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Stephen Vogel

Abstract

Almost a third of U.S. farm households generate income by engaging in business ventures independent of commodity production, with distinctly different community and household benefits. In 2007, 686,600 farm households engaged in 791,000 income-generating activities distinct from commodity production, creating $26.7 billion in household income. Onfarm diversification activities like agritourism and off-farm business ventures each accounted for about half of these activities, but off-farm businesses generated about 80 percent of total alternative (i.e., noncommodity) business income earned by farm households, creating the largest impact on the local economy. Off-farm businesses operated by farm households contributed an estimated $54.6 billion in value-added income to the gross regional products of their local economies and paid out $24.5 billion in wages and salaries to 853,100 part-time and full-time employees. In general, the share of the local employment base accounted for by farmer-owned off-farm businesses was higher in more rural counties.

Keywords: onfarm diversification, off-farm businesses, portfolio entrepreneur, farm household typology, nonfarm employment, direct sales

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Danny Klinefelter (Texas A&M University), Patrick Sullivan (Economic Research Service), and two anonymous reviewers provided valuable comments and suggestions, while Angela Anderson and Cynthia A. Ray provided editorial and design support.

Contents

Summary

What Is the Issue?

Farm operators and their households have a choice in how their entrepreneurial and managerial skills are used to earn business income. They can focus on traditional commodity production, use farm resources to produce other (noncommodity) goods and services, or operate an off-farm business in addition to their onfarm activities. Close to a third of U.S. farm households generate income by engaging in off-farm business ventures and onfarm activities independent of commodity production. The latter, referred to as onfarm diversification activities, range from operating agritourism ventures to supplying forest products to selling output at farmers' markets. Farm operators also may own off-farm businesses, which face fluctuating conditions in the economy. Average off-farm business income earned by farm households was $63,800 in 2001, peaked at $76,800 in 2006, and fell to $42,700 in 2008.

What Did the Study Find?

In 2007, close to a third of all U.S. farm households—or 686,600 farm households—engaged in 791,000 income-generating activities distinct from commodity production, creating $26.7 billion in household income. Onfarm diversification activities and off-farm business ventures each accounted for about half of these income-generating activities, but off-farm businesses had the largest impact on the local economy by generating about 80 percent of total noncommodity business income earned by farm households.

The farms operated by households engaged in alternative (i.e., noncommodity) entrepreneurial activities produced almost 40 percent of the total value of U.S. agricultural production in 2007. This suggests that households associated with farms of all sizes engage in alternative entrepreneurial activities, not just those associated with "part-time" or "hobby" farms.

Over 290,000 farm households engaged only in onfarm diversification activities in 2007, earning approximately $14,400 per farm from these activities. Custom work, direct-to-consumer sales of local foods, and agritourism activities like pick-your-own operations accounted for almost 90 percent of the total amount of income earned from onfarm diversification activities. The type of commodities grown on the farm and the farm's location relative to urban markets influenced participation in these activities. Farm households engaged in onfarm diversification devoted almost 50 percent more operator work time to the farm than did farm households not engaged in such activities.

Onfarm diversifying households tended to operate larger farms, averaging over 660 acres, and were twice the average size of farms not engaged in any alternative entrepreneurial activity. Farm households engaged in onfarm diversification appeared to use their larger physical asset base more intensively to support their onfarm business ventures.

In 2007, 395,600 U.S. farm households operated an off-farm business. Multi-enterprise farm households typically earn incomes above those of farm households not engaged in these activities; portfolio entrepreneur households—those operating off-farm businesses in addition to their farms—earned incomes ($140,200 per year) nearly twice the average for farm households not engaged in alternative income-generating business activities ($72,610) in 2007.

Off-farm businesses operated by farm households generate strong links to the nonfarm economy. In 2007, off-farm businesses generated $21.6 billion in profits based on estimated sales of $111.6 billion, contributed an estimated $54.6 billion in value-added income to the gross regional products of their local economies, and paid out $24.5 billion in wages and salaries to 853,100 part-time and full-time employees. Excluding sole proprietors, off-farm businesses employed six workers, on average, from local nonfarm labor markets.

