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The Off-Farm Occupations of U.S. Farm Operators and Their Spouses

Jason P. Brown

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United States Department of Agriculture

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Jason P. Brown

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Abstract

Because of the broad definition of a farm—which includes numerous small operations that produce little or no agricultural commodities in any given year—most farm households earn all of their income from nonfarm sources. However, even those operating farms with substantial production often have significant nonfarm income. Most nonfarm income, in turn, comes from off-farm jobs. Industry and occupation information collected by the U.S. Department of Agriculture’s 2010 Agricultural Resource Management Survey (ARMS) provides one indication of how the skills demanded and cultivated on the farm influence off-farm employment incentives and opportunities. Consistent with the notion that farming requires substantial management skills, this study finds that when farm operators and their spouses work off farm, they are most likely to hold a management or professional occupation. This is especially true for households operating larger farms.

Keywords: occupation, industry, off-farm income, ARMS

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The Off-Farm Occupations of U.S. Farm Operators and Their Spouses

Jason P. Brown and Jeremy G. Weber

What Is the Issue?

Because of the broad definition of a farm—which includes numerous small operations that produce little or no agricultural commodities in any given year—most farm households earn all of their income from nonfarm sources. However, even those operating farms with substantial production often have significant nonfarm income. Most nonfarm income, in turn, comes from off-farm jobs. Since farm household income has increased more than the income of the typical U.S. household over the last 15 years, based largely on higher nonfarm incomes, a closer examination of what farm operators and their spouses do to earn their nonfarm income is warranted. Are there complementarities between what farm household members do on and off the farm that could explain past income trends? Looking forward, as the skills demanded and nurtured on the farm change with evolving technologies, particularly on larger farms, how will the opportunities and compensation for off-farm jobs change for farm operators and their spouses? Prior research has shown the importance of distinguishing between what people “make” (industry) versus what they “do” (occupation). This report describes the most common occupations and industries of off-farm wage and salary jobs held by the operators of family farms and their spouses.

What Did the Study Find?

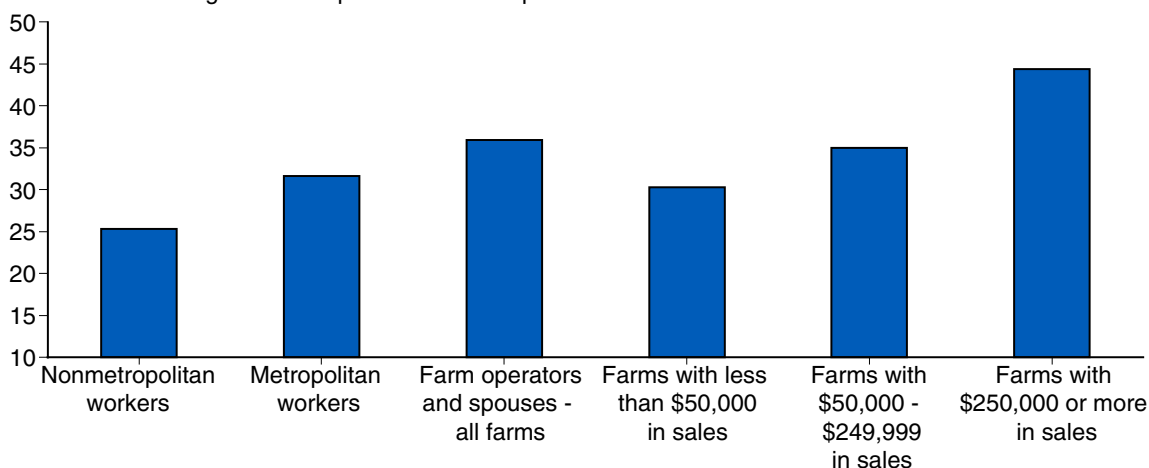
Most farm households (91 percent) have at least one family member working at an off-farm job. Of farm operators and their spouses with off-farm jobs, 35.9 percent held professional and management occupations in 2010. This is higher than for metropolitan area workers in general (31.6 percent) or for nonmetropolitan workers (25.3 percent). Operators of larger farms and their spouses reported the highest shares of management and professional occupations in their off-farm jobs, suggesting that they have a high capacity to apply their knowledge and skills from managing a sizeable farm operation to other areas of employment.

- Farm operators and their spouses are more likely than other workers to have management and professional off-farm occupations.
- Management and professional occupations paid higher wages on average than other occupations. For farm operators, management occupations paid \$7 an hour more (on average) than the next highest paying occupation (sales and office support), and nearly double that paid by service occupations or those in production, transportation, and materials moving. Although the wage differences are more modest for spouses, management occupations still paid them 21 percent more than the next highest paying occupation.
- Professional and management occupations were most commonly held by operators and spouses with a college education. For them, 56.2 percent of operators and 60.6 percent of spouses had a

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Share of workers in off-farm management and professional occupations, 2010

Percent with management and professional occupations



Note: The subsample of farms includes only family farm households with married couples where the operator or spouse works off farm. Occupation by farm size refers to the occupation of the farm operator.

Sources: USDA, Economic Research Service using the 2010 Occupational Employment Statistics of the Bureau of Labor Statistics for area-wide occupations and USDA's 2010 Agricultural Resource Management Survey, Version 1 for farm household member occupations.

professional and management occupation. The same was true for only 16.9 percent of operators and 20.5 percent of spouses who worked off farm but who only had a high school education. Operators with only a high school education were most likely to have an occupation in production, transportation, and materials moving (32.3 percent), while spouses were most likely to work in services (45.3 percent).

