.09	0.2621	-266.0871	0.7762
Source of information - OSU	60.798	0.7957	-35.857	0.8409
Total family income last year	0.00582	0.0806*	-0.00769	0.0009***
Financial situation on farm	181.537	0.3601	-4.8196	0.9773
How farm will do in 5 years	220.957	0.2618	-174.5027	0.2996
More money: farm/off-farm D1	-265.312	0.4101	-60.5891	0.8277
More money: farm/off-farm D2	202.5253	0.5025	96.3707	0.6913
Log Likelihood for Normal		-832.367		-850.199
Pseudo R-square		0.823		0.812

\*\*\*, \*\*, \* p-values at .01, .05, and .10 levels of significance

to wage rate than husbands. Thus, women are more sensitive to wage rate differentials between farm and non-farm job markets. The mean annual off-farm hours worked was 1,831 for husbands and 1,234 for wives while the computed off-farm wage rate was \$24.16 and \$8.43 respectively. It shows that men worked for high wage off-farm jobs (about 3 times higher) compared to women. Men earned \$35,591 and women earned only \$10,313 (men nearly 4 times as much as women) on average, from nonfarm work considering both the wage rate and hours worked (Table 1a). The men were older in age than women by 4 years.

The urban/rural county residence classification of farm households (the location variable) gave a positive sign as hypothesized and was statistically significant at .05 or less, meaning that farmers closer to urban centers worked more hours in off-farm jobs. Thus, closeness to any urban or metropolitan area was a strong force affecting farmers to work more off-farm hours. This may be due to reduced commuting costs as well as the presence of more job opportunities for off-farm work near a city or urban county relative to rural county. The mere location of a farm being in an urban county contributed about 550 hours more of off-farm work compared to a farm located in a rural county for both husbands and wives per year (Table 25).

Age was significant and positive and age-square was significant and negative for husbands, as hypothesized, at .01 or less. This implies that husbands work more off-farm hours up to a peak age and then the amount of off-farm work declines (Table 25). This is also consistent with the "life-cycle" hypothesis of

consumption for a person. The Tobit coefficients do not tell at what age off-farm work hours peak as could be obtained from OLS estimates. Age as well as number of years lived on farm may reflect investment in human capital, especially in the form of farming experience, and make farmers more skilled in farm operations because of their long association with farming. Age and age-square are not significant and age gives a negative sign for women. This implies that women may prefer to work more when they are young than when they get older. Although number of years lived on a farm may be important to holding off-farm job, that finding was not evident from these data. As one of the variables used in the Tobit analysis, this variable was used to see if long association with farming affects off-farm work adversely for wives and husbands.

Education was significant at .10 level or less and positive for wives, as hypothesized, while it was positive and not significant for husbands (Table 25). This implies that the high level of education for wives was enough to increase their labor efficiency and productivity to displace their time in household and farming work in favor of more hours in off-farm jobs. Women may have a comparative advantage over men as far as household work is concerned (Becker, 1981). Almost half of the wives had 13-18 years of schooling education, which was enough for gaining vocational or other skills needed for off-farm work. Higher levels of schooling means greater investment in human capital in terms of better skill for off-farm jobs. With higher levels of schooling, whether it is college education or trade

school education, it often helps farmers to get higher paying jobs in the nonfarm sector relative to on-farm work.

The total family income (which includes wage and non-wage income such as savings, interest income, government payments, and income generated from stocks and bonds, etc.) before taxes was significant at .01 level or less and negative, as hypothesized, for wives. Any addition to total income may result in a choice for more leisure or household related time and less time devoted to off-farm or farm work for wives. In response to potentially higher income, one may work more hours or substitute leisure, or both - the net result can vary. Apparently, this was the choice for the wives. Total family income was significant at less than .10 but positive for husbands. The positive sign for total family income for husband may mean that the net effect of higher levels of wage and non-wage income and the substitution effect is positive for husbands. This implies that husbands' substitution effect is less strong than the income effect and thus they still choose to do more off-farm work.

Farm life satisfaction was significant and different from zero for both husbands and wives at .10 level or less. This variable had five levels of responses. This variable was used as a categorical dummy variable where "neither" response was set as the "reference" response and all other four categories of dummy variables are interpreted with respect to the "reference" level. D1 is very satisfied, D2 is satisfied, D4 is somewhat dissatisfied, and D5 is very dissatisfied. The farm life satisfaction (D1 and D2) dummy variables were significant at .10 or less and



negative. Compared to “neither satisfied” and/or “dissatisfied” with farming as a way of life, the more the wives were satisfied with farm life, the less they worked off-farm. This is an interesting result which implies that even in the face of low farm income, farm wives prefer to work less in off-farm work if they enjoy farm life. For a difference in farm life satisfaction from neither to either “satisfied” or “very satisfied”, there was a bigger difference in annual hours of off-farm work efforts for husbands than for wives (Table 25). For husbands, the farm life satisfaction dummy variable (D4 which means “somewhat dissatisfied”) was also significant at .10 level and was negative. This implies that “not very dissatisfied” husbands worked less in off-farm work. The farm life satisfaction dummy variable (D5 which means “very dissatisfied”) was not significant for either wives or husbands. From the descriptive statistics, this variable was found to reflect the importance of farm life in terms of reasons for living on farms. All those descriptive questionnaires reflected an overall subjective importance for being on farm and this effect was quantitatively and qualitatively confirmed by the model.

One very interesting result is seen from the highly significant total farm debt variable which is negatively related to off-farm work for husbands. This was significant at .01 level or less and negative as hypothesized in the model. It means that as farm debt increases, husbands are not motivated to take off-farm work. Even if farmers would work in an off-farm job, it might be difficult to repay such a large farm debt from off-farm income alone and switch to a new profession in the short-run. Factors that may explain this behavior for husbands include: (1) high

investment in capital, farm machinery, and other fixed costs which make it costly to reduce farm hours, (2) working less in off-farm work leaves more time for farm work to increase productivity thereby increasing total farm income as a way to repay farm debt, (3) the influence of commitment to a farm life style or lack of skills for off-farm work. The farm debt variable also had a negative coefficient for wives but was not significant. Factors that may explain this behavior for wives may include: husbands generally may make financial decisions about farm operations alone most of the time, compared to wives who make farm and household decisions in consultation with husbands.

Net farm income, considered to represent the profitability of farming as a profession, was negatively related to off-farm work for both husbands and wives, as hypothesized in the model. Net farm was highly significant at a .01 level and negative for husbands. It was negative and only significant at more than .10 level for wives. The significance of this variable means that if farmers' net farm income is higher, they are less likely to do off-farm work. More income in any form means more leisure time for family members and less time for work in nonfarm jobs.

Farm size was significant but only at a .20 level and was negative for husbands, as hypothesized. It was positive but not significant for wives. Two third of the farms in the sample population had between 1 - 500 acres of land farmed. Almost half of the farms (48 %) had fewer than 100 acres of farmed land. Reasons for low significance of farm size for husbands may have been the level of mechanization in farming, and small farm size. Farming in the United States,

including the state of Oregon, involves the use of modern farm implements.

Farming is mostly mechanized and often uses more equipment than human labor. It may be possible not to capture the full impact of the farm size variable in the model for the reason that total farm acres owned was 4 times greater than the actual land farmed by farm families. Farmers cultivate only a third of the land they own, on average. In this analysis, the land cultivated is used and not the total land owned. However, if more than a one-year time frame were considered, farm size might have a greater influence. For this study, farm size seems to have mild effect on off-farm work for husbands and none for wives.

Although, number of farm enterprises may be important to off-farm work efforts, that finding was not evident from these data. For both wives and husbands, it was not significant though positive, and did not confirm the hypothesis of a negative relationship with off-farm employment. As a cropping intensity index was not available, number of farm enterprises was used as a proxy. If available, the use of cropping intensity may have been a better indicator of the effect on farm labor demand. Other reasons for nonsignificance of the number of farm enterprises may have been the small farm size and the high level of farm mechanization, meaning that the number of farm enterprises may have little impact on off-farm employment in cases where farming may not be very labor-intensive. Total value of the farm, which includes the value of land, buildings, and farm machineries was very high for farmers in the sample.

The lack of significance attributed to distance may be that, for the most part farmers in the sample (wives and husbands) lived very close to town or cities. Nearly 84 percent of the households were located within 10 miles of a town and only 16 percent lived more than 10 miles away. This lack of variation could be avoided by deliberately overcomparing farms that are isolated from urban areas. While distance was negative for wives and positive for husbands, it was not significant in either case.

