

12-1985

The Role of Fringe Benefits in Operator Off-Farm Labor Supply

Helen H. Jensen

Iowa State University, hhjensen@iastate.edu

Priscilla Salant

United States Department of Agriculture

Follow this and additional works at: http://lib.dr.iastate.edu/econ_las_pubs

 Part of the [Agricultural Economics Commons](#), [Labor Economics Commons](#), and the [Other Economics Commons](#)

The complete bibliographic information for this item can be found at http://lib.dr.iastate.edu/econ_las_pubs/210. For information on how to cite this item, please visit <http://lib.dr.iastate.edu/howtocite.html>.

This Article is brought to you for free and open access by the Economics at Iowa State University Digital Repository. It has been accepted for inclusion in Economics Publications by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.



OXFORD JOURNALS
OXFORD UNIVERSITY PRESS

Agricultural & Applied Economics Association

The Role of Fringe Benefits in Operator Off-Farm Labor Supply

Author(s): Helen H. Jensen and Priscilla Salant

Source: *American Journal of Agricultural Economics*, Vol. 67, No. 5, Proceedings Issue (Dec., 1985), pp. 1095-1099

Published by: Oxford University Press on behalf of the Agricultural & Applied Economics Association

Stable URL: <http://www.jstor.org/stable/1241379>

Accessed: 13-10-2016 20:00 UTC

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://about.jstor.org/terms>



Agricultural & Applied Economics Association, Oxford University Press are collaborating with JSTOR to digitize, preserve and extend access to *American Journal of Agricultural Economics*

The Role of Fringe Benefits in Operator Off-Farm Labor Supply

Helen H. Jensen and Priscilla Salant

The last thirty years have seen a major shift in the share of total compensation paid to workers in the form of nonwage fringe benefits, that is, payments in a form other than currently spendable cash (Chen). Fringe benefits have become increasingly important because they are a source of income that receives preferential tax treatment, and can often be offered at group savings, as in the case of purchase of life and health insurance.

The tax and group rate advantages of fringe benefits as compensation for work become available to most farm households only through off-farm employment. Thus, it is important to understand the relationship between nonwage compensation and off-farm labor supply. Concentration on the role of money wages in inducing off-farm labor supply neglects the potent effect of additional income in the form of fringe benefits.

Off-farm work by members of farm households has become a well-established strategy for using farm-based labor resources. In 1983, 45% of employed farm residents in the United States worked solely or principally in nonagricultural industries, up from 34% in 1960 (U.S. Department of Commerce 1961, 1984). Fifty-five percent of all farm households reported off-farm employment by the operator and/or spouse in 1979 (U.S. Department of Commerce 1982). Thus, a significant number of farm persons receive compensation for time spent in off-farm activities.

This paper focuses on the contribution of fringe benefits to off-farm labor supply. We examine the types of benefits received by persons working off-farm, and develop a model of operator off-farm labor supply which explicitly takes account of the fringe benefit compo-

nent of off-farm compensation. Data from the 1981 U.S. Department of Agriculture Family Farm Survey in Mississippi and Tennessee are used to describe the composition of benefits received and estimate parameters in a labor supply model.¹

The outline is as follows: first, a discussion of the role of fringe benefits as a form of compensation; second, a description of the off-farm labor supply model; third, empirical evidence on the role of fringe benefits in operator off-farm labor supply; and finally, conclusions with respect to the role of fringe benefits.

Fringe Benefits as Compensation

The standard view of fringe benefits is that they, like nonpecuniary characteristics of jobs, provide a substitute for money wages (Ehrenberg and Smith). That is, workers are willing to accept a lower money wage in return for more fringe benefit compensation. Two factors account for a relative price differential which favors receiving some income in the form of employer-paid benefits. First, employer-provided fringe benefits are not taxed as income. Second, lower per unit costs may be achieved by employer group purchase of the commodity or service provided as fringes. Other institutional factors have an effect on whether fringe benefits are offered, for example, industry type, union activity, and length of time of worker employment.

There is some empirical support for the hypothesis that wage payments and fringe benefits are substitutes, particularly in the case of pension benefits (Woodbury). Just like wages, nonwage compensation enhances income and, hence, well-being. Although their actual value to the individual may be less than the cost of providing the benefit, in most cases the employee can opt out of receiving the benefit should the value be negative. Thus, in-

Helen H. Jensen is an assistant professor, Department of Economics, Iowa State University; Priscilla Salant is an economist, Economic Research Service, U.S. Department of Agriculture and an adjunct instructor, Department of Agricultural Economics, University of Wisconsin.

The authors acknowledge the helpful comments received from Wallace E. Huffman, Peter Orazem, and William E. Sauppe at earlier stages of this paper.