- Regarding the industry of off-farm employment, farm operators primarily worked in the construction (18.7 percent); agriculture, forestry, fishing, hunting, or mining (15.3 percent); or manufacturing (12.9 percent) industries, while their spouses most often worked in education (22.3 percent) or healthcare (19.7 percent). Operators of farms with less than \$50,000 in annual sales had higher shares of jobs in the manufacturing and construction industries, while operators of larger farms (with higher annual sales) had the highest shares in the agriculture, forestry, fishing, hunting, or mining industry.

According to the literature on the U.S. labor market, the gap between wages for skilled and unskilled labor in the United States has widened, particularly in the late 1990s and early 2000s. Combined with this growing disparity, evidence of higher skills among farm households, especially those with larger farms, provides one explanation for their relatively higher income growth in the last 15 years.

How Was the Study Conducted?

Farm-level information from the U.S. Department of Agriculture's (USDA) 2010 Agricultural Resource Management Survey (ARMS) was used to examine the occupation and industry of the off-farm jobs held by farm operators and their spouses who reported having off-farm labor income. The 2010 ARMS is the first year in which both the off-farm occupation and the industry type of the off-farm job has been asked of farm operators and spouses. Farm and household characteristics reported on the ARMS allow for comparisons across farm types, education levels, and age. This study also makes comparisons to national occupational data of nonfarm industries provided by the U.S. Bureau of Labor Statistics.

The Off-Farm Occupations of U.S. Farm Operators and Their Spouses

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Introduction

The typical family farm household in the United States derives all of its income from off-farm sources. This, in part, reflects a broadly defined farm population, where small farms—often with potential annual sales of as little as \$1,000—account for 90.9 percent of all farms (Hoppe and MacDonald, 2013). However, even households operating larger farms often have substantial nonfarm income: in 2011, median off-farm income was \$29,250 for households with family farms with \$250,000 or more in annual sales (USDA ERS, 2012a).¹ There have been many studies about the participation of family farm households in off-farm labor markets (Huffman, 1980; Huffman and Lange, 1989), and extensive literature documents the relationships between labor market participation and characteristics such as farm size, education, and access to health insurance (El-Osta et al., 2008; El-Osta, 2011; Mishra et al., 2012; Mishra and Chang, 2012).

To date, however, almost nothing has been said about the industry (what they make) or occupation (what they do) of farm household members employed off the farm. Such industry and occupation information can reveal how the skills demanded and cultivated on the farm influence off-farm employment incentives and opportunities. Occupation data can be particularly revealing since knowledge and skills are two important characteristics that distinguish one occupation from another (Feser, 2003; Koo, 2005).

The importance of human capital for agricultural technology adoption and farm management has long been recognized (Schultz, 1964; Rahm and Huffman, 1984), so we might expect farm operators and spouses to have occupations demanding substantial knowledge and skills. Evidence suggests that the gap between wages for skilled and unskilled labor in the U.S. labor market has increased, with the gap widening substantially in the late 1990s and early 2000s (Autor et al., 2008). If farm households tend to work in more highly skilled occupations, it could help explain why their incomes have grown relative to the incomes of U.S. households in general over the last 15 years. From 1991 to 1997, median farm household income (which is driven almost entirely by off-farm income) was consistently less than median U.S. household income (fig. 1). Since 1998, however, the opposite has been true (USDA ERS, 2012a). The reversal may reflect greater returns to farm household skills employed off the farm, in addition to other factors such as changes in the composition of the farm population.

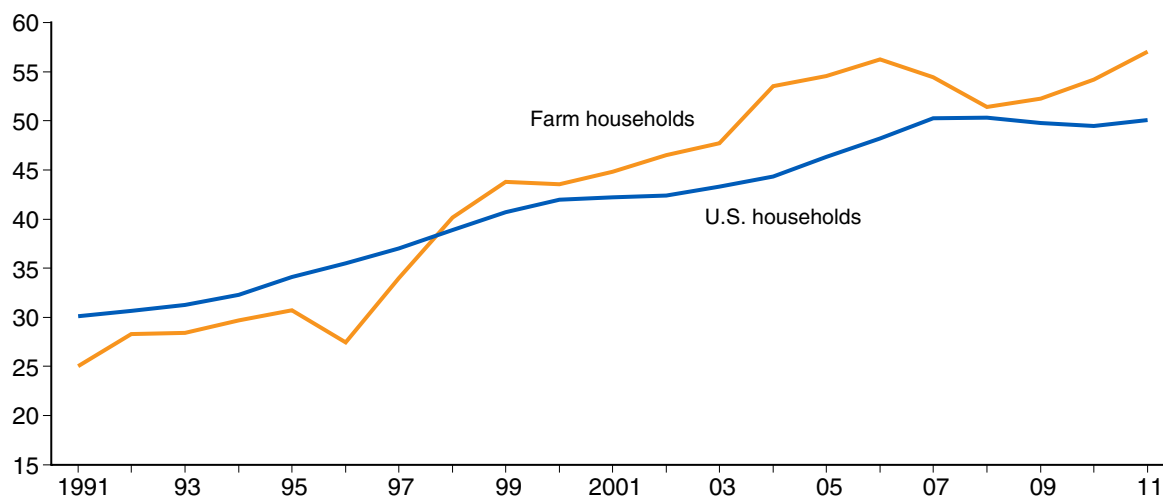
¹The current definition of a family farm is one in which the majority of the business is owned by the operator and individuals related to the operator by blood, marriage, or adoption (including relatives who do not live in the operator household). Although the definition of a family farm has changed somewhat over time, the share of U.S. farms classified as family farms (between 97.1 and 98.3 percent of all farms) has changed little since 1996 (USDA ERS, 2012c). Nonfamily farms are excluded from the current analysis because it is difficult to ascertain influential factors on off-farm labor participation decisions.