The share of a nonmetro county's employed labor force linked to farm household-operated businesses increases at greater distances from an urban core. In 2007, jobs directly linked to such off-farm businesses accounted for 0.2 percent of the employed labor force in metro counties, 1.6 percent in micropolitan counties (urban populations of 10,000-50,000), and almost 2.4 percent of employment in noncore counties (urban centers of less than 10,000).

How Was the Study Conducted?

Most of the data in this report came from the 2007 Agricultural Resource Management Survey (ARMS), which was supplemented with data from earlier and subsequent ARMS, and from the 2007 Census of Agriculture. The 2007 ARMS data were the most current data available when this research was initiated. In addition, 2007 was the most recent data that realistically could portray pre-Great Recession economic conditions while not being dominated by the economic bubble leading up to the recession. ARMS is a detailed, annual survey of farm businesses and associated households conducted jointly by the U.S. Department of Agriculture's Economic Research Service (ERS) and National Agricultural Statistics Service (NASS). This report also uses the direct coefficients of the 2002 benchmark input-output tables published by the U.S. Department of Commerce's Bureau of Economic Analysis.

Introduction: Why Are Multi-Enterprising Farmers Important?

Historically, many U.S. farm households have engaged in other income-generating activities independent of commodity production to support their lifestyles and to help maintain the economic viability of their farm operations. Full-time farming has long been the exception rather than the rule; most U.S. farm operators have supplemented farm income by working off the farm (Fuller, 1991).[1] Almost 75 percent of U.S. farm households currently have at least one member working in an off-farm job. Multiple jobholding, particularly among small farm operators, is not transitional, but represents a stable path of income generation compatible with the household's choice to combine rural and farming lifestyles (Bartlett, 1986).

[1]Chayanov (1926) first described peasant households in early 20th century Russia moving in and out of labor markets while continuing to farm. Hill's (1982) historical account of supplementary farm incomes in the United Kingdom also finds this to be the case.

Another important income-generating activity available to the farm household is to operate a business venture separate from commodity production. About a third of U.S. farm households earn business income by doing so. These business ventures are classified into two broad categories distinguished by the degree to which farm resources are employed or leveraged.

- *Onfarm diversification*: a form of joint production that extends income-generating farm activities from simple crop production to monetizing the value of amenities and other attributes of farmland resources and lifestyles. These activities range from supplying forest products to operating agritourism ventures to selling output at farmers' markets. (See box, "Measuring Farmer Participation and Income from Alternative Entrepreneurial Activities" for a description of the onfarm diversification activities discussed in this report.)
- *Portfolio entrepreneurs*: farm households operating off-farm businesses in other sectors of their local economy.[2]

[2]Simultaneously operating two or more distinct businesses classify these farmers as "portfolio entrepreneurs" in the economics literature on small businesses. Carter (1996, 1998, 1999) and Alsos and Carter (2007) identified "portfolio entrepreneurship" among farm households in British and Norwegian case studies.

The term "multi-enterprising farm household" refers to farm operators or other members of the farm household who operate business ventures in one or both of these two categories. Data from Phase III of the Agricultural Resource Management Survey (ARMS) sheds light on the scope and complexity of these noncommodity enterprises and the farm households that engage in them.

How Community Linkages Created by Multi-Enterprising Farm Households Differ From Other Farm-Based Linkages

Traditionally, the types of farm households and the size and structure of their farm operations have defined the extent and magnitude of the economic relationships between farmers and their local communities. More recently, farm and farm household activities have been recognized as being more complex, whereby farm production, farm household consumption, and all household income-earning activities generate distinct footprints in the local economy (Johnson et al., 2008). Three earned income sources—commodity production, off-farm employment, and alternative business ventures—engender unique community linkages, particularly because the community impacts of noncommodity business ventures differ from those generated by commodity production or off-farm employment.

Measuring Farmer Participation and Income From Alternative Entrepreneurial Activities

On-farm diversification is a term first used in European case studies documenting how farmers use farm resources to develop new ventures that generate additional farm income (Gasson, 1988; Ilbery, 1991; Shucksmith, 1993). Farm-level economies of scope permit farmers to develop these alternative onfarm activities independent of commodity production.