¹ The estimation is reported in detail in a forthcoming USDA Economic Research Service staff paper.

creases in fringe benefits should lead to increased value of time spent in off-farm work.

The lack of consistently unambiguous findings regarding the effect of fringe benefits on labor supply has been attributed to the importance of labor market institutions affecting the type of benefit compensation and the fact that employees themselves may not be fully informed about the value of fringe benefits.

Off-Farm Labor Supply

The distinguishing feature of the off-farm labor supply decision is that in allocation of the scarce resource time, the individual's time spent in nonfarm market work competes directly with time spent working on the farm (see e.g., Huffman, Sumner). Thus, the important criterion for off-farm labor supply is that the marginal return from time spent in off-farm work is greater than (or equal to) the marginal return from time spent in farm activities (or other household activities, including leisure). Factors which increase marginal productivity in off-farm work relative to farm work or household work are associated with increased off-farm labor supply.

Time allocated to farm work yields an implicit return equal to the value of the marginal product of the labor input. In competitive labor markets, time allocated to market work, that is, to off-farm employment, is paid the value of its marginal product—and compensated in the form of direct market wages or indirectly as “fringe benefit” compensation. Other time is allocated to household activities and is valued at its opportunity cost, which is equal to the (highest) value of alternative use. The farm individual allocates time to market work when the marginal return (including wages and benefits) from time in market work is greater than the marginal return from time spent in farm work. Commuting costs, as well as other negative job characteristics, detract from this return, while positive, nonpecuniary job characteristics enhance the return. Fringe benefits viewed in this context increase the return from off-farm work above the level of the money wage.

Empirical Evidence

The data used in this analysis are from the 1981 USDA Family Farm Survey. The survey was based on a stratified cluster sample design

which yielded usable questionnaires from 1,087 farm families in twenty-three counties in northern Mississippi and six counties in southwestern Tennessee.²

Agriculturally, the area is typical of much of the South insofar as a significant proportion of the land is in farms, and agriculture is dominated by small operations. The survey site contains no large metropolitan centers, although there are a number of small and medium-size towns that provide some employment opportunities for farm residents. Low population density in the survey area has not encouraged either a strong service sector or generally diversified economic activities.

Sixty-two percent of the households discussed in this report reported off-farm work by the operator and/or spouse in 1980; 48% of the operators, and 37% of the spouses worked off-farm. Most persons employed off-farm reported full-time wage or salary jobs. As is the case of employment in many rural labor markets, these jobs were generally low skilled. They paid, on average, \$5.60 per hour; 14% of workers earned less than \$3.10 per hour.

Four fringe benefits were commonly reported: paid vacation and/or sick leave, health insurance, private pension plans, and life insurance. Thirty percent of all workers received all four of the benefits; 53% received at least three; 23% received none. As reported in table 1, full-time workers, those in durable goods manufacturing, and those with higher wage rates were most likely to receive benefits. Intermittent employees (those working less than 1,152 hours per year) were least likely to receive the benefits.

An operator labor supply model was estimated in which hours of off-farm work were assumed to be a function of both the fringe benefit and wage component of compensation, among other variables.

The empirical specification of the wage, benefits, and hours of market work equations are of the form:

$$(1) \quad \ln W_j = \sum_{i=1}^k \beta_i X_{ij} + U_{1j}$$

$$(2) \quad B_j = \sum_{i=1}^m \gamma_i S_{ij} + U_{2j}$$

² For purposes of this report, a farm is defined as a business that produced agricultural sales of at least \$1,000 in 1980 or would have done so under typical growing conditions. The farm operator was designated as the person responsible for major administrative and managerial functions, as well as for day-to-day decisions on the farm. See Salant for more information on the sample design.

Table 1. Worker and Employment Characteristics, By Benefits Received

Item	Total Workers ^a	Workers Reporting Benefit			
		Paid Leave	Health Insurance	Life Insurance	Pension Plan
----- (%) -----					
Operator status					
Operator	52	68	60	46	48
Spouse	48	69	59	40	43
	100				
Employment off-farm ^b					
Intermittent	20	25	20	16	21
Part-time	20	65	55	40	56
Full-time	60	85	73	52	50
	100				
Industry					
Manufacturing					
Durable	18	93	85	74	60
Nondurable	13	80	72	43	41
Service	34	57	46	31	48
Trade	11	47	37	27	11
Other	24	65	60	42	49
	100				
Wage rate per hour					
Less than \$3.10	14	41	31	24	24
\$3.10-4.49	37	70	62	39	36
\$4.50-5.99	15	77	69	49	43
\$6.00-8.99	22	77	64	46	64
\$9.00 or more	12	67	68	63	68
	100				

Source: 1981 USDA Family Farm Survey.

