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#8469

1990

THE IMPACT OF NONFARM LABOR MARKETS ON OFF-FARM INCOME

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August 1990

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Presented at the 1990 American  
Agricultural Economics Association  
annual meeting, August 5, 1990,  
Vancouver, British Columbia

off-farm employment

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## THE IMPACT OF NONFARM LABOR MARKETS ON OFF-FARM INCOME

Facts: Most farm households in the U.S. are highly dependent on off-farm income.

Most off-farm income (65 %) is obtained from working at nonfarm jobs.

Issues: How does the nonfarm labor market affect the incomes of farmers?

How responsive are farm households in allocating their labor between farm and nonfarm uses?

Approach: Estimate the responsiveness of off-farm income to changes in nonfarm labor market variables; including wages and unemployment rates

- Variables:
- Y = Off-farm income
  - w = nonfarm market wage rate
  - N = supply of farm people seeking off-farm jobs
  - p = probability of finding an off-farm job
  - u = unemployment rate
  - n = number of farm people actually working off-farm
  - I = non-labor income, e.g. transfer or rental payments
  - h = average hours worked at an off-farm job

- Equations:
- $Y = wnh + I$
  - $n = p(u)N(w)$
  - $h = h(w)$
  - w determined by factors exogenous to farm sector

substituting, we obtain:

$$Y = w p(u) N(w) h(w) + I$$

differentiate with respect to w, the wage:

$$\frac{dY}{dw} = hpN + wpN \frac{dh}{dw} + whp \frac{dN}{dw}$$

Write the elasticity as:

$$\epsilon_{Yw} = [whn/Y][1 + \epsilon_{hw} + \epsilon_{Nw}]$$

The elasticity of off-farm income with respect to wages is 1 plus the elasticity of hours with respect to wages plus the elasticity of number of labor market participants, weighted by the share of off-farm income obtained from off-farm work.

The elasticity with respect to unemployment is:

$$\epsilon_{Yu} = (whn/Y)\epsilon_{Nu}$$

the elasticity of off-farm income with respect to unemployment is the elasticity of the number working off-farm with respect to unemployment weighted by the share of off-farm income obtained from off-farm work.

Table 1. Sources of off-farm income\*

Source	Amount (millions)	Percent * of Total
Cash Wages, Salaries, Commissions, Tips		
Nonfarm Jobs or Professions	\$21,212	65
Farm Work	1,089	3
Nonfarm Business or Professional Practice	2,874	9
Interest	2,608	8
Dividends	917	3
Retirement, Disability Payments	2,870	9
Estates, Trusts, Nonfarm Rent, Payments for Mineral Rights	915	3
Annuities, Alimony	192	0.6
Public Assistance Payments	76	0.2
Total	\$32,754	100

\* Percentages do not add to 100 due to rounding.  
Source: 1979 Farm Finance Survey, U.S. Department of Commerce, Bureau of the Census

Table 2. Data sources

Variable	
Total Off-Farm Income	USDA, ERS.
Average Hourly Earnings of Production Workers on Manufacturing	US Dept. Labor, Bureau of Labor Statistics (b).
Total Unemployment Rate: Annual Average	US Dept. Labor (1970); US Dept. Labor, BLS (a).
Total Net Farm Income	USDA, ERS.
Number of Farms	USDA (1973,1977,1989)

All variables are state-level, annual for years 1960-1987.

Table 3. Off-farm income regressions, by region

Region	Variable			R <sup>2</sup>
	WAGE	UNEMP	FINC	
New England	2626* (602)	-380* (84)	.022 (.016)	.26
Mid-Atlantic	5089* (802)	-502* (94)	.064* (.026)	.42
Lake States	3919* (424)	-324* (106)	.065* (.025)	.53
Corn Belt	3306* (652)	-497* (103)	-.005 (.021)	.26
Appalachian	3164* (437)	-428* (59)	.012 (.031)	.46
Southeast	6513* (528)	-299* (79)	.087* (.023)	.68
Delta	3205* (526)	-409* (102)	.029 (.025)	.39
South Plains	3452* (931)	-565* (230)	.068 (.063)	.26
Northern Plains	1936* (499)	-126 (165)	.069* (.013)	.27
Mountain <sup>1/</sup>	2502* (554)	-133 (120)	.092* (.015)	.33
Pacific	2368* (673)	-395* (117)	.130* (.029)	.39

Regression coefficients estimated by Parks method from pooled state-level data over years 1960-87 are shown with standard errors in parentheses, intercepts not shown.

\* denotes coefficient significantly different from zero at .05 level.