The 2007 Agricultural Resource Management Survey (ARMS)—administered annually by ERS and the National Agricultural Statistics Service (NASS)—asked farmers to report income from farm-related sources, including Government program payments, crop and livestock insurance payments, proceeds from the sales of farmland, other farm real estate, and capital equipment, as well as income from alternative onfarm ventures. For our purposes, those activities include:

- Custom work—farmers rent out their technical skills and farm equipment to other farm operations;
- Agritourism—guided farm or ranch tours and other entertainment services, hospitality services, and outdoor recreation (e.g., hunting, fishing, and bird watching);
- Sale of forest products, such as firewood and timber;
- Direct-to-consumer sales of food commodities—sales through farmers markets, onfarm stores, roadside stands, and pick-your-own operations;
- Sale of value-added goods produced on the farm, such as jellies and jams, sauces, and other prepared items; and
- Sale of food commodities through community-supported agriculture (CSA) buying clubs—a marketing arrangement in which a group of households agree to purchase shares of a farmer's expected yield before planting; the up-front cash payments allow the farmer to buy inputs and share the output and yield risks with CSA members. These arrangements are also referred to as "subscription agriculture."

If farmers undertake any of these onfarm diversification activities as part of their farm business, ARMS collects information on the income earned from each activity. If these activities are undertaken by the farm household as part of a separate off-farm business, however, detailed information is not collected but aggregate information is requested on off-farm business income. Since 2005, ARMS questionnaires have asked farmers to report the industrial classification of any off-farm businesses they operate. Farmers chose among 10 industrial categories that include agriculture and other resource industries, construction, manufacturing, and 7 service-sector categories. Since 2006, farmers have also been asked to report how many employees worked in their off-farm businesses.

Commodity production generates demand for farm inputs, as well as large-scale processing and marketing channels for farm output. These demands are supplied by a local or regional set of agriculturally related industries. For the first 60 years of the 20th century, these economic relationships formed the core of many rural communities' economic bases. As production agriculture has became more concentrated among fewer farmers over the last 50 years, however, these local economic linkages have been weakened as farmers increasingly bypassed local suppliers to purchase inputs (Stenberg et al., 2009).

Over this same period, many rural communities found new sources of economic growth by developing nonfarm business sectors. Today, the manufacturing, Government, and service sectors (or a mixture of all three) account for the largest share of the economic bases of all but the most agriculturally oriented rural communities.[3] This economic diversification has created more off-farm employment opportunities such that the average farm household's prosperity now depends more on the state of the local economy than on farm production. This dependence is captured in the often cited aphorism, "The rural economy is more important to farmers than farmers are to the rural economy" (Irwin et al., 2010).

In contrast, multi-enterprising farmers create important but different benefits for the local economy. Onfarm diversification ventures, such as farm recreation, farm stores, and pick-your-own-produce, attract visitors' dollars to the local community (Brown and Reeder, 2007). Off-farm businesses operated by farm households contribute directly to the local community's nonfarm economic base by employing workers from the local labor force and by increasing the community's stock of physical wealth.

[3]Since first elucidated by Lewis (1954), the distinction between farm and nonfarm economic activities has always been central to theories of economic development. Hirschman (1958) used this dichotomy to suggest that developing countries import whole industries because agriculture's linkages were too weak. Jacobs (1984) stressed that in developed countries the urban core needed an integrated, diversified rural economy for the overall regional economy to thrive. The changing foci and complexity of U.S. rural development strategies over the last few decades are summarized by Irwin and others (2010). These strategies mirror the cross-currents facing those rural communities in which links to agriculture no longer dominate and whose economies have become more integrated into their broader regional economies or have remained stagnant.