^a Only operator and spouse are included as workers here.

^b Intermittent refers to less than 1,152 hours in 1980; part-time refers to at least 1,152 but less than 1,680 hours; full-time refers to 1,680 hours or more.

$$(3) \quad T_{mj} = \delta_1 \ln \widehat{W}_j + \delta_2 \widehat{B}_j + \sum_{i=3}^8 \delta_i Z_{ij} + \xi_j$$

where j is 1, . . . , n individuals; $\ln \widehat{W}_j$ is natural log of wage; B_j is fringe benefits; U_{1j}, U_{2j}, ξ_j are random errors; X_i is exogenous variables affecting wages; S_i , exogenous variables affecting benefits; Z_i , exogenous variables affecting hours of off-farm labor supply (T_m), including those that affect operator on-farm productivity. Estimated wages and estimated benefits enter the "hours" equation as instrumental variables. Equations (1) and (2) were estimated in a two-stage procedure in order to take account of potential sample selection bias.³ The sample of working farm operators

³ We are concerned that any estimations based only on observations of operators working off-farm will be biased because these operators may not provide random observations. Our sample may be nonrandom because operators without off-farm jobs have been censored. That is, the errors of the estimated compensation functions are not independent of the errors in the sample selection criteria. The regression functions on compensation are conditional

was used in the estimation of equations (1), (2), and (3). A significance level of .20 is used as a criterion in the following discussion.

Both wages and benefits were estimated as functions of operator human capital and labor market characteristics (table 2). In the wage equation, age and age-squared had the expected nonlinear effect (+, -); the effect of education on wages was positive; being white increased wages. There was no significant sample selection bias.

In the estimation of benefits, which were measured as the probability of receiving health insurance, operator age, education, and the industry characteristics of the operator's employment were included as explanatory variables. The equation was estimated as a probit function using the maximum likelihood technique. The most significant determinants of benefits received were the industry variables. Operators employed in manufacturing, especially durable manufacturing, were more likely

Table 2. Estimated Coefficients for Operators Off-Farm Compensation

Explanatory Variables	Wages		Benefits	
	Estimated Coefficient	Standard Error	Estimated Coefficient	Asymptotic Standard Error
<i>CONSTANT</i>	-.153	.424	.996	1.349
<i>AGE</i>	.066	.016	-.017	.053
<i>AGESQ</i>	-.00077	.00018	.0001	.0006
<i>EDUCATION</i>	.045	.008	.030	.027
<i>NONFARM TRAINING</i>	.077	.096		
<i>RACE</i> (White = 1)	.099	.077		
<i>HEALTH PROBLEM</i>	-.059	.126		
<i>INDUSTRY</i>				
<i>TRADE</i>			-.338	.243
<i>CONSTRUCTION</i>			-.192	.270
<i>MANUF-NONDUR</i>			.521	.302
<i>MANUF-DURABLE</i>			1.098	.242
<i>SAMPLE SELECTION</i>	.081	.080	-.966	.259
Dependent variable	<i>LNWAGE</i>		<i>HEALTH INSURANCE</i> (0, 1)	
Estimation technique	OLS		Probit/Maximum Likelihood	
Number of observations	301		301	
Adjusted R-Square	.17			
Log of likelihood function			-170	
-2 (log of likelihood ratio)			68 (df = 8)	

Source: 1981 USDA Family Farm Survey.

to receive benefits. Sample selection was significant in this estimation.

The estimation of hours of labor supplied (3) using ordinary least squares allows testing for the significance of wages and benefits as determinants of off-farm hours of work. The estimated values of wages and benefits (holding constant sample selection) enter the equation (table 3). Both had a positive effect on operator hours of off-farm work, indicating that both money wages and benefits induce off-farm labor supply. This is consistent with the economic valuation of fringes. As expected, unearned income has a negative effect on labor supply, as does operator education. That is, more education makes the operator more productive on the farm, holding compensation constant. The negative effect of having children over eighteen suggests the presence of intrafamily allocation decisions.