While data on the occupations and industries of off-farm jobs are not routinely collected from farm households,² the U.S. Department of Agriculture’s (USDA) 2010 Agricultural Resource Management Survey (ARMS) asked respondents for the occupation of the operator’s and/or spouse’s off-farm job, which complemented an existing question about their off-farm employer’s type of business. This report provides a detailed look at this information for farm households with married couples, identifying the occupational profile of the off-farm employment of operators and spouses given their educational attainment, age, and farm size, as well as the industrial sector of their off-farm employment.

Figure 1

Median household income for farm and U.S. households, 1991-2011

Income (1,000 \$)



Sources: The USDA’s Farm Cost and Returns Survey (1991-1995) and Agricultural Resource Management Survey (1996-2011). U.S. median household income is from the Current Population Survey, U.S. Census Bureau.

²A question on the 2003 Agricultural Resource Management Survey (ARMS) asked for information on the off-farm occupation of farm operators reporting nonfarm wage and salary income (using a nonstandard classification of occupational choices), but no information was collected on the industrial sector. In other years, information on the off-farm industry was collected in ARMS, but not on the off-farm occupation.

Data

The study's data are from the 2010 ARMS.³ Since 2004, the survey has asked respondents to indicate the industry associated with the off-farm employment of the operator and spouse.⁴ A followup question in 2010 asked for the occupation of the off-farm job. This study's analysis focuses on the principal operator and spouse of family farm households, where both the operator and spouse were present in the 2010 ARMS *and* wage and salary income information was complete. This subsample represents 81 percent of all survey respondents (4,773 households) in Version 1 of the 2010 ARMS.⁵ Weighted, these represent over 1.46 million farm households in the contiguous United States. The national tabulations of occupational types in metropolitan (metro) and nonmetropolitan (nonmetro) areas draw on national occupation data from the Occupational Employment Statistics Program of the Bureau of Labor Statistics (USDOL-BLS, 2010).

The focus on married couples is because research has shown that household resource-allocation decisions are made jointly by married couples operating family farms (El-Osta et al., 2008). Operators with spouses likely face different off-farm employment opportunities and incentives than those without spouses. For more informative comparisons, operators without spouses are therefore excluded, and all statistics reflect the same subsample of married operators and their spouses.

³For more information on the Agricultural Resource Management Survey (ARMS), see the Economic Research Service's ARMS Farm Financial and Crop Production Practices page at <http://www.ers.usda.gov/data-products/arms-farm-financial-and-crop-production-practices.aspx>.

⁴For more information, see the Economic Research Service's Labor Allocations & Age page at <http://www.ers.usda.gov/topics/farm-economy/farm-household-well-being/labor-allocations.aspx>.

⁵The Agricultural Resource Management Survey (ARMS) has several versions, all of which use different questionnaires. Only Version 1 of the 2010 ARMS asked questions about occupations.

Farm Operators and Spouses and Nonfarm Workers: Comparing Occupations and Education

This study compares the shares of occupation types and educational attainment between farm households and the general population separated into metro and nonmetro areas (table 1). Farm households live primarily in nonmetro areas, so differences between nonfarm workers and farm households in nonmetro areas are less likely to reflect differences in available occupations where the populations live.⁶ In 2010, more than one-third of the farm operators and spouses working off farm had management and professional occupations, which is 10.6 percentage points higher than for nonmetro nonfarm workers. Only 10.3 percent of the farm operators and their spouses had occupations classified as sales and office support. In contrast, a quarter of nonfarm workers in nonmetro areas had such occupations.

Arguably, management and professional jobs are more common in metro areas. Therefore, it is noteworthy that the share of farm operators and spouses working at management and professional occupations was 4.3 percentage points higher than for nonfarm workers in metro areas.

We can conclude from table 1, as well as from figures 2 and 3, that farm operators are more likely to hold management and professional occupations than any other occupation. The same is true of their spouses to an even greater degree.

Table 1

Off-farm occupational and educational attainment of nonfarm wage and salary earners

	All metropolitan-area workers	All nonmetropolitan-area workers	Farm households
	<i>Percent</i>		
Occupation			
Management & professional	31.6	25.3	35.9
Services	20.2	21.5	31.9
Sales & office support	28.0	25.0	10.3
Natural resources, construction, & maintenance	7.8	10.1	9.5
Production, transportation, & materials moving	12.4	18.1	12.4
Educational attainment			
Less than a high school diploma	14.7	17.6	9.3
Completed high school	27.4	36.8	37.7
Completed some college	28.0	28.1	27.1
Completed college	29.9	17.5	25.9