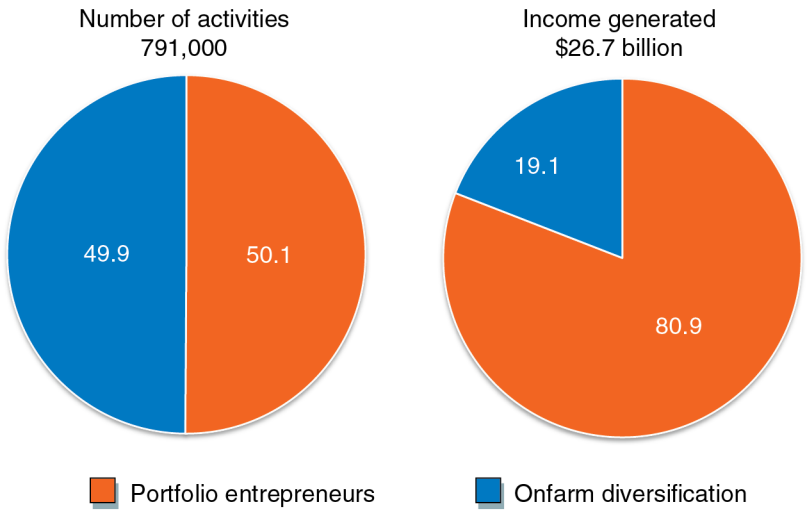
The Multi-Enterprising Farmer

In 2007, farm households engaged in 791,000 distinct alternative (to farm commodity-based) entrepreneurial ventures that generated an additional $26.7 billion in household income. Onfarm diversification and off-farm business ventures each accounted for about half of these activities, but off-farm business ventures generated more than 80 percent of the multi-enterprise, noncommodity business income accruing to farm households (fig. 1).

In 2007, close to a third of all U.S. farm households—or 686,600 farm households—were engaged in alternative entrepreneurial activities (table 1). The farms operated by these households produced almost 40 percent of the total value of U.S. agricultural production, suggesting that households associated with farms of all sizes engage in alternative entrepreneurial activities, not just those associated with "part-time" or "hobby" farms. Over 290,000 multi-enterprising farm households engaged only in onfarm diversification activities, earning approximately $14,400 per household from these activities. Onfarm diversifying households tended to operate larger farms, averaging over 660 acres, and were twice the average size of the farms not engaged in any alternative entrepreneurial activity. Farm households engaged in onfarm diversification appeared to use their larger physical asset base more intensively to support their onfarm business ventures, confirming the findings by Gasson (1988), Ilbery (1991), and Shucksmith (1993) that onfarm entrepreneurial ventures were positively related to farm size.

In 2007, 395,600 farm households were classified as portfolio entrepreneurs operating off-farm businesses (table 1). Although multi-enterprising farm households typically earned incomes above those of farm households not engaged in these activities, portfolio entrepreneur households earned

Figure 1
Multi-enterprise farm activities, 2007



Note: Nonfamily farms are excluded.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

the highest household incomes at $140,200 per year, on average. Portfolio entrepreneurs generated $54,650 in income from their off-farm businesses. Fourteen percent of farm portfolio entrepreneurs also operated an onfarm diversification venture, earning an additional $16,200 per year, on average.

Multi-enterprising households differ in terms of the operator's years of experience working the farm and time committed to the farm operation. Portfolio entrepreneurs averaged almost 4 years less farm operator experience than other farm operators (table 1). As measured by full-time equivalent (FTE) employment, farm households engaged in onfarm diversification devoted almost 50 percent more operator work time to the farm,[4] or an average of 1.4 FTEs, while farm households not engaged in such activities and portfolio entrepreneur farm households typically committed approximately 0.9 FTEs to the farm operation. This labor intensity includes the number of hours worked by all operators involved in running the farm business.

If 347,900 farm households engaged in 395,000 onfarm diversification activities, then some farm households engaged in more than one type of onfarm venture (table 1). About 12 percent of farm households participated in two or more onfarm ventures. About 16 percent of farm portfolio entrepreneurs

[4]One full-time equivalent (FTE) job is equal to 2,000 hours or 50 weeks of full-time work annually.

Table 1
Characteristics of multi-enterprising farm households, 2007

Basic characteristics	Commodity-oriented producers	Multi-enterprising farmers: Onfarm diversification	Multi-enterprising farmers: Operate another business	All farms
Number of operator households	1,467,503	291,047	395,583	2,154,133
Percent of total	68.1	13.5	18.4	100.0
Average acres operated	318	664	388	378
Value of farm production ($ millions)	147,835	56,150	39,857	243,842
Percent of total	60.6	23.0	16.3	100.0
		Dollars		
Average household income	72,610	74,807	140,218	85,325
Average multi-enterprise income	–	14,401	57,025	38,800
Average onfarm diversification income*	–	14,401	16,212	14,694
Average off-farm business income*	–	–	54,651	54,651
Years of experience as an operator	26.3	27.0	22.5	25.7
Full-time equivalent operator jobs per farm (total operator hours/2000)	0.9	1.4	0.8	1.0
Number of farm households engaged in on-farm diversification activities	–	291,047	56,841	347,888
Number of onfarm activities	–	327,556	67,410	394,966
Percent of multi-enterprising farm households engaged in:				
One onfarm activity	–	88.3	83.6	87.6
Two or more onfarm activities	–	11.7	16.4	12.4

– denotes zero observations or not applicable.
* Average income based on farm households engaged in the activity.
Note: Data do not include nonfamily farms.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

engaged in more than one onfarm diversification activity—a larger share than for farm households pursuing only onfarm diversification.