Presence of children in the household was negative for both husbands and wives, as hypothesized, but was not significant for husbands. It was negative and slightly significant at a more than .10 level for wives. Raising children is very time-intensive. Wives generally or traditionally give more time than husbands to take care of children, and thus, have less time left for either farm or off-farm work activities. Wives work fewer hours in outside home work for pay compared to husbands. Also wives may have more experience and a comparative advantage in child rearing compared to husbands, based on past experience and socialization (Becker, 1981).

The demand for off-farm labor in the respective counties was not available in the information collected. Thus, the unemployment rate in the corresponding counties was used as a proxy for labor demand. The unemployment rate was found to have no significant effect on off-farm work. The reasons for its nonsignificance may be that the unemployment rate may not be a good measure of labor demand in a county and "county" may not be the appropriate unit of measure. Moreover,

unemployment rate is a general measure and may not account for the concentration of particular job opportunities in various sectors such as manufacturing, and service industries.

Although who makes the decisions about off-farm work, may be important to level of off-farm work, it was not significant in the study. It was positive for husbands and negative for wives. The positive sign for husbands may mean that husbands generally make off-farm decisions independently of their spouses. The negative sign for wives may mean that wives generally or traditionally make these decisions in consultation with their husbands who may directly affect work hours of their wives. Reasons for this nonsignificance may have to do with the way it was measured. It was a variable with five levels of responses. These responses were collapsed into two, making it a categorical variable with 1 and 0 the responses about decision making method. The binary response was based on the decision made jointly between wives and husbands (coded as 1) or decisions made alone (coded as 0). A better measure of the decision-making methods of wives and husbands might have been more appropriate but was not available.

Using Extension information from Oregon State University for farm or household operation, was positive for husbands and negative for wives but not significant. This variable was a dummy variable. It was not clear what other sources of information for farmers were available. The negative sign for husbands may mean that the farm production extension information on farm production and household operations from Oregon State University enhances the labor productivity

and efficiency of farmers' human capital skills and saves time in farm and household production. The saved time then may be invested in off-farm work. The negative sign for wives may mean that the Extension information from the university (OSU) is mostly utilized in the area of household production. Wives may be able to use this information to enhance their skill in household work and save more time to invest in other household activities rather than investing in off-farm work. Wives seem to work relatively more hours than husbands and household work always comprises a major share of her total work load. Although this question referred to farm or household operation, it was not clear what type of information was meant in the question when it was referred to as a source of information. This result would make more sense if one knew whether the information referred to related to home management, farm production, or household production.

Two dummy variables - financial situation on the farm compared to five years in the past, and a judgement of how the farm will do five years from now - were used in the model to measure their effects on off-farm work decisions of wives and husbands. Both of these variables had five levels of individual response which were collapsed into two levels and used as dummy variables, including "much better" and "somewhat better" as 1, and all others as 0 for both variables. Both these variables were negative for wives, as hypothesized, but were not negative for husbands. In either case these variables were not significant. The positive sign for husband and nonsignificance of these variables as a whole may have been due to measurement error.

A judgement about the potential for making money in full-time farming vs full-time off-farm job was also used as a dichotomous dummy variable with "about the same amount of money in either activity" used as D1 and D2 dummy variables. Both these dummy variables gave the expected signs but were not significant for either wives or husbands. Feelings of making more money in full-time farming (D1) was negative, as hypothesized, but was not significant for either wives or husbands while feelings of making more money in full-time off-farm work was positive. A measure of debt/asset relationship might have been more appropriate to see the effect of predicted performance of farm operations as a successful and viable activity, but was not available.

## SUMMARY

## Summary

This researcher has attempted to improve existing models of off-farm labor supply behavior of farmers by including certain non-economic variables generally not included in such studies and, especially, for farm families in Oregon. Farm life style variables were added to economic variables in an effort to explain off-farm work participation decisions of farm households. This research draws heavily from previous research using the off-farm wage rate, theorized to affect off-farm work decisions through preferences for purchased goods and leisure. This study has attempted to analyze both economic and noneconomic aspects inherent in living and working on a farm. Any labor supply study yields continuous data for participants and 0 (zero) data for nonparticipants. Mostly, researchers in social sciences have used either OLS to analyze the amount of off-farm work for participants only, or they have used the dependent variable as a dichotomous binary choice (zero-one) variable. The maximum likelihood Tobit procedure has



been considered to be one of the two most appropriate methods for estimating both the discrete as well as the continuous variables in the form of amount of hours of work by household members. The alternate procedure, as explained in Chapter 3 is the Heckman's two-stage procedure (also called selection bias-corrected regression method).

The empirical findings from the Tobit model show that the off-farm wage rate is highly significant at .01 or less and gives the expected direction for its effect on the number of off-farm hours worked. It means that the wage rate is the major motivating factor for farmers to allocate their time to off-farm work. The empirical findings from the Tobit model showed plausible directional impacts, and estimates of off-farm wage rate were highly significant. Wives' off-farm work response to off-farm wage was more elastic when compared to husbands.

The most significant variables to affect husbands' total off-farm work were total off-farm wage rate, total farm debt, husband's age, urban/rural location of farm, net farm income, age in years, age-square, farm life satisfaction, and total family income before tax. Similarly, the most significant variables to affect wives' off-farm total work hours were off-farm wage rate, education, urban/rural location of farm residence, farm life satisfaction, and total family income before tax. The level of significance of these variables ranged from .001 to .10. Some additional variables such as presence of children and acres of land farmed were significant at .15 and at .20 levels respectively for wives. Summary results for both husbands and wives are presented in Table 26.

Tobit Analysis: Off-farm Annual Work Hours  
Summary List of Significant Variables  
Husbands and Wives

Variables	Direction of Effects	
	Husbands	Wives
Off-farm wage rate in dollars	+	+
Urban/rural location of farm residence	+	+
Education level		+
Farm life satisfaction	-	-
Age in years squared	-	
Total farm debt in dollars	-	
Net farm income in dollars in a year	-	
Total family income before taxes	+	-
Age in years	+	

Note: All these variables are significant at .10 or less.

Farm life satisfaction was significant both for wives (D1 and D2) and husbands (D4) and was negatively related to off-farm work. It shows a very interesting result and implies that both wives and husbands felt attached to farm life regardless of their income from farming. A high level of satisfaction seems to lead farmers to farm life and to maintain their farm life styles. The effect of farm life satisfaction was more prominent for wives than for husbands (Table 25).

Age-square and net farm income were significantly related to off-farm work for both wives and husbands, indicating that older-aged individuals tended to work fewer off-farm work hours, while greater net-farm income was negatively related to off-farm hours. Size of farm debt was significant and negatively related to off-farm work hours for husbands. This may be due to a large investment in farming in terms of fixed costs in buildings and farm machinery which requires a full-time commitment and represents a high value of on-farm labor. Total family income was significant and negatively related to wives' off-farm work but not husbands', indicating that women may be sensitive to a choice for leisure or household work perhaps for highly labor-intensive child and household care when their total annual family income is higher. The location of the farm in close proximity to metropolitan areas (defined urban center) thus was found to increase off-farm work hours. The combination of high hourly commitment to off-farm work with simultaneous commitment to farm work may only be feasible when the two locations are close together.

Household care constraints such as presence of younger children in the household imposed restrictions on the likelihood of wives working off-farm. This suggests that small children increase the marginal utility of time spent in work at home for wives. Children at home raise the opportunity cost of married women more than the opportunity cost of married men as women may have the comparative advantage with better skills in child rearing and other household work compared to men (Becker, 1981). Farm size was negatively related to off-farm work in the case of husbands and was significant at .208 level indicating that operating larger farms may result in less time available for off-farm work. Large farms are likely to be located further from centers of non-farm employment such as in Eastern Oregon. Large farms in this study are generally located in "rural counties" and large districts further from metro areas. It is generally difficult for large farms to survive near the metro areas as such farms may have to compete for their farm labor from the pool of labor which is comparatively higher priced near metro areas because of pressures to develop land for commercial and housing purposes.