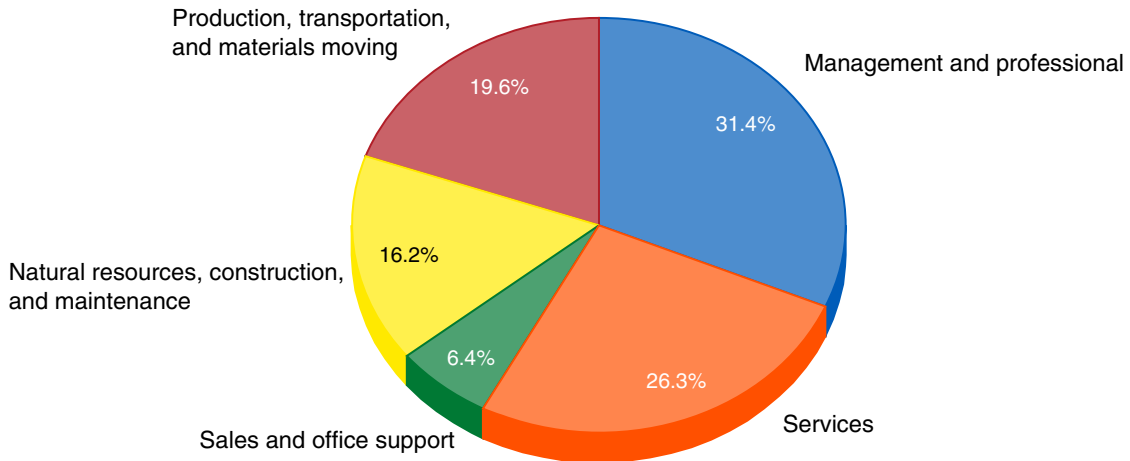
Note: The "Farm households" column refers specifically to the farm operator and spouse, and does not include all household members.

Sources: Area-wide occupation is from the 2010 Occupational Employment Statistics of the Bureau of Labor Statistics. Farm household characteristics are from the USDA's 2010 Agricultural Resource Management Survey (ARMS), Version 1. The subsample only includes family farm households with married couples; sample size = 4,773; farms = 1, 468,962. Operator and spouse responses were totaled across each occupation and educational category. Area-wide educational attainment is from the U.S. Census Bureau's American Community Survey, 5-year average (2006 to 2010). Information on the variances in the non-ARMS statistics were not available to test for statistical differences across the groups.

⁶Metropolitan (metro) and nonmetropolitan (nonmetro) designations are based on the Office of Management and Budget's adoption of the 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas. Metro areas have an urban cluster of at least 50,000 in population. Micropolitan areas have an urban core of at least 10,000, but less than 50,000. Nonmetro is the residual category for places with less than 10,000 in population. About 60 percent of farm households are located in nonmetro areas, and the remainder are in rural portions of metro counties.

Figure 2

Farm operators' off-farm occupations

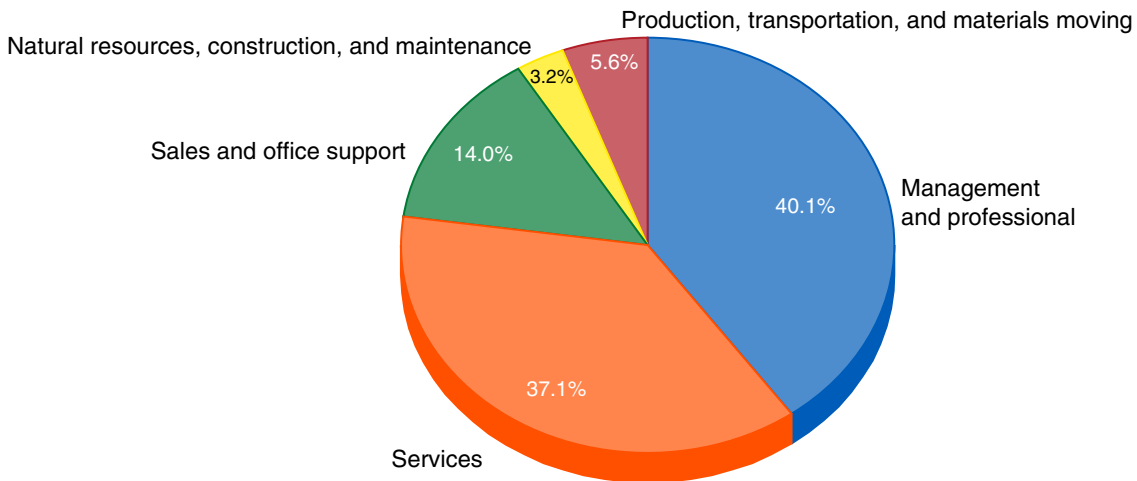


Notes: Subsample used only includes family farm households with married couples. The percentages may not sum to 100% due to rounding.

Source: USDA, 2010 Agricultural Resource Management Survey, Version 1.

Figure 3

Off-farm occupations of the spouses of farm operators



Notes: Subsample used only includes family farm households with married couples. The percentages may not sum to 100% due to rounding.

Source: USDA, 2010 Agricultural Resource Management Survey, Version 1.

There are several possible explanations for why farm operators and their spouses are more likely to have management or professional occupations. First, households with management or professional skills may be more likely to enter the farm population. Their skills may have allowed them to earn high incomes and accumulate enough wealth to begin farming or their skills themselves may have been uniquely suited for managing a farm business. Second, managing a farm may have cultivated

the skills that are valued and required by management and professional occupations. Third, farm operators and their spouses are, on average, older than the U.S. adult population in general (USDA ERS, 2012b). Experience increases with age, which may position the older members of farm households for management occupations.

The statistics on educational attainment (table 1) could also support the explanation that farm households have management and professional occupations because of their experience. Similar to nonfarm workers in nonmetro areas, the most common educational attainment of farm operators and their spouses is high school. However, the share of farm household operators and spouses with a management and professional occupation is more than 10 percentage points higher. Similarly, a greater share of nonfarm workers in metro areas completed college compared to farm operators and spouses, yet the latter group is more likely to work in management and professional occupations. Although education likely complements experience, the hands-on experience gained on the farm may help to compensate for less formal education.

Off-Farm Occupations, Education, and Age

The likelihood of having a management and professional occupation increases with education, suggesting that such occupations indeed require more skills and training than other occupations (table 2). For both farm operators and their spouses, more than half of college graduates had management and professional jobs. In contrast, operators with only a high school education were more likely to work in a production, transportation, or materials-moving occupation. Spouses with only a high school education tended to work in service occupations.