The Importance of Alternative Business Ventures for Small and Large Family Farms

According to the 2007 ARMS, multi-enterprising farm households operated all types and sizes of farm businesses, but participation in onfarm and off-farm activities varied by farm type (see box, "ERS Farm Categories" for a description of the farm types discussed in this report). Sixty percent of multi-enterprising farm households operated rural residence farms, 28 percent operated intermediate farms, and only 12 percent operated a commercial family farm with gross sales of $250,000 or more (fig. 2).

Even though multi-enterprising farm households operating rural residence farms were the most numerous, participation rates were higher among households operating intermediate and commercial farms (fig. 2). Twenty-nine percent of all rural residence farm households engaged in multiple enterprises, compared with 37 percent of intermediate and 40 percent of commercial farm households. Intermediate farm operators were nearly twice as likely and commercial farm operators were nearly three times as likely as rural residence farm operators to engage in onfarm diversification. Economies of scale in production on larger farms allow operators to use their natural, physical, and capital resources to generate income from ancillary onfarm activities.

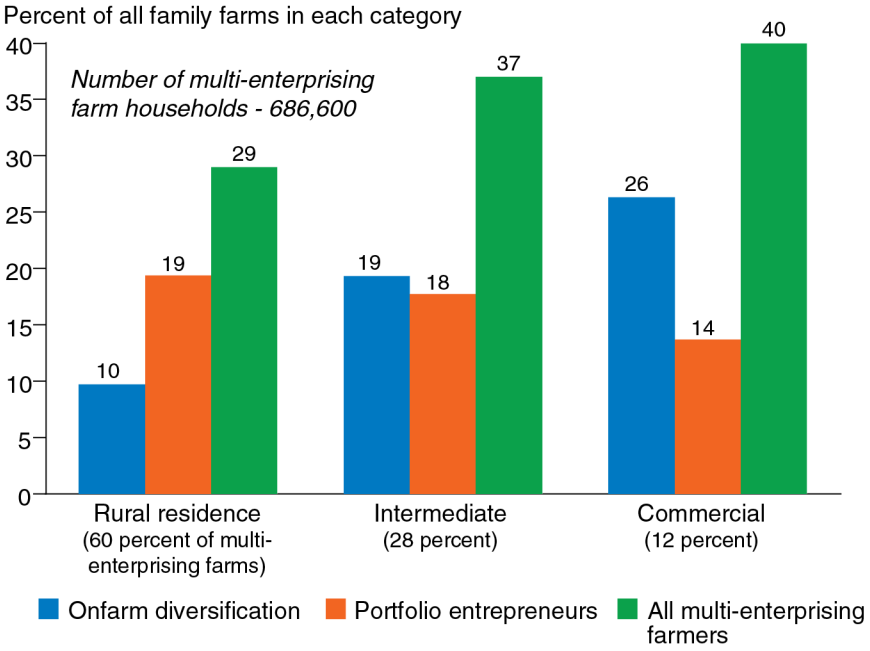
For multi-enterprising farm households as a group, off-farm business income was by far the largest source of noncommodity-based business income earned, accounting for 80 percent of the $26.7 billion in alternative business income reported by farmers in 2007 (fig. 3). While onfarm diversification figures prominently among households operating intermediate and commercial farms, operating an off-farm business accounted for most of the alternative business income earned by households operating rural residence farms.

ERS Family Farm Categories

USDA's Economic Research Service (ERS) categorizes family farms based on gross annual farm sales. Based on standards set by the National Commission of Small Farms, ERS categorized small farms as those that generate less than $250,000 in gross annual sales; large-scale or *commercial* family farms generate gross annual sales of $250,000 or more. Small family farms are further distinguished by the major occupation of the primary operator. *Rural residence* farms are small farms where the operator is retired or lists something other than farming as his or her primary occupation. *Intermediate* farms are small farms where the operator lists farming as his or her primary occupation. Nonfamily farms are those for which the majority of the farm business is not owned by individuals related by blood, marriage, or adoption, and farms run by a hired farm operator. Nonfamily farms were excluded from this analysis. For more information, see http://www.ers.usda.gov/publications/aib-agricultural-information-bulletin/aib759.aspx.