Education was positively related to off-farm work for both wives and husbands but was significant only for wives. A wife or husband who has more schooling has a higher probability of off-farm work. Additional schooling generally raises an individual's market wage by more than it raises her/his reservation wage. An increase of one year in schooling years for adults in the family was associated with higher magnitude of off-farm work hours annually (Table 25). This effect, however, pulled more strongly on females than males. Education may enhance

efficiency in farm production and farm management as well as in household operation and management, which in turn might allow farm operators to release time from farming and household production to increase off-farm work hours. This increasing efficiency in released time as a result of higher educational level may also be true for off-farm work where wives and husbands may use their released time for farm work. This effect is the summation of direct and indirect effects of education on work efficiency through time savings.

Despite a substantial incidence of low profitability and low farm income from farming (65 percent of farm households had an annual net farm income of US \$5,000 or less and 47 percent of the total farm households had either lost money in farming or broke even) and some unhappiness and hard work, many farmers seemed proud to be doing farm work. This is well expressed by a Tillamook county woman farmer who stated firmly, "If there's anything you can put in the study from us, it's this: It's going to take an act of God to get us off this property. It's a way of life that we farmers love".

### Conclusions and tentative policy implications

The empirical findings of this study may imply different or more flexible farm policies based on how farm or farmer is defined. In this study, a farm is defined as one from which \$1,000 or more of agricultural products are sold or could have been sold during the census year (USDA). However, farms can be defined according to other

criteria. One category of farm could be one which has the potential to fully support farm families economically, at least at some minimum level. For such families, farming would be considered a full-time, primary job and efforts would be made to generate maximum economic benefits to support all family members. Such farm families would allocate most of their time to raising crops and livestock.

A second category of farm could be one where the farm enterprise is self-sufficient as far as generating income is considered, meaning that these farms pay for themselves and recover the full cost of production in farming (at least break even) but are not intended to be the major source of economic support for the family. Such farms are not intended to support fully their farm families with the income they get from farming. The goal of such families might be to provide an ideal living situation for the family and also to take advantage of deferring tax on their land or farming operation.

The final category of farms might be one that is intended to “lose money” in farming as a tax hedge against income earned from another, non-farm job or other sources of income. Such farm operators would defer tax on their land and declare farm operation losses to compensate for income from other sources.

In the present study, farm or farm household is defined as one having generated at least \$1,000 in farm sales a year. This definition of farm household does not consider the farm family's motives and/or financial intentions in becoming farmers. The information provided in this study gives some explanation of reasons for working off-farm, but is not enough to distinctly differentiate the categories of

farms mentioned above. Thus, it is difficult to draw policy implications from the findings of this research, since a given policy may result in different outcomes for different type of farms.

Future research in this field should take into consideration the full range of characteristics of various farm families and farm types present in the sample population. Primary income and life-style motives for farming should be established at the outset. The following conclusions and policy implications are only tentative and should be interpreted cautiously.

The empirical results from the Tobit model explained convincing directional impacts. All of the respondents in this study identified themselves as farmers, yet off-farm wage rate, the basis of a reduced labor supply model, was a key variable, in addition to many other important variables, and confirmed the wage rate hypothesis of labor supply for off-farm employment. Farm households - both wives and husbands - were motivated to work more off-farm hours at higher levels of the off-farm wage rate.

It was interesting to note that almost half of the respondent farmers either lost money in farming or broke even, as far as net farm income was concerned. Even then, most of the farmers were very satisfied with farm life as a whole. Most of the farm households were located within ten miles or less from a nearby bank or business center. It can be said from these results that farm households might do well to maintaining their farm life style, even in the face of declining farm income,

especially if their nonfarm work opportunities are located at a comfortably short commuting distance.

The highly significant off-farm wage rate implies that, in the future, farm households may allocate more hours to off-farm work. This preference for off-farm work, in light of low net farm income, was expressed by a large number of farmers (Table 11) when asked about their future stream of income coming from off-farm employment (62 percent of farmers said that they could make more money in a full-time job in nonfarm employment than from working full-time in farming). Net farm income and farm debt were both significant and negatively related to off-farm employment, and the effect of education was significant and positive.

Many farm households do not seem to be concerned about the low income stream from farming. It may be possible that, for these farmers, farming may not be intended to be "self-sufficient". Rather, a large number of farmers are motivated to work more off-farm hours as it provides them higher wage rates than in farming but allows retention of the farm life style. One of the interesting results shows that education has a strong effect on wives' off-farm work hours, meaning they tend to work more in off-farm employment as higher levels of education help them gain higher skills (and higher wages, presumably) in market jobs. The net effect of income from wage earnings was stronger for wives than for husbands. Based upon these results, it can be argued that more investment in education to enhance skill in farm production, household production, and vocational skill for market jobs will help farm households increase their efficiency in all work arenas, and release time for



leisure depending upon what type of farms these farmers belong to. This might help the older as well as the younger farmers to maintain their farm life style and farm tradition, depending upon their true intention of getting involved in farming.

#### Recommendations for further study

As the older children of farmers were not asked questions about their interest in farming as a profession, any future studies might include these questions for research. For example, one reason for maintaining a farm may relate to vocational or life-style interests of children in college or in early stages of off-farm careers.

There were no “singles” included in this study, so data can not be generalized to all types of farm families. However, marital status and changes in marital status could easily be asked in future studies. Changes in marital status may affect a variety of factors, including off-farm work. Thus, to include single parents farm families, and to ask about changes in their marital status, may be useful to assess its potential role in perceived well-being for farm family members.

More realistic measurement of farm and life satisfaction is recommended for subsequent studies. Wives and husbands could have been interviewed separately for those variables which affect their perception of farm and life satisfaction and other economic and family life variables used in the study. This study has subjective, attitudinal information on respondents only and not on the wife and

husband as a couple. Such information on couples could be very useful to analyze the effect of such variables on off-farm employment.

The observed off-farm wage rate, as a measure of off-farm employment decisions, is recommended in subsequent studies as such data may better represent the true value of time as compared to an estimated wage rate from total off-farm income. Certain variables, e.g. cropping intensity, farm machinery, and farm capital variables were not available or there was insufficient information to use these variables in the analysis. There were certain variables included in the theoretical model for which no suitable proxies were found from county information. Only unemployment rate was included as a proxy for demand for labor in the off-farm labor market. Information on these variables could give more insights concerning the effect of off-farm work opportunities in future studies.

Future studies of this kind in Oregon should make an effort to gather detailed information on the types of occupational motivators of farm households explained earlier. Any policy implications may well depend on the types of farm households present in the sample population. This could make a big difference in interpreting the empirical results of the study depending whether the majority of farm households are fully “self-sufficient”; have a secondary source of income/investment; run an intentionally “income deficit operation”; and/or are “full-time”, or “part-time” farm households in some real sense of the definition of farms in Oregon. In fact, a major contribution would be to develop discrete and meaningful definition of various farm types in Oregon. In relation to data analysis, the Tobit procedure is an improvement

over other estimation procedures for censored data, especially OLS, and it offers flexibility in analyzing binary choice as well as continuous variables, such as time allocation for off-farm work.

Current trends include a decrease in number of farm households, decreasing landsize pattern, low farm income, and low profitability in farming in Oregon (1992 Oregon Census of Agriculture). It would be interesting to know why these trends are taking place in the Oregon farm sector and, especially, as basis for future developments. Thus, there is a need to investigate such trends in future studies.

## BIBLIOGRAPHY

- Ackerman, N., Jenson, G., and Bailey, D. (1991). "Domains Explaining the Life Quality of Dairy Farm Couples.", Lifestyles: Family and Economic Issues, Vol. 12, No. 2.
- Ackerman, N., and Paolucci, B. (1983). "Objective and Subjective Income Adequacy: Their Relationship to Perceived Life Quality Measures.", Social Indicators Research, Vol. 12, No. 1, pp. 25-28.
- Ahearn, M. (1986). "Off-farm Income and Labor Allocation of Farm Operator Households", paper presented at American Agricultural Economics Association Annual Meeting, Reno, NV.
- Albracht, D.E., and Murdock, S.H. (1984). "Toward a Human Ecological Perspective on Part-time Farming.", Rural Sociology, Vol. 40, No. 3, pp. 389-411.
- Amemiya, Takeshi. (1985). "Advanced Econometrics.", Cambridge, MA: Harvard University Press.
- Andrews, F.M., and McKennell, A.C. (1980). "Measures of Self-reported Well-being: Their Affective, Cognitive, and other Components.", Social Indicators Research, Vol. 1.
- Andrews, F.M., and Withey, S.B. (1976). "Social Indicators of Well-being: America's Perceptions of Life Quality.", New York, NY: Plenum Press.
- Ballard, Nancye; and Meiners, Jane. (1990). "Family Farming in Oregon", a report of Oregon Agricultural Experiment Station (Project 805), Oregon State University, Corvallis, Oregon.
- Bar-Shira, Ziv., and Finkelshtain, Israel. (1992). "Labor on the Family Farm: A Theory Under Uncertainty - An Extension.", Journal of Agricultural Economics, Vol. 8, pp. 33-430.
- Becker, G.S. (1981), "A Treatise on the Family", Cambridge, Mass: Harvard University Press.
- Bryant, W.K., and Zick, C.D. (1991). "The Economics of Housepousery: An Essay on Household Work", a paper prepared for the Liberty Fund Conference: "Liberty, The Family and Home Production.", held in Rockford, Illinois, June 6-9, 1991.