We also analyzed the age distribution of farm operators and spouses in relation to their off-farm occupations. Older people often have more experience, which in turn affects their occupational possibilities. This study splits the sample by age, using 45 as the cutoff point because it represents a mid-career point and the peak of off-farm labor participation among farm operators (El-Osta et al., 2008). (The average ages for operators and spouses in the sample were 58 and 56). Operators and spouses older than 45 reported higher shares of management and professional occupations, which supports the notion that experience opens opportunities for management occupations. In general, however, the differences in occupations across age groups are small. The largest difference is with occupations in natural resources, construction, and maintenance, which employ 22.8 percent of operators 45 or younger versus 14.2 percent of older operators. This difference may reflect the physical demands of these occupations, which become more burdensome with age.

Table 2

Occupation of farm household members employed off farm, by educational attainment and age

	High school	Some college	College degree (BA, BS)	≤ 45 years old	> 45 years old
	<i>Percent</i>				
Operator	(n = 2,786)	(n = 1,745)	(n = 1,726)	(n = 788)	(n = 3,985)
Management & professional	16.9	30.4	56.2	27.9	32.5
Services	22.4	26.6	16.9	24.6	26.8
Sales & office support	3.1	6.0	8.5	7.2	6.2
Natural resources, construction, & maintenance	25.3	18.4	11.5	22.8	14.2
Production, transportation, & materials moving	32.3	18.6	6.9	17.5	20.3
Spouse	(n = 2,151)	(n = 1,591)	(n = 2,737)	(n = 1,003)	(n = 3,770)
Management & professional	20.5	39.2	60.6	38.1	40.9
Services	45.3	39.4	27.0	40.3	35.9
Sales & office support	17.1	14.0	6.0	12.0	14.7
Natural resources, construction, & maintenance	4.6	2.7	3.1	4.6	2.6
Production, transportation, & materials moving	12.5	4.7	3.4	5.0	5.8

Notes: The subsample used only includes family farm households with married couples. Column totals may not sum to 100 percent due to rounding.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

Off-Farm Occupation and Wages

If management and professional occupations require more education and skill than other occupations, we would expect them to pay higher wages. To analyze this, we estimated a wage rate for operators and spouses by dividing their wage and salary income by their reported hours worked off farm during the year (table 3). We found that, on average, management occupations do pay higher wages. The wage gap between management occupations and other occupations is greatest for farm operators. For them, management occupations pay on average \$7 an hour more than the next highest paying occupation (sales and office support) and nearly double that paid by service occupations or those in production, transportation, and materials moving. Although the wage differences are more modest for spouses, management occupations still pay them 21 percent more than the next highest paying occupation.

Table 3

Average hourly wages by occupation (\$/hour)

	Operator	Spouse
Occupation	(n = 1,926)	(n = 2,244)
Management & professional	40	23
Services	22	16
Sales & office support	33	18
Natural resources, construction, & maintenance	26	19
Production, transportation, & materials moving	22	18

Note: Subsample used only includes family farm households with married couples.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

Off-Farm Occupation and Industry

When employed off farm, farm operators principally worked in the construction; agriculture, forestry, fishing, hunting, or mining; or manufacturing industries. Their spouses predominantly worked in education or healthcare services (table 4).

The differences between the off-farm industries (and occupations) of farm operators and their spouses likely reflect differences in household and farm responsibilities, as well as how off-farm employment opportunities complement and meet key household needs. For example, if the operator works on the farm full-time, the household may be able to obtain health insurance through the spouse's job. This may explain, in part, why so many spouses work in the education and healthcare industries, which often offer benefits like health insurance. Complementarity between on-farm responsibilities and off-farm jobs can also shape occupational choices. After education and health care, the next most common industrial sector for the spouse's job is in finance, insurance, real estate, and other professional services. This could partly reflect the accounting responsibilities for the farm's finances that spouses often assume.

Combining industry and occupation data, we use the industries with the two highest shares of participation for both operators and spouses to develop industry-occupation profiles. Table 5 reports occupation shares for operators within the construction and agriculture, forestry, fishing, hunting, or mining industries, and occupation shares for spouses within the education and healthcare services industries.

Operator occupations within the construction industry were mostly in natural resources, construction, and maintenance. Farmers often need mechanical and building skills on the farm, which makes construction a likely off-farm occupation. In addition, farm operators routinely use their trucks and tractors and other heavy equipment to move materials or perform field or other excavating activities for other farmers or businesses (common examples of transportation or materials-moving occupations). Within the agriculture, forestry, fishing, hunting, or mining industry, a third of the operators

Table 4

Industrial sector of off-farm employment for farm household members

	Operator	Spouse
	<i>Percent</i>	
Industrial sector		
Agriculture, forestry, fishing, hunting, or mining	15.3	7.9
Construction	18.7	4.0
Manufacturing	12.9	5.1
Education services	6.4	22.3
Healthcare services	4.7	19.7
Government services	10.2	9.2
Wholesale trade, warehousing, utilities, or transportation	10.8	2.2
Finance, insurance, real estate, or other professional services	6.5	12.7
Recreation or tourism	1.4	1.0
Retail trade or personal services	7.6	11.0
Other nongovernment services	5.6	5.0

Notes: Subsample used only includes family farm households with married couples. Column totals may not sum to 100 percent due to rounding.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