Discussion

Fringe benefits from off-farm employment are an important aspect of the off-farm work decision. The empirical analysis supports this. We

on the criteria for selecting an operator working off-farm. First participation was estimated for the entire sample using all exogenous variables determining relative marginal productivity of time. This estimation yields a term (referred to as sample selection in table 2) to be included in the subsequent estimation of compensation to test for sample selectivity bias (Heckman).

found that benefits (as well as wages) have a positive effect on operator off-farm labor supply. Thus, in treating off-farm work as a tool of management for farm-based labor resources, it is important to evaluate work off of the farm in

Table 3. Hours of Off-Farm Work: Estimated Coefficients from Ordinary Least Squares Regression

Explanatory Variables ^a	Estimated Coefficients	Standard Errors
<i>CONSTANT</i>	-249.52	592.34
<i>AGE</i>	_b	
<i>AGESQ</i>	-.03	.06
<i>EDUCATION</i>	-49.50	21.96
<i>HEALTH PROBLEM</i>	6.80	185.33
<i>RACE</i> (White = 1)	201.78	130.04
<i>EDUCATION SPOUSE</i>	-15.25	18.74
<i>MARRIED</i>	375.46	261.36
<i>CHILD UNDER 6</i>	14.79	121.01
<i>CHILD 6-17</i>	27.22	81.66
<i>CHILD 18+</i>	-155.51	86.67
<i>UNEARNEDY</i> (000)	-29.62	18.09
<i>ESTWAGE</i>	1072.70	381.98
<i>ESTBENEFIT</i>	360.65	228.12
Dependent variable	<i>HOURS</i>	
Number of observations	301	
Adjusted R-squared	.26	

Source: 1981 USDA Family Farm Survey.

^a The set of farm type and specialization variables are not reported here. They are available from the authors.

^b *AGE* did not meet the tolerance test ($= .01$) and was not entered into the estimated model.

light of its full return. Off-farm work augments well-being through the enhancement of both money income and the value of fringes, as evidenced by their role in compensating the increased labor supply.

Descriptive data, as well as the estimation of the probability of receiving health insurance, show that institutional factors in the labor market play an important role in benefit availability. From a rural development perspective, the finding that certain industries, like manufacturing, offer relatively more fringe benefits, and that these benefits themselves induce off-farm labor are important considerations in evaluating the effects of industry location. In addition, the clear distinction in availability of fringes to those working more than intermittently suggests the greater value to farm households of increased commitment to off-farm work.

Several problems arise in evaluating the role of benefits in operator off-farm labor supply. The appropriate measure of benefits received should be a dollar value. Such a value is difficult to determine both theoretically and empirically, and was not available in the data. As such, it was impossible to estimate a willingness to substitute fringe benefits for wages. However, this may be a less important phenomenon in a labor market characterized by limited local opportunities. We have little information on the specific labor market which each individual faced.

In addition, the household decision-making process may involve joint decisions. By looking only at the operator decision, possible interdependence with the spouse's decision with respect to off-farm labor supply and fringes is lost.

While we did find that fringe benefits induce more operator off-farm labor supply, it is important to recognize that the operator may not be well informed about the value of benefits. Thus, any labor supply response to benefits is

related to the operator's specific knowledge of the benefits' contribution to off-farm income.

Finally, we recognize that the availability of many fringe benefits to workers is in the form of goods and services which protect human capital (such as health insurance or sick leave). We suspect, though cannot show with this data set, that the contribution of fringe benefits to well-being may also come in the protection or enhancement of human capital through in-kind provision of the human capital-preserving goods and services, independent of the direct money effect. If this is the case, the fringe benefits enhance well-being both through their observed effect on increased income, and through their unobserved effect on better health or other human capital.

References

- Chen, Yung-Ping. "The Growth of Fringes." *Monthly Labor Rev.* 104(1981):3-11.
- Ehrenberg, Ronald G., and Robert S. Smith. *Modern Labor Economics: Theory and Public Policy*. Glenview IL: Scott, Foresman, and Co., 1982.
- Heckman, James J. "Sample Selection Bias as a Specification Error." *Econometrica* 47(1979):153-61.
- Huffman, Wallace E. "Farm and Off-Farm Work Decision: The Role of Human Capital." *Rev. Econ. and Statist.* 62(1980):14-23.
- Salant, Priscilla. *Farm Households and the Off-Farm Sector: Results From Mississippi and Tennessee*. Mississippi Agr. and Forestry Exp. Sta. and U.S. Department of Agriculture, Econ. Res. Serv. Agr. Econ. Res. Rep. No. 143, Jan. 1984.
- Sumner, Daniel A. "The Off-Farm Labor Supply of Farmers." *Amer. J. Agr. Econ.* 64(1982):499-509.
- U.S. Department of Commerce, Bureau of the Census, jointly with the U.S. Department of Agriculture. *Current Population Reports*. Series P-27, No. 29 (1961) and No. 57 (1984), Washington DC.
- . *1978 Census of Agriculture Special Report, Part 6, 1979 Farm Finance Survey*. Rep. AC 78-SR-6, Washington DC, 1982.
- Woodbury, Stephen A. "Substitution between Wage and Nonwage Benefits." *Amer. Econ. Rev.* 73(1983): 166-82.