Buttel, F.H. (1982). "The Political Economy of Part-Time Farming.", GeoJournal, Vol. 6, pp.279-287.

Buttel, F.H., Wilkening, E.A., and Martinson, O.B. (1977). "Ideology and Social Indicators of the Quality of Life.", Social Indicators Research, Vol. 4, pp. 353-369.

Carlin, T.A., and Ghelfi, L. (1979). "Off-farm Employment and the Farm Sector.", in Structural Issues of American Agriculture, pp. 270-273, Washington, D.C.: USDA, ESCS, Agricultural Economics Report No. 438.

Comstock, G. (ed.) (1987). "Is There a Moral Obligation to Save the Family Farm?", Ames, IA: Iowa State University Press.

Coughenour, C.M., and Swanson, L. (1983). "Work Statuses and Occupations of Men and Women in Farm Families and the Structure of Farms.", Rural Sociology, Vol. 48, No. 1.

Coughenour, C.M., and Swanson, L. (1992). "Determinants of Farmers' Satisfaction with Farming and with Life: A Replication and Experience.", South Rural Sociology Journal, Vol. 9, No. 1, pp. 45-70.

Dasaran, F.A. (1989). "Part-time Farming and Commuting: Determinants of Distance to Off-farm Work for Louisiana Farm Couples.", Research in Rural Sociological Development, Vol. 4, pp. 171-180.

Deacon, R.E. and Firebaugh, F.M. (1981). "Family Resource Management: Principles and Applications.", Boston: Allyn and Bacon.

Deaton, A., and Muellbauer, J. (1983). "Economics and Consumer Behavior", New York: Cambridge University Press.

Draughn, P.S.; Little, L.F.; Wozniak, P; Knaub, P.K.; Waaks, O., and Smith, C. (1988). "Multiple Roles, Lifestyle Satisfaction, and Marital Happiness among Farm Wives.", Home Economics Research Journal, Vol. 17, No. 1, pp.78-83.

Department of Human Resources, Employment Division, Labor Market Information (LMI), State of Oregon, 1987 and 1988 reports for individual counties.

Deseran, F.A. (1985). "Off-farm Employment and Social Networks of Louisiana Farm Couples.", Sociologia Ruralis, Vol. XXXV-2.

Doyle, D.J. (1987). "Determinants of Off-farm Labor Supply Among Farm Households in the North Willamette Valley.", unpublished MS thesis, Oregon State University, Corvallis.

- Evenson, R.E. (1978). "Time Allocation in Rural Philippine Households.", American Journal of Agricultural Economics, Vol. 60, No. 2, pp. 322-330.
- Evenson, R.E. (1982). "Time Allocation in Rural Philippines Households.", American Journal of Agricultural Economics, Vol. 60, No. 2, pp. 322-330.
- Frengley, G.A.G, and Johnston, W.E. (1992). "Financial Stress and Consumption Expectations Among Farm Households: New Zealand's Experience with Economic Liberalization.", Journal of Agricultural Economics, Vol. 43, No. 1, pp. 15-27.
- Friedberger, K. (1989). "Survival of Family", Journal of Economic History, Vol. 49, pp. 238-239.
- Gasson, Ruth. (1984). "Farm Women in Europe: Their Need for Off-farm Employment", Sociologia Ruralis, Vol XXIV-3/4, p. 216-227.
- Gasson, R. (1992). "Farmers' Wives - Their Contribution to the Farm Business.", Journal of Agricultural Economics, Vol. 43, No. 1, pp. 74-87.
- Goodwin, H.J., Jr., and Jones, L.L. (1986). "The Importance of Off-farm Income in the United States.", The Rural Sociologist, Vol. 6(4), pp. 367-385.
- Godwin, D.D; Draughn, P.S.; Little, L.F., and Marlowe, J. (1991). "Wives' Off-farm Employment, Farm Family Economic Status, and Family Relationships.", Journal of Marriage and Family, Vol. 53, No. 2, pp. 389-402.
- Godwin, D.D. (1990). "Farm Wives' Preferences, Time Allocation, and Off-farm Employment Status.", Home Economics Research Journal, Vol. 17, No. 1.
- Godwin, D.D., and Marlowe, J. (1990). "Farm Wives' Labor Force Participation and Earnings.", Rural Sociology, Vol. 55, No. 1, pp. 25-43.
- Gorham, E. Elizabeth. (1993). "Impact of Family Life and Work on Quality of Life of Utah Dairy Farm Wives and Husbands", a Ph.D dissertation, Family Resource Management Program, Human Development and Family Sciences, Oregon State University, Corvallis, Oregon.
- Grasmick, H.G., and Grasmick, M.K. (1978). "Value Oreintations of Urban Residents: A Study of Cultural Lag.", Rural Sociology, Vol. 43, pp. 367-385.
- Gronau, R. (1973). "The Intrafamily Allocation of Time: The Value of Housewives' Time", American Economic Review, September 1973, p. 634-651.

Gronau, R. (1974). "Wage Comparisons--A Selectivity Bias", Journal of Political Economy, Vol. 82, p. 1119-1143.

----- (1977). "Leisure, Home Production, and Work--the Theory of the Allocation of Time Revisited", Journal of Political Economy, Vol. 85, p. 1099-1123.

Gould, B.W., and Saupe, W.E. (1989). "Off-farm Labor Market Entry and Exit", American Agricultural Economics Association, Vol. , p. 960-969.

Green, W.H. (1990). "Econometric Analysis." New York University, MacMillan Publishing Company, New York.

Guntar, L., and McNamaras, K.T. (1990). "The Impact of Local Labor Market Conditions on the Off-farm Earnings of Farm Operators.", Southern Journal of Agricultural Economics, Vol. 22, No. 1, pp. 155-185.

Hanson, R.J., and Spitze, R.G.G. (1974). "Increasing Income of Farm Families Through Dual Employment", Agricultural Finance Review, Vol. 35, p. 59-64.

Heckman, J. (1979). "Sample Selection Bias as a Specification Error.", Econometrica, Vol. 47, pp. 153-161.

Hewlett, J.P. (1987). "The Effect of Various Management and Policy Options on the Financial Stress Situation of Oregon Grain and Cattle Producers", Unpublished M.S. Thesis, Oregon State University.

Huffman, W.E. (1980). "Farm and Off-farm Work Decisions: The Role of Human Capital", Review of Economics and Statistics, Vol. 62, p. 14-23.

Huffman, W.E., and Lange, M.D. (1989). "Off-farm Work Decisions of Husbands and Wives: Joint Decision Making", The Review of Economics and Statistics, Vol. 71, p. 471-480.

Huffman, W.E. (1984). "Off-farm Work Decisions of Husbands and Wives: Joint Decision Making."

Huffman, W.E. (1985). "Farm and Off-farm Work Decision of Husbands and Wives in Farm Households." Iowa State University, Ames, Iowa.

Huffman, W.E. (1987). "Production, Consumption, and Labor Supply Decisions of Farming Households. A Review of the Evidence for North America", a paper presented at the 10th Annual US-USSR Symposium, August 29-September 9, 1987 in the Soviet Union.

Huffman, W.E. (1976). "The Productive Value of Human Time in U.S. Agriculture.", American Journal of Agricultural Economics, Vol. 58, pp. 672-683.

Inglehart, R. and Rabier, J. (1986). "Aspirations Adapt to Situations - But Why are We Belgians 'so much' Happier than the French? A Cross Cultural Analysis of the Subjective Quality of Life.", in Frank M. Andrews (ed.), Research on the Quality of Life, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Mi.