Table 5

Industry-occupation profiles of farm operators and spouses employed off farm

	Construction	Agriculture, forestry, fishing, hunting, or mining
	<i>Percent</i>	
Operator		
Management & professional	13.3 (2.4)	33.9 (5.1)
Services	22.9 (4.1)	26.8 (4.0)
Sales & office support	3.6 (0.7)	6.1 (0.9)
Natural resources, construction, & maintenance	46.4 (8.4)	11.5 (1.7)
Production, transportation, & materials moving	13.9 (2.5)	21.7 (3.2)
	Education services	Healthcare services
Spouse		
Management & professional	60.8 (13.3)	37.1 (7.1)
Services	30.0 (6.6)	54.3 (10.5)
Sales & office support	3.3 (0.7)	6.4 (1.2)
Natural resources, construction, & maintenance	4.3 (0.9)	0.4 (0.1)
Production, transportation, & materials moving	1.6 (0.4)	1.9 (0.4)

Notes: Subsample used only includes family farm households with married couples. Numbers in parentheses are the percentages of all industry-occupation types in the sample. Column totals may not sum to 100% due to rounding.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

have management and professional occupations (which can include managing farm-related businesses such as trucking or custom harvesting).

Among spouse industry-occupation profiles, management and professional occupations and service occupations were most common in education services. Typical examples of these occupations include teachers, school administrators, administrative staff, and teachers' aides. Services and management and professional occupations accounted for the largest shares of spouse employment in healthcare services. Examples of service occupations in healthcare include nurses (nonregistered) and any type of medical aide, assistant, or transcriptionist. Possible management and professional occupations in the sector are doctors, pharmacists, registered nurses, or clinic managers.

Farm Size and Off-Farm Industry and Occupation

Farms of different sizes have different skill and labor needs, which affect the incentives and opportunities for farm operators and their spouses to work off farm. As farm size increases, off-farm income contributes less to total household income (USDA ERS, 2012a). We split the farm households in the study group into three sales categories based on the annual gross sales of their farms (table 6): less than \$50,000 in sales (75 percent), \$50,000 to \$249,999 in sales (14 percent), and \$250,000 and above in sales (11 percent).

The operators of farms with less than \$50,000 in sales reported higher shares of employment in the construction and manufacturing industries. For larger farms, operators mainly worked in the agricultural, forestry, fishing, hunting, or mining industry—these operators (who have farms with substantial crop or livestock production) likely possess an advantage in off-farm jobs in agriculture. The industry sectors of spouses' off-farm jobs were similar across different-sized farms. In all three farm-size cate-

Table 6

Industry types for operators and spouses employed off farm, by farm size

	Size of farm (annual farm sales)		
	< \$50,000	\$50,000 - \$249,999	\$250,000 or more
	<i>Percent</i>		
Operator			
Agriculture, forestry, fishing, hunting, or mining	12.9	26.5	35.3
Construction	19.7	14.7	9.0
Manufacturing	13.2	12.7	6.6
Education services	6.2	7.0	8.9
Healthcare services	5.3	1.6	1.3
Government services	10.4	7.3	13.4
Wholesale trade, warehousing, utilities, or transportation	10.8	12.0	5.9
Finance, insurance, real estate, or other professional services	6.7	5.3	6.8
Recreation or tourism	1.6	0.2	0.0
Retail trade or personal services	7.7	6.6	8.1
Other nongovernment services	5.6	6.1	4.8
Spouse			
Agriculture, forestry, fishing, hunting, or mining	6.9	9.9	12.1
Construction	4.3	3.8	2.2
Manufacturing	6.1	2.3	2.0
Education services	22.0	21.4	25.3
Healthcare services	20.0	18.9	19.0
Government services	9.1	9.9	8.9
Wholesale trade, warehousing, utilities, or transportation	2.0	2.1	3.6
Finance, insurance, real estate, or other professional services	12.9	11.7	12.1
Recreation or tourism	0.9	1.3	0.6
Retail trade or personal services	11.1	12.6	8.8
Other nongovernment services	4.7	6.2	5.6

Notes: Subsample used only includes family farm households with married couples. Column totals may not sum to 100 percent due to rounding.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

gories, the education and healthcare services sectors accounted for the largest shares of off-farm jobs held by spouses. This is logical because spouses working off farm are less likely to be as involved with day-to-day farm work and management, unless they serve as a secondary operator.

Both operators and spouses associated with larger farms were more likely to have management and professional occupations than those associated with smaller farms (table 7). Households operating larger farms generally possess the management skills to run a financially viable business—skills likely to be valuable in off-farm employment. Operators of the smallest farms we examine held management and professional jobs at about the same rate as U.S. workers in general, while the operators of larger farms held jobs in this occupational category at progressively higher rates (fig. 4).

Differences in education between operators and spouses operating larger farms versus smaller farms may also help explain differences in the distribution of off-farm occupations. Completion of high school is the most common level of educational attainment for both operators and spouses across all farm sizes, with the exception of spouses on farms with sales of \$250,000 or more (table 8). However, the share of operators having completed college was the highest for farms with sales of \$250,000 or more. This may help explain why management and professional occupations were more common among operators and spouses running larger farms (as reported in table 5). It also suggests that formal education matters for managing a larger farm in contemporary U.S. agriculture.⁷

Among farm operators, educational attainment does not consistently increase between small and medium-sized farms, however. Operators with at least some college account for 51.6 percent of operators of the smallest farms we examined; the same is true for 45.5 percent of operators in our

Table 7

Occupation of farm operators and spouses employed off farm, by farm size

	Size of farm (annual farm sales)		
	< \$50,000	\$50,000 - \$249,999	\$250,000 or more
	<i>Percent</i>		
Operator			
Management & professional	30.3	35.0	44.4
Services	26.3	26.8	24.4
Sales & office support	6.2	7.0	9.5
Natural resources, construction, & maintenance	17.4	8.1	13.8
Production, transportation, & materials moving	19.8	23.0	7.9
Spouse			
Management & professional	39.5	40.5	43.7
Services	37.0	39.7	34.6
Sales & office support	14.5	12.0	13.1
Natural resources, construction, & maintenance	3.3	3.2	2.7
Production, transportation, & materials moving	5.8	4.6	5.9

Notes: Subsample used only includes family farm households with married couples. Column totals may not sum to 100 percent due to rounding.