<sup>1/</sup> Utah, Nevada, and New Mexico were excluded from the Mountain region sample (see note 5).

Table 4. Estimated Nonfarm Wage and Unemployment Elasticities, by Region

Region	<u>wage</u>		<u>unemployment</u>	
	$\epsilon_{Yw}$	$\epsilon_{Hw} + \epsilon_{Nw}$	$\epsilon_{Yu}$	$\epsilon_{Tu}$
New England	1.07	.70	-.13	-.20
Mid-Atlantic	2.31	2.25	-.17	-.24
Lake States	2.76	2.82	-.15	-.21
Corn Belt	2.00	1.78	-.18	-.26
Appalachian	1.69	1.42	-.20	-.26
Southeast	2.56	2.72	-.11	-.16
Delta	1.53	1.19	-.20	-.29
South Plains	1.47	1.27	-.16	-.24
Northern Plains	1.42	1.22	ns	ns
Mountain	1.29	1.08	ns	ns
Pacific	1.08	.80	-.14	-.23

Definitions of elasticities (dependent variable / independent variable):

$\epsilon_{Yw}$ : total off-farm income / nonfarm wage.

$\epsilon_{Hw}$ : average hours worked off-farm / nonfarm wage.

$\epsilon_{Nw}$ : number of farmers working off-farm / nonfarm-wage.

$\epsilon_{Yu}$ : total off-farm income / unemployment rate.

$\epsilon_{Tu}$ : number of farmers working off-farm / unemployment rate.

## References

Bowen, W.G. and T.A. Finegan. The Economics of Labor Force Participation. Princeton: Princeton University Press, 1966.

Findeis, J.L., M.C. Hallberg, and D. Lass, "Off-Farm Employment: Research and Issues," AE&RS Staff Paper 146, Pennsylvania State University, 1987.

Gould, B.J. and W.E. Saupe, "Off-Farm Labor Market Entry and Exit," American Journal of Agricultural Economics 71(1989):960-969.

Huffman, W.E. "Farm and Off-Farm Work Decisions: The Role of Human Capital," Rev. of Econ. and Stat. 62(1980):14-23.

\_\_\_\_\_, "Off-Farm Work, Local Economic Conditions, and Small Farmers," presented at AAEA annual meeting, Baton Rouge, 1989.

Killingsworth, M.R. Labor Supply. Cambridge: Cambridge University Press, 1983.

Reddy, V.K. and J.L. Findeis, "Determinants of Off-Farm Labor Force Participation: Implications For Low Income Families," N. Cent. J. of Agr. Econ. 10(1988):91-102.

Sumner, D.A. "The Off-Farm Labor Supply of Farmers," Am. J. of Agr. Econ. 64(1982):499-509.

U.S. Dept. of Agriculture, Economic Research Service. Economic Indicators of the Farm Sector, State Financial Summary, various issues.

\_\_\_\_\_, Statistical Reporting Service. Farms: Revised Estimates 1959-70. SB 507(1973).

\_\_\_\_\_, Statistical Reporting Service. Farms and Land in Farms: Final Estimates by States, 1969-75. SB 594 (1977).

\_\_\_\_\_, National Agricultural Statistics Service. Farms and Land in Farms: Final Estimates by States, 1979-87. SpSy 5(1989).

U.S. Dept. of Commerce, Bureau of the Census. 1979 Farm Finance Survey. vol. 5, Special Reports, 1978 Census of Agriculture.

U.S. Dept. of Labor. Manpower Report of the President, 1970.

U.S. Dept. of Labor, Bureau of Labor Statistics. Geographic Profile of Employment and Unemployment, various issues.

\_\_\_\_\_. Handbook of Labor Statistics. various issues.