Jones, C., and Rosenfeld, R.A. (1981). "American Farm Women: Findings from a National Survey.", Chicago, IL: NORC.

Jones-Johnson, G.; lasley, P; and Kettner, K. (1991). "Hardship and Adjustment among Farm Households in Iowa.", Research in Rural Sociology and Development.

Keating, N. and Munro, B. (1988). "Farm Women/Farm Work.", Sex Roles, Vol. 19, No. 3/4. pp. 155-168.

Kmenta, J. (1986). "Elements of Econometrics", 2nd ed. New York: Macmillan Publishing Co.

Knaub, P.K., Abbott, D., Meredith, W.H., and Parkhurst, A. (1988). "Wives Employed Off the Farm: Impact on Lifestyle Satisfaction", Home Economics Research Journal, 17(1): 20-36.

Larson, D.W., and Hu, H. Y. (1977). "Factors Affecting the Supply of Off-farm Labor Among Small Farmers in Taiwan", American Journal of Agricultural Economics, 59(3):549-553.

Lass, D.A., and Gempesaw II, C.M. (1992). "The Supply of Off-farm Labor: A Random Coefficients Approach", American Agricultural Economics Association, Vol., p. 400-411.

Lee, John E. Jr. (1980). "Allocating Farm Resources Between Farm and Nonfarm Uses".

Lobao, L.M., and Meyer, K. (1990). "Farm Change, Adaptations in Household Consumption, and Stress Among Farm Women and Men.", a paper presented at the Annual Meeting of the American Sociological Association, Washington, D.C.

Lund, P.J. (1991). "Part-time Farming: A Note on Definitions.", Journal of Agricultural Economics, Vol. 42, No. 2, pp. 196-199.



Mansfield, Edwin. (1982). "Microeconomics: Theory and Applications.", 4th edition, W.W.Morton and Company.

Marlowe, J., and Godwin, Deborah. (1988). "The Relationship of Income and Human Capital to Debt/Asset Ratio of Farm Families", Home Economics Research Journal, 17(1): 95-110.

McDonald, J., and Moffit, R. (1980). "The Uses of Tobit Analysis", Review of Economics and Statistics, Vol. 62, p. 318-321.

Meiners, Jane. (1990). "Off-farm Work Pattern and On-Farm Work Hours of Oregon Family Farmers.", a paper presented at Twenty-Fourth Pacific Northwest Regional Economic Conference, April 26-28, Bellingham, Washington.

Meiners, J., and Ballard, Nancy. (1990). "Family Farming in Oregon", a report published by the Department of Human Development and Family Sciences, Oregon State University, Corvallis, Oregon.

Molnar, J.J., and Wu, L.S. (1989). "Agrarianism, Family Farming, and Support for States Intervention in Agriculture.", Rural Sociology, Vol. 54, No. 2, pp. 227-245.

Oregon Housing and Community Services Department (July 1993), "Oregon Census Abstract: An Analysis of Changes from 1980 to 1990 for the State of Oregon, its Counties, and its Cities with a Population over 10, 000", authored by Michael F. Murphy and Karen Seidel, Salem, Oregon.

Oliveira, V.J. (1990). "Nonfarm Employment of Farm Operators, Hired Farmworkers, and Unpaid Farmworkers", United States Department of Agriculture, Economic Research Service, #624.

Olson, G.I., Xiao, J. (1993). "Effects of Relative Advantage on Time Use in Farm Families", an unpublished paper, Oregon State University, Corvallis, OR and University of Rhode Island, Kingston, RI, 1993.

Oregon Housing and Community Services Department. (1993). "Oregon Census Abstract: An Analysis of Changes from 1980 to 1990 for the State of Oregon, its Counties, and its Cities with a Population over 10, 000.", Salem, Oregon.

Paarlberg, D. (1980). "Farm and Food Policy: Issues of the 1980's.", Lincoln: University of Nebraska Press.

Perloff, J.M. (1991). "The Impact of Wage Differentials on Choosing to Work in Agriculture", American Agricultural Economics Association, 73(3): 671-681.

- Polzin, P., and MacDonald, P. (1971). "Off-farm Work: A Marginal Analysis", Quarterly Journal of Economics, Vol. 75, p. 540-545.
- Price, Dorothy Z. (1973). "Relationship of Decision Styles and Self-Actualization.", Home Economics Research Journal, Vol. 2, No. 1.
- Rauniyar, Krishna. (1985). "Non-farm Labor Supply among Tarai and Hill Districts of Nepal: A Case Study of Dang and Lalitpur", Publication #33, USAID-GTZ-HMG Research Publication Series, Kathmandu, Nepal.
- Rauniyar, Krishna. (1985). "Demand for Children in the Nepal Tarai", WINROCK-GTZ-USAID Project Research Publication # 29, Kathmandu, Nepal.
- Reinsel, B. (1991). "Farmers without Program Payments.", Agricultural Outlook.
- Ruttan, V.W. (1955). "The Impact of Urban-Industrial Development on Agriculture in the Tennessee Valley and the Southeast", Journal of Farm Economics, Vol. 37, p. 38-56.
- Salant, P; Smale, M., and Saupe, W. (1986). "Farm Viability: Results of the USDA Family Farm Survey.", Rural Development Research Report.
- Salant, P. (1984). "Farm Households and Off-farm Sector: Results from Mississippi and Tennessee.", Agricultural Economic Research Report.
- Sanford, S., and Tweeten, L. (1988). "Farm Income Enhancement Potential for Small, Part-time Farming Operations in East Central Oklahoma.", Southern Journal of Agricultural Economics, Vol. 20, No. 2, pp. 153-164.
- Scott, J.T.Jr. (1991). "Discounts on Financially-Stressed Farmland Sales in Two Counties of Northern Illinois.", Review of Agricultural Economics, Vol. 13, No. 2, pp. 277-286.
- Simpson, W., and Kapitany, M. (1983). "The Off-farm Work Behavior of Farm Operators", American Journal of Agricultural Economics, Vol. 65, p. 801-805.
- Summer, D.A. (1982). "The Off-farm Labor Supply of Farmers", American Journal of Agricultural Economics, 64(3): 499-509.
- Tobin, D.A. (1958). "Estimation of Relationships for Limited Dependent Variables", Econometrica, Vol. 26, p. 24-36.
- Tokle, J.G., and Huffman, W.E. (1991). "Local Economic Conditions and Wage Labor Decisions of Farm and Rural Nonfarm Couples", American Agricultural Economics Association, 73(3): 652-670.

Tweeten, L. (1989). "Farm Policy Analysis.", Westview Press, Boulder.

U.S. Bureau of the Census. (1990). "Statistical Abstract of the United States.", Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Commerce, Bureau of The Census. (1992). "1992 Census of Agriculture: Oregon State and County Data.", Vol 1, Part 37.

U.S. Department of Commerce, Bureau of The Census. (1987). "1987 Census of Agriculture, Oregon".

U.S. Department of Commerce, Bureau of The Census. (1982). "1982 Census of Agriculture, Oregon".

Walter, C.M., and McKenry, P.C. (1985). "Predictors of Life Satisfaction among Rural and Urban Employed Mothers: A Research Note", Journal of Marriage and the Family, 47(4):1067-1071.

Wilkening, E.A. (1981). "Farm Families and Family Farming.", in The Family in Rural Society, by R.T. Coward and W.M. Smith, Jr. (eds.), Boulder, CO: Westview Press.

Wozniak, P.J., and Scholl, K.K. (1988). "Employment Decisions of Farm Couples: Full-Time or Part-Time Farming", Home Economics Research Journal, 17(1): 10-20.