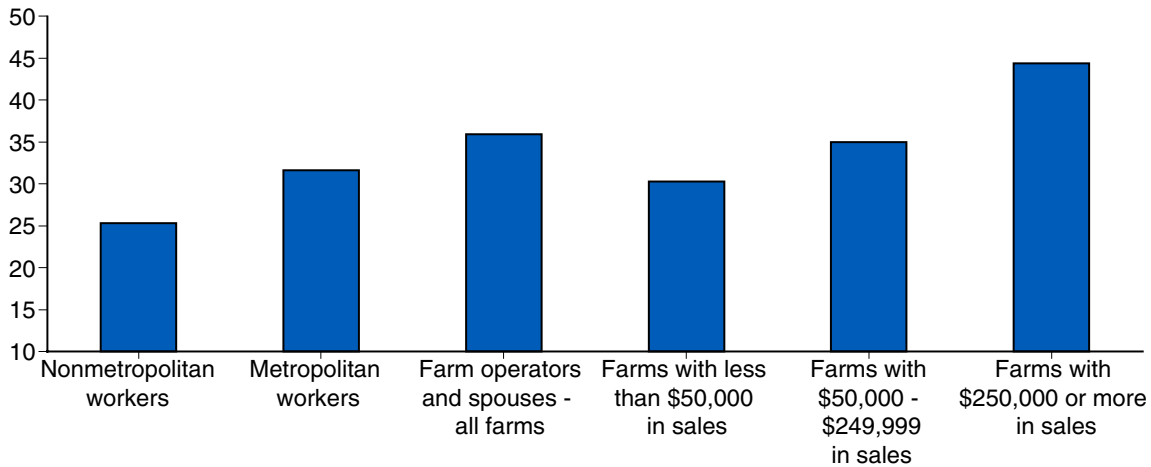
Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

⁷The fact that nearly as many small farm operators have college degrees is more likely to reflect their off-farm occupational goals rather than the educational requirements of running a small farm.

Figure 4

Share of workers in off-farm management and professional occupations, 2010

Percent with management and professional occupations



Note: The subsample of farms includes only family farm households with married couples where the operator or spouse works off farm. Occupation by farm size refers to the occupation of the farm operator.

Sources: USDA, Economic Research Service using the 2010 Occupational Employment Statistics of the Bureau of Labor Statistics for area-wide occupations and USDA's 2010 Agricultural Resource Management Survey, Version 1 for farm household member occupations.

Table 8

Educational attainment of farm operators and spouses employed off farm, by farm size

	Size of farm (annual farm sales)		
	< \$50,000	\$50,000 - \$249,999	\$250,000 or more
	<i>Percent</i>		
Operator			
Some high school or less	10.7	13.1	6.8
Completed high school	37.6	41.4	34.9
Some college	26.5	24.2	30.4
Completed college (BA, BS)	25.1	21.3	27.9
Spouse			
Some high school or less	8.0	10.6	4.3
Completed high school	39.4	34.7	28.3
Some college	26.2	29.5	34.7
Completed college (BA, BS)	26.5	25.3	32.7

Notes: Subsample used only includes family farm households with married couples. Column totals may not sum to 100 percent due to rounding.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

mid-sized farm category. This may reflect cases where higher education allows a household to accumulate the wealth that gives it the financial flexibility to enter farming in a small way, primarily as a second career or as part of retirement.

Smaller farms have less labor demands, allowing farm households to allocate more labor to off-farm employment. Certain occupations may also provide the flexibility often needed by farm operators

and their spouses. Estimates of the average annual hours worked off farm for operators and spouses are reported for each occupation category by farm size in table 9. The distribution of operator hours in their off-farm jobs is fairly uniform across occupations—as expected, the average number of hours worked off farm decreases with farm size. However, operators on farms with less than \$50,000 in sales, and who had production, transportation, or materials-moving occupations, reported working more hours on average than operators of similar-sized farms with other occupations. Similarly, operators of farms with sales of \$250,000 or more, who had management and professional occupations, reported working more hours on average than operators of similar-sized farms with other occupations.

Estimates of annual hours for spouses who worked off farm are also fairly uniform across occupations. The average annual hours for spouses were highest in natural resource, construction, and maintenance occupations for households operating farms with less than \$250,000 in sales. Spouses in households operating farms with \$250,000 or more in sales reported much lower numbers of hours worked off farm.

Table 9

Average annual labor hours worked at off-farm jobs, by farm size and occupation (hours/year)

	Size of farm (annual farm sales)		
	< \$50,000	\$50,000 - \$249,999	\$250,000 or more
Operator			
Management & professional	1,806	1,458	1,333
Services	1,599	1,865	1,217
Sales & office support	1,839	1,409	1,168
Natural resources, construction, & maintenance	1,896	1,593	1,194
Production, transportation, & materials moving	2,147	1,873	1,059
Weighted average across all occupations	1,832	1,664	1,241
Spouse			
Management & professional	1,341	790	219
Services	1,351	1,145	118
Sales & office support	1,302	766	236
Natural resources, construction, & maintenance	1,579	1,474	97
Production, transportation, & materials moving	1,329	638	241
Weighted average across all occupations	1,346	910	222

Notes: Subsample used only includes family farm households with married couples. The annual estimate is derived using the sum of the average hours worked off farm in each quarter multiplied by the number of weeks in each quarter.