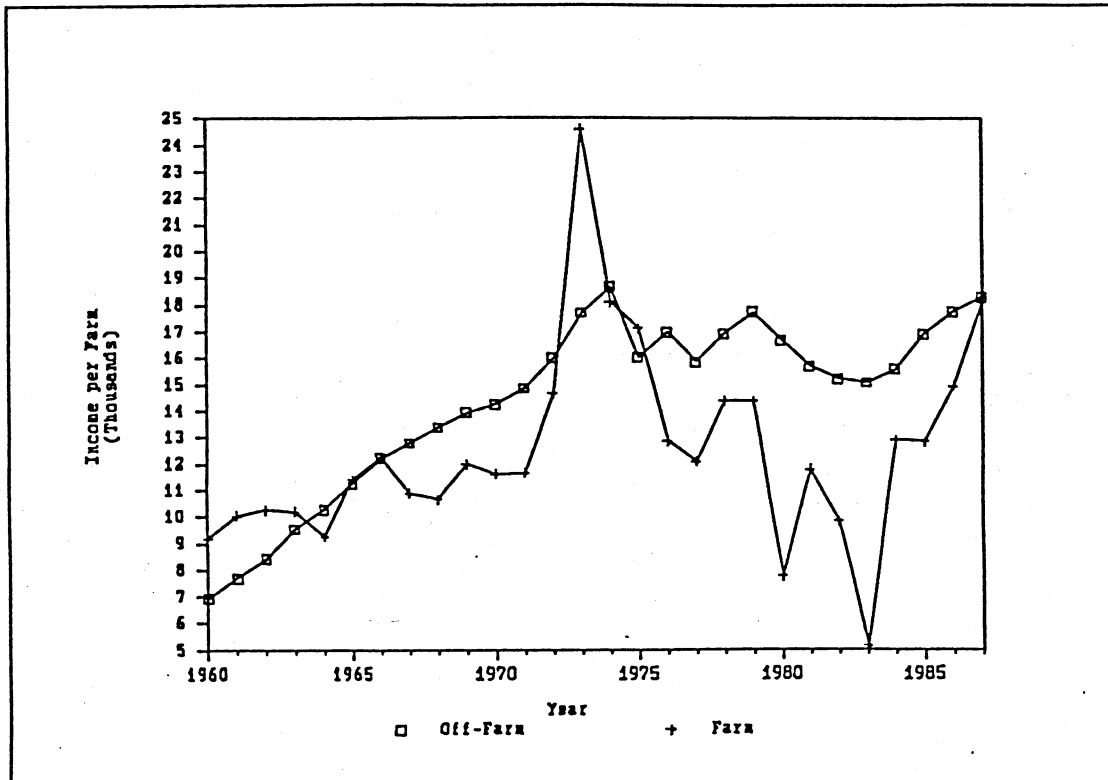


Figure 1. Off-farm and farm income, United States

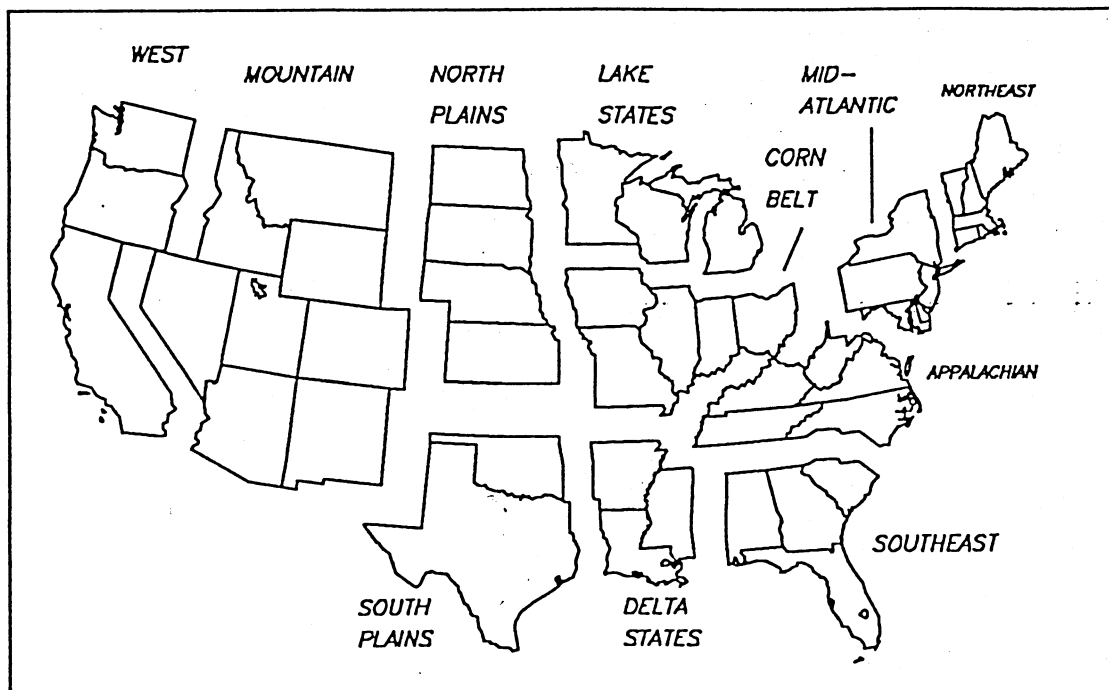


Figure 2. Eleven U.S. regions