## APPENDICES

Descriptive Statistics for Oregon Farms  
Sample Population  
Counties included in the Study

County	Sample Size	Not- Available	Not- Qualified	Total Sample	Farm Households
Clackamas	34	36	56	126	3,489
Marion	37	31	56	124	2,825
Linn	23	31	67	121	2,062
Yamhill	43	27	56	126	1,794
Umatilla	35	32	62	129	1,441
Deschutes	29	36	60	125	876
Baker	50	29	51	130	678
Tillamook	32	16	80	128	390
Total	283	238	488	1,009	13,555

Comparative Statistics of 1987 Oregon Census of Agriculture Data  
and Oregon 805 AES Project Sample Population Data

Items	1987 Agriculture Census Oregon N=32,017	Oregon 805 AES Sample Total n=283
Operators Working Off-farm		
	Percent	Percent
None	36	51
1-99 days in a year	9.6	5
100-199 days in a year	10	7
200 days or more/year	39.5	37
Not reported	4.9	2
		Mean=205 days/year
Operators by Primary Occup		
	Percent	Percent
Farming	48	60
Other occupation	52	40
Farms by Size		
	Percent	Percent
1-49 acres	52.9	42
50-179 acres	22.5	27
180-499 acres	11.3	10
500-999 acres	4.9	8
1000-1999 acres	3.1	5
more than 2000 acres	5.3	8
	Mean=556 acres	Mean=1012 acres

Comparative Statistics of 1987 Oregon Census of Agriculture Data  
and Oregon 805 AES Project Sample Population Data

Items	1987 Agriculture Census Oregon, N=32,017	Oregon 805 AES Sample n=283
<u>Net Cash Return from Sales</u>		
Total farms in Oregon	32,107	283
Average net cash returns	\$9,393	\$16,714
Farms with net gains: Ave.	\$32,415	\$42,598
Farms with net loss: Ave.	\$6,168	\$4,858
Gain of -----	Percent	Percent
less than \$1,000	6.9	5
\$ 1,000-4,999	10.7	12
\$ 5,000-9,999	5.4	7
\$ 10,000-24,999	6.1	8
\$ 25,000-49,999	4.8	11
more than \$ 50,000	6.5	7
Loss of ---	Percent	Percent
less than \$ 1,000	11	7
\$ 1,000-4,999	29.1	3
\$ 5,000-9,999	11.4	0.4
\$ 10,000-24,999	6.5	2
\$ 25,000-49,999	1.2	0
moer than \$ 50,000	0.5	0
Distribution of Livestock		
Livestocks and Poultry	Percent	Percent
Cattle and calves inventory	54.7	55
Beef cows	41.8	0
Milk cows	6	14
Hogs and pigs inventory	4.6	9
Chickens	9.9	16
Sheeps and lambs	12.9	17

## Appendix C

### Wife and Husband's Survey Questionnaire



## MARRIED FEMALE FORM

First, I'd like to ask you some questions about the jobs you held last year.

Q-1: Other than the work you do on your own farm, have you worked at any other jobs for pay in the past twelve months?

YES ..... 1  
NO ..... 2



(GO TO QUESTION 27)

Q-2: We're interested first in your primary job. This is the job you spent the most hours in over the past year. What job would this be?

\_\_\_\_\_  
(FILL IN TITLE, BRIEF DESCRIPTION)

Q-3: How many weeks during the past year did you work at this job?

\_\_\_\_\_  
(WEEKS PER YEAR)

Q-4: How many hours per week did you usually work at this job?

\_\_\_\_\_  
(HOURS PER WEEK)

Q-5: Are you presently employed in this job?

YES ..... 1  
NO ..... 2

Q-6: In this job, are (were) you self-employed?

YES ..... 1  
NO ..... 2



Q-6a: Is (was) your business located in your home?

YES ..... 1  
NO ..... 2

Q-7: Does (did) this job provide any health insurance?

YES ..... 1  
NO ..... 2

Q-8: How satisfied have you been with this job? Would you say you have been very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

Q-9: Besides this primary job and your farm work, did you have any other jobs last year?

YES ..... 1

NO ..... 2



(GO TO QUESTION 19)

Q-10: How many other jobs did you have?

1 ..... 1

2 ..... 2

3 ..... 3

4 or more ..... 4

Q-11: After your primary job, which one of your other jobs took the most hours?

\_\_\_\_\_  
(FILL IN TITLE, BRIEF DESCRIPTION)

Q-12: How many weeks during the past year did you work at this job?

\_\_\_\_\_  
(WEEKS PER YEAR)

Q-13: How many hours per week did you usually work at this job?

\_\_\_\_\_  
(HOURS PER WEEK)

Q-14: Are you presently employed in this job?

YES ..... 1

NO ..... 2

Q-15: In this job are (were) you self-employed?

YES ..... 1

NO ..... 2



Q-15a: Is (was) your business located in your home?

YES ..... 1

NO ..... 2

Q-16: Does (did) this job provide any health insurance?

YES ..... 1

NO ..... 2

Q-17: How satisfied have you been with this job? Would you say you have been very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1

SOMEWHAT SATISFIED ..... 2

NEITHER ..... 3

SOMEWHAT DISSATISFIED ..... 4

VERY DISSATISFIED ..... 5

DON'T KNOW; REFUSE ..... 9

Q-18: Considering all your nonfarm jobs together, about how many hours per week did you work for pay during last year?

---

(HOURS PER WEEK)

Q-19: About how much did you earn last year from all of your nonfarm work?

---

(DOLLARS)

We're interested in knowing why people work in nonfarm jobs. I will begin by reading six reasons people have for working away from their farms. For each reason I read, would you tell me whether you strongly agree, slightly agree, slightly disagree, or strongly disagree with the statement.

The first of these reasons is

Q-20: I need my nonfarm job to provide for basic necessities such as food, clothing, and shelter. Do you strongly agree, slightly agree, slightly disagree, or strongly disagree?

STRONGLY AGREE ..... 1  
 SLIGHTLY AGREE ..... 2  
 SLIGHTLY DISAGREE ..... 3  
 STRONGLY DISAGREE ..... 4  
 DON'T KNOW; REFUSE ..... 9

The next one is

Q-21: Health insurance is one of the most important benefits of my nonfarm work. Do you strongly agree, slightly agree, slightly disagree, or strongly disagree?

STRONGLY AGREE ..... 1  
 SLIGHTLY AGREE ..... 2  
 SLIGHTLY DISAGREE ..... 3  
 STRONGLY DISAGREE ..... 4  
 DON'T KNOW; REFUSE ..... 9

{INTERVIEWER: FROM THIS POINT ON REPEAT CATEGORIES AS YOU DEEM NECESSARY}

Q-22: My work off-the-farm gives me a sense of accomplishment.

STRONGLY AGREE ..... 1  
 SLIGHTLY AGREE ..... 2  
 SLIGHTLY DISAGREE ..... 3  
 STRONGLY DISAGREE ..... 4  
 DON'T KNOW; REFUSE ..... 9

Q-23: My work off-the-farm gives us funds for a more secure retirement.

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-24: My work off-the-farm helps provide money for my childrens education.

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-25: My work off-the-farm helps us purchase and operate our farm.

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-26: Now going back, can you tell me which of these six reasons is the most important for you? Is the most important reason basic necessities, health insurance, sense of accomplishment, secure retirement, children's education, or farm purchase and operation?

BASIC NECESSITIES ..... 1  
HEALTH INSURANCE ..... 2  
SENSE OF ACCOMPLISHMENT ..... 3  
SECURE RETIREMENT ..... 4  
CHILDREN'S EDUCATION ..... 5  
FARM PURCHASE/OPERATION ..... 6  
DON'T KNOW; REFUSE ..... 9

Next, we would like to ask you some questions about the jobs your husband held last year.

Q-27: Other than the work done on the farm, has your husband worked at any other jobs for pay in the past twelve months?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

(GO TO QUESTION 46)

Q-28: We're interested first in his primary job. This is the job he spent the most hours in over the past year. What job would this be?

---

(FILL IN TITLE, BRIEF DESCRIPTION)

Q-29: How many **weeks** during the past year did he work at this job?

(WEEKS PER YEAR)

Q-30: How many **hours per week** did he usually work at this job?

(HOURS PER WEEK)

Q-31: Is he presently employed in this job?

YES ..... 1  
NO ..... 2

Q-32: In this job, is (was) he self-employed?

YES ..... 1  
NO ..... 2

Q-32a: Is (was) his business located in your home?

YES ..... 1  
NO ..... 2

Q-33: Does (did) this job provide any health insurance?

YES ..... 1  
NO ..... 2

Q-34: How satisfied has he been with this job? Would you say he has been very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

Q-35: Besides this primary job and farm work, did your spouse have any other jobs last year?

YES ..... 1  
NO ..... 2

(GO TO QUESTION 45)

Q-36: How many other jobs did he have?

1 ..... 1  
2 ..... 2  
3 ..... 3  
4 OR MORE ..... 4  
DON'T KNOW; REFUSE ... 9

Q-37: After his primary job, which one of his other jobs took the most hours?

(FILE IN TITLE, BRIEF DESCRIPTION)

Q-38: How many **weeks** during the past year did he work at this job?