Source: USDA's 2010 Agricultural Resource Management Survey, Version 1.

Conclusion

Many farms have little agricultural production, so it is not surprising that many farm operators and their spouses have off-farm jobs. It is also not surprising that the most common off-farm occupation is in a management or professional position. This finding is consistent with the reality that even farm households with little production have substantial wealth, which suggests that, as a group, they have historically had high nonfarm incomes.

The study's key finding, however, reflects more than the prevalence of high-income professionals with a farm that barely has enough agricultural activity to meet the definition of a farm (e.g., having several horses). The skills required to manage a profitable farm in the United States have arguably increased with the advent of sophisticated production and information technologies and approaches to managing the risks of volatile prices and weather. Consistent with the notion that farming requires substantial management skills, operators and spouses associated with large farms had the highest participation in professional and management occupations when working off farm.

Knowledge of the off-farm occupations of farm operators and their spouses is helpful in understanding past trends in farm household well-being, and hints at future off-farm job opportunities for those running successful farm businesses. The prevalence of management and professional occupations may help explain recent changes in the income of farm households compared to U.S. households in general. While other factors, such as changes to unearned income or the composition of the farm population, may also play a role, this report suggests that the labor of the typical farm household is more skilled than that of the typical U.S. household. Combined with a growing disparity between the wages for skilled and unskilled labor, evidence of higher skills among farm households provides one explanation for their relatively better income growth. Looking forward, the evidence that the skills required to operate a successful farm business may also influence off-farm job opportunities suggests that as farm businesses continue to become more complex, the evolving skills and adaptability needed to operate larger farms may further influence off-farm job prospects. Off-farm job prospects, in turn, can be important to farm operators and their spouses since nonfarm income can be a viable risk-adaptation strategy for farm households heavily invested in agricultural production.

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Appendix: Industry and Occupation Questions From the Agricultural Resource Management Survey

Respondents answered the following sequence of questions in the 2010 ARMS:

(i) Which business code represents the type of off-farm business you and/or your spouse worked at?

1 = Agriculture, forestry, fishing, hunting, or mining

2 = Construction

3 = Manufacturing

4 = Education services

5 = Healthcare services

6 = Other government services

7 = Wholesale trade, warehousing, utilities or transportation

8 = Finance, insurance, real estate, information, or other professional services

9 = Recreation or tourism, including eating and lodging

10 = Retail trade or personal services

11 = Other nongovernmental services

(ii) Which occupational code represents the type of job you and/or your spouse had at this off-farm business?

1 = Management and professional

2 = Services

3 = Sales and office support

4 = Natural resources, construction, and maintenance

5 = Production, transportation and materials moving

6 = Military

The distinction between industry and occupation is that workers can conceivably be in one of the occupations listed within most industry types. Examples of occupation types by each category are provided below.^{8,9}

Management, professional, and related occupations include the following occupational categories:

(i) management, (ii) business and financial, (iii) computer and mathematical, (iv) architecture and engineering, (v) life, physical, and social sciences, (vi) community and social services, (vii) legal,

⁸The occupation categories conform to the revised Standard Occupation Code (SOC) announced in SOC Federal Register Notice September 30, 1999, published by the Office of Management and Budget (http://www.bls.gov/soc/soc_sept.htm).

⁹All Federal agencies collecting occupational data are required to use these categories for the highest aggregation level (6 categories) of occupational data. The 2010 Standard Occupation Code revised some of the detailed occupations, but the aggregation schemes remain unchanged (e.g., <http://www.bls.gov/soc/classification2010.htm>). See also "Federal Register Notice, January 21, 2009" (<http://www.bls.gov/soc/soc2010final.pdf>).

(viii) education, training, and library, (ix) arts, design, entertainment, sports, and media, and (x) healthcare practitioner and technician.

Services occupations include the following occupational categories: (i) healthcare support (such as nursing and all types of healthcare-related assistants and aides), (ii) protective service, (iii) food preparation and serving, (iv) building and grounds cleaning and maintenance, and (v) personal care and service.

Sales and office support occupations include the following occupational categories: (i) sales and related (such as retail and wholesale sales occupations, including first-line supervisors; real estate brokers and sales agents; advertising sales; insurance, securities, and commodity sales; and sales representatives of all types) and (ii) office and administrative support (such as office supervisors and administrative support staff, communication equipment operators, and clerks of all kinds – financial, information, service-processing, record-keeping, production, shipping and receiving, and postal and courier).

Natural resources, construction, and maintenance occupations include the following categories: (i) farming, fishing, and forestry occupations, (ii) construction trades, laborers, operators, and supervisors, (iii) mining extraction workers, and (iv) installation, maintenance, and repair occupations of all types.

Production, transportation, and materials-moving occupations include the following categories: (i) first-line supervisors and workers in production (such as assemblers; food processors; metal and plastic workers; machine tool-related workers; chemical, printing, textiles, and woodworkers; and all types of plant and system operators) and (ii) transportation – all land, air, and water transport of people and goods, and materials-moving occupations (such as refuse and recycling, dredging, and excavation).

Military occupations include the following categories: (i) military officer (special and tactical operations leaders), (ii) first-line enlisted military supervisors, and (iii) military enlisted tactical operations and air/weapons specialists and crew members. Information on military occupations was not covered in this report because of the small number of ARMS respondents reporting this occupation.