\_\_\_\_\_  
(WEEKS PER YEAR)

Q-39: How many **hours per week** did he usually work at this job?

\_\_\_\_\_  
(HOURS PER WEEK)

Q-40: Is he presently employed in this job?

YES ..... 1  
NO ..... 2

Q-41: In this job, is (was) he self-employed?

YES ..... 1  
NO ..... 2

↓  
Q-41a: Is (was) his business located in your home?

YES ..... 1  
NO ..... 2

Q-42: Does (did) the job provide any health insurance?

YES ..... 1  
NO ..... 2

Q-43: How satisfied has he been with this job? Would you say he has been very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

Q-44: Considering all his nonfarm jobs together, about how many hours did your husband work per week for pay during last year?

\_\_\_\_\_  
(HOURS PER WEEK)

Q-45: About how much did he earn last year from all of his nonfarm work?

\_\_\_\_\_  
(DOLLARS)

We would now like to ask you some questions concerning your life on the farm.

Q-46: Do you live on the farm you operate?

YES ..... 1  
NO ..... 2

Q-47: How many years have you lived in the area where you presently live?

\_\_\_\_\_  
(NUMBER OF YEARS)

Q-48: What is the name of the community nearest your farm where banking is available?

\_\_\_\_\_  
(NAME OF COMMUNITY)

Q-49: How many miles is that community from your farm?

\_\_\_\_\_  
(MILES)

Q-50: While you were growing up, did you usually live on a farm?

YES ..... 1  
NO ..... 2

Q-51: Altogether, how many total years have you either lived or worked on a farm?

\_\_\_\_\_  
(YEARS)

Q-52: While your husband was growing up, did he usually live on a farm?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-53: Altogether, how many total years has your husband lived or worked on a farm?

\_\_\_\_\_  
(YEARS)

People have different reasons for living on farms. I'm going to read six possible reasons you might have for living on a farm. For each one I read, would you tell me whether you strongly agree, slightly agree, slightly disagree, or strongly disagree. The first statement is

Q-54: Farm life gives me a sense of independence. Do you strongly agree, slightly agree, slightly disagree, or strongly disagree?

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-55: Farm life gives me a sense of peace and quiet. Do you strongly agree, slightly agree, slightly disagree, or strongly disagree?

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

(INTERVIEWER: FROM THIS POINT ON REPEAT CATEGORIES AS YOU DEEM NECESSARY)

Q-56: The farm is a good place to raise children. Do you ...

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-57: The farm is a place for the family to work together as a team. Do you ...

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-58: The farm provides me with a good income. Do you ...

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

Q-59: The farm will provide me with financial security for retirement. Do you ...

STRONGLY AGREE ..... 1  
SLIGHTLY AGREE ..... 2  
SLIGHTLY DISAGREE ..... 3  
STRONGLY DISAGREE ..... 4  
DON'T KNOW; REFUSE ..... 9

OK, next we would like to ask you some questions about your satisfaction with farm life.

Q-60: How do you feel about farming as a way of life? Are you very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9



Q-61: How do you feel about your farm as a successful operation? Are you very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

Q-62: How do you feel about your life as a whole? Are you very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

Q-63: How do you feel about your relation with your husband? Are you very satisfied, somewhat satisfied, neither satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?

VERY SATISFIED ..... 1  
SOMEWHAT SATISFIED ..... 2  
NEITHER ..... 3  
SOMEWHAT DISSATISFIED ..... 4  
VERY DISSATISFIED ..... 5  
DON'T KNOW; REFUSE ..... 9

We know that farm families have different ways of sharing the work load on farms.

Q-64: If something happened to your husband, could you run the farm operation by yourself?

YES ..... 1  
MAYBE ..... 2  
NO ..... 3  
DON'T KNOW; REFUSE ... 9

Q-65: Would you have to hire someone to do his work?

YES ..... 1  
MAYBE ..... 2  
NO ..... 3  
DON'T KNOW; REFUSE ... 9

In this study we're interested in how farm families go about making decisions. I'm going to read to you four statements about typical decisions made on farms. For each statement, pick the response that best describes who made the decision. The responses are: I made the decision alone, I made the decision after I discussed it with my husband, we made the decision together, my husband made the decision after discussing it with me, or my husband made the decision alone.

Q-66: The first statement is the decision to buy or sell land. Which best describes your situation? I made the decision alone, I made the decision after I discussed it with my husband, we made the decision together, my husband made the decision after discussing it with me, or my husband made the decision alone.

I MADE ALONE ..... 1  
 I MADE WITH DISCUSSION/HUSBAND .... 2  
 WE MADE TOGETHER ..... 3  
 HUSBAND MADE AFTER DISCUSSION/ME... 4  
 HUSBAND MADE ALONE ..... 5  
 DON'T KNOW; REFUSE; NA ..... 9

Q-67: The second statement is the decision to buy major farm equipment. Which best describes your situation? I made the decision alone, I made the decision after I discussed it with my husband, we made the decision together, my husband made the decision after discussing it with me, or my husband made the decision alone.

I MADE ALONE ..... 1  
 I MADE WITH DISCUSSION/HUSBAND .... 2  
 WE MADE TOGETHER ..... 3  
 HUSBAND MADE AFTER DISCUSSION/ME... 4  
 HUSBAND MADE ALONE ..... 5  
 DON'T KNOW; REFUSE; NA ..... 9

(INTERVIEWER: FROM THIS POINT ON REPEAT CATEGORIES AS YOU DEEM NECESSARY)

Q-68: The third statement is the decision of when to sell crops or livestock? Which best describes your situation? I made the decision alone, I made the decision after I discussed it with my husband, we made the decision together, my husband made the decision after discussing it with me, or my husband made the decision alone.

I MADE ALONE ..... 1  
 I MADE WITH DISCUSSION/HUSBAND .... 2  
 WE MADE TOGETHER ..... 3  
 HUSBAND MADE AFTER DISCUSSION/ME... 4  
 HUSBAND MADE ALONE ..... 5  
 DON'T KNOW; REFUSE; NA ..... 9

Q-69: The fourth statement is the decision about you taking a job off the farm. Which best describes your situation? I made the decision alone, I made the decision after I discussed it with my husband, we made the decision together, my husband made the decision after discussing it with me, or my husband made the decision alone.

I MADE ALONE ..... 1  
 I MADE WITH DISCUSSION/HUSBAND .... 2  
 WE MADE TOGETHER ..... 3  
 HUSBAND MADE AFTER DISCUSSION/ME.. 4  
 HUSBAND MADE ALONE ..... 5  
 DON'T KNOW; REFUSE; NA ..... 9

We're also interested in knowing the sources of information farmers use when making decisions.

Q-70: Do you use the Oregon State University Extension Service as a source of information for making decisions in your farm or household operation?

YES ..... 1  
NO ..... 2

Oregon Farmers raise a wide assortment of crops and livestock. In this next section I'll be interested in finding out what your farm operation is like.

Q-71: How many acres do you own?

\_\_\_\_\_  
(ACRES)

Q-72: How many additional acres do you rent from someone else?

\_\_\_\_\_  
(ACRES)

[INTERVIEWER: ADD UP ACRES FROM Q-71 AND Q-72 AND USE IN BLANK BELOW]

Q-73: Let's see, the total number of acres you farm is

\_\_\_\_\_  
(ACRES)

Q-74: Is that correct?

YES ..... 1  
NO ..... 2

↓  
Q-74a: Could you please explain your correct acreage?

\_\_\_\_\_  
\_\_\_\_\_  
(ACRES AND EXPLANATION)

Q-75: Do you raise livestock on your farm?

YES ..... 1  
NO ..... 2

↓  
(GO TO QUESTION 84)

I'm going to read you a list of livestock typically raised in Oregon. As we go through the list, would you tell me if you had any of these animals on your farm during the past 12 months. If you don't raise that animal, just let me know and we'll go on to the next animal.

Q-76: The first type of livestock on the list is cattle and calves. Did you have any cattle and calves on your farm during the last twelve months?

YES ..... 1  
NO ..... 2

Q-77: Did you have any dairy cattle on your farm in the last 12 months?

YES ..... 1  
NO ..... 2

Q-78: Did you have any hogs and pigs?

YES ..... 1  
NO ..... 2

Q-79: Horses and ponies?

YES ..... 1  
NO ..... 2

Q-80: Sheep and lambs?

YES ..... 1  
NO ..... 2

Q-81: Goats?

YES ..... 1  
NO ..... 2

Q-82: Poultry?

YES ..... 1  
NO ..... 2

Q-83: Are there any other livestock that are an important part of your farm operation?

YES ..... 1  
NO ..... 2

Q-83a: What types do you have?

\_\_\_\_\_  
(NAME OF ANIMAL)

\_\_\_\_\_  
(NAME OF ANIMAL)

Q-84: Do you raise crops on your farm?

YES ..... 1  
NO ..... 2

↓  
(GO TO QUESTION 103)

I'm going to read you a list of crops typically raised in Oregon. As we go through the list, would you tell me if you raised these crops during the past twelve months. If you didn't raise that crop, let me know and we'll go on to the next one.

Q-85: The first crop on the list is corn. Did you raise corn on your farm in the past twelve months?

YES ..... 1  
NO ..... 2

Q-86: Did you raise wheat on your farm in the past twelve months?

YES ..... 1  
NO ..... 2

Q-87: Did you raise barley?	YES .....	1
	NO .....	2
Q-88: Oats?	YES .....	1
	NO .....	2
Q-89: Potatoes?	YES .....	1
	NO .....	2
Q-90: Alfalfa hay?	YES .....	1
	NO .....	2
Q-91: Hay other than alfalfa?	YES .....	1
	NO .....	2
Q-92: Field or grass seed?	YES .....	1
	NO .....	2
Q-93: Vegetables?	YES .....	1
	NO .....	2
Q-94: Berries?	YES .....	1
	NO .....	2
Q-95: Fruits other than berries?	YES .....	1
	NO .....	2
Q-96: Nuts?	YES .....	1
	NO .....	2
Q-97: Sod?	YES .....	1
	NO .....	2
Q-98: Christmas trees?	YES .....	1
	NO .....	2
Q-99: Nursery crops?	YES .....	1
	NO .....	2
Q-100: Greenhouse crops?	YES .....	1
	NO .....	2
Q-101: Mushrooms?	YES .....	1
	NO .....	2

Q-102: Was there any other crop that was an important part of your farm operation in the past twelve months?

YES ..... 1  
NO ..... 2

Q-102a: What crop was that?

\_\_\_\_\_  
(NAME OF CROP)

\_\_\_\_\_  
(NAME OF CROP)

We would like to get a measure of farm activity by asking you some questions about the finances of your operation. One measure is net farm income. Farm income is the money you got from selling crops and livestock. If you subtract the expenses of raising crops and livestock, you have net farm income.

Q-103: What do you think your net farm income was last year before taxes?

\_\_\_\_\_  
(AMOUNT)

We are interested in other important sources of income for farm families - such as rent, interest, and dividends. Please answer "yes" if the item I mention was an important source of income this past year, and "no" if it wasn't.

Q-104: Was rent from property an important source of income this past year?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-105: Was interest from savings an important source of income?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-106: Was dividends from stocks or bonds?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-107: Was payment from insurance or annuities?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-108: Was retirement income such as Social Security or pensions?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-109: Was government payments to the family such as unemployment or aide to families with dependent children?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-110: Was government payments to the farm such as PIK or price supports?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-111: Wages from children?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-112: Child support or alimony?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-113: Gifts, inheritance?

YES ..... 1  
NO ..... 2  
DON'T KNOW; REFUSE ... 9

Q-114: What do you think your total family income was last year before taxes?

(AMOUNT)

Q-115: Concerning your financial situation on the farm, how are you doing compared to five years ago? Would you say you are doing much better, somewhat better, about the same, somewhat worse, or much worse?

MUCH BETTER ..... 1  
SOMEWHAT BETTER ..... 2  
ABOUT THE SAME ..... 3  
SOMEWHAT WORSE ..... 4  
MUCH WORSE ..... 5  
WAS NOT FARMING 5 YEARS AGO ..... 6  
DON'T KNOW; REFUSE ..... 9

Q-116: How do you feel your farm will be doing five years from now? Would you say that it will be doing much better, somewhat better, about the same, somewhat worse, or much worse?

MUCH BETTER .....	1
SOMEWHAT BETTER .....	2
ABOUT THE SAME .....	3
SOMEWHAT WORSE .....	4
MUCH WORSE .....	5
DON'T KNOW; REFUSE .....	9

Q-117: In the next five years do you feel a person such as yourself could make as much money from full-time farming as from working off-farm full-time? Would you say more money in farming, more money in off-farm work, or about the same in either?

MORE MONEY IN FARMING .....	1
MORE MONEY IN OFF-FARM WORK .....	2
ABOUT THE SAME IN EITHER .....	3
DON'T KNOW; REFUSE .....	9

From time to time most farmers estimate the current market value of their land, buildings, machinery, crops, livestock, and supplies. This is the total value of their farm.

Q-118: What is the total value of your farm?

\_\_\_\_\_  
(DOLLARS)

Farmers can also estimate the total of all loans they have in relation to their farms. This is their total farm debt.

Q-119: What is your total farm debt?

\_\_\_\_\_  
(DOLLARS)

In this last section we need to ask you some questions about the people who live in your household. First we would like to know ...

Q-120: How old are you?

\_\_\_\_\_  
(YEARS)

Q-121: How old is your husband?

\_\_\_\_\_  
(YEARS)

Q-122: Do you have any children living in your household?

YES .....	1
NO .....	2

↓  
(GO TO QUESTION 125)



Q-123: How many children live with you?

\_\_\_\_\_  
(NUMBER)

Q-124: What are their ages?

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

Q-125: Are there any adults living in your household besides you and your husband?

YES ..... 1  
NO ..... 2

Q-125a: How many adults live in your household?

\_\_\_\_\_  
(NUMBER)

Q-125b: What are their ages?

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

\_\_\_\_\_  
(AGE)

We would also like to know about your schooling.

Q-126: Did you graduate from high school?

YES ..... 1  
NO ..... 2

Q-126a: How many years did you go to school?

\_\_\_\_\_  
(YEARS)

Q-127: Did you attend a trade school?

YES ..... 1  
NO ..... 2

Q-127a: How many years did you attend trade school?

\_\_\_\_\_  
(YEARS)

Q-128: Did you attend college?

YES ..... 1  
NO ..... 2

Q-128a: How many years did you attend college?

\_\_\_\_\_  
(YEARS)

Q-129: Did your husband graduate from high school?

YES ..... 1  
NO ..... 2

Q-129a: How many years did he go to school?

\_\_\_\_\_  
(YEARS)

Q-130: Did your husband attend a trade school?

YES ..... 1  
NO ..... 2

Q-130a: How many years did he attend trade school?

\_\_\_\_\_  
(YEARS)

Q-131: Did your husband attend college?

YES ..... 1  
NO ..... 2

Q-131a: How many years did he attend college?

\_\_\_\_\_  
(YEARS)

Q-132: Do you have a physical, mental, or other health condition which limits the work you can do?

YES ..... 1  
NO ..... 2

Q-132a: How long has it lasted?

\_\_\_\_\_  
(MONTHS)

Q-133: Does your husband have a physical, mental, or other health condition which limits the work he can do?

YES ..... 1  
NO ..... 2

Q-133a: How long has it lasted?

(MONTHS)

Q-134: Is there anything else you would like to tell us about your farm or your farm family?

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That was the last question on this part of our interview. The last part of our survey is a time record form which is mailed to selected farmers in Oregon. There are broad categories of time use on the chart and you simply draw lines on the chart to indicate different types of activity. We will collect this information by telephone a day or two after you complete the records.

Q-A. May we mail these forms to you?

YES ..... 1  
NO ..... 2

What is your address?

\_\_\_\_\_  
(STREET, RURAL ROUTE)

\_\_\_\_\_  
(CITY, STATE, ZIP)

Would you mind telling me your reason?

\_\_\_\_\_  
(FILL IN REASON VERBATIM)

We will put the forms in the mail tomorrow. The instructions will tell you which two days to keep the records and how to use the form. We will call you shortly after the last record keeping day and collect this information.

Q-B. Would you like to receive a summary of the results of our study when it is published?

YES ..... 1  
NO ..... 2

(IF ADDRESS WAS NOT COLLECTED ABOVE)  
What is your address?

\_\_\_\_\_  
(STREET, RURAL ROUTE)

\_\_\_\_\_  
(CITY, STATE, ZIP)

Q-C. I'd like to thank you again for completing the telephone study. Good-bye.