Figure 2

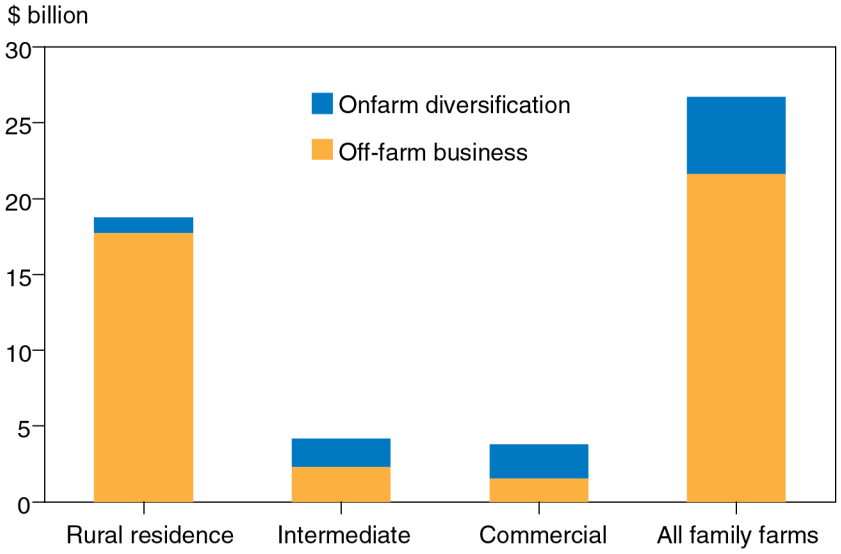
Multi-enterprising farm households, by type of farm household, 2007



Note: Nonfamily farms are excluded.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

Figure 3

Sources of noncommodity-based multi-enterprise income, by type of farm, 2007



Note: Nonfamily farms are excluded.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

The off-farm businesses operated by farm households represent an important, but often overlooked, direct linkage between the farm sector and the local nonfarm economy.[5] What pushes rural residence farm households to become portfolio entrepreneurs? Both supply-side constraints and demand-side conditions are at play. On the supply side, rural residence farmers with excess resources at their disposal may operate a second enterprise when it is not feasible or desirable to expand the farm operation or to operate another farm. This situation arises when key inputs, such as adjacent land, are unavailable or too costly or when the farmers' objectives in operating a farm are not primarily to increase farm profits.

On the demand side, the multi-enterprising farm household may start a nonfarm business if other opportunities appear to be more profitable than more intensive use of farm resources. In rural communities, these opportunities also depend on the degree to which the local economy is thriving. Spatial isolation may diminish the number of entrepreneurial opportunities, while adjacency to metropolitan areas or to thriving micropolitan economies in rural counties may provide incentives for off-farm diversification.[6]

Multi-Enterprising Farmers and Occupational Mobility

Operating alternative onfarm and/or off-farm business ventures increases operator occupational mobility in and out of farming. Traditionally, farm operators exit farming by finding nonfarm employment or by increasing their hours at their current nonfarm job such that the operators' primary occupational status changes from farming to something other than farming. As an alternative, a farm operator can start a nonfarm business and, as it prospers, the operator devotes more time and resources to it such that running the nonfarm business becomes the operator's primary occupation. This process also works in reverse. The primary occupation of a farm operator may be at an off-farm job until the farm operation reaches a scale that requires enough of the operator's time such that farming becomes the primary occupation. Alternatively, the entrepreneurial skills necessary to run an off-farm business may be transferred to onfarm activities such that, over time, farming becomes the farm operator's primary occupation.

Data from the 2004 ARMS showed that farm household entrepreneurship was linked with a change in the occupational status among primary operators. In this survey, operators reported the status of their first and current primary occupations as either farming or nonfarming. Entrepreneurship pathways appear to have affected occupational mobility for residential lifestyle and commercial farm households, while retired and intermediate farm households remained largely unaffected. On average, 82 percent of commercial farm operators always farmed and 88 percent of residential lifestyle farm operators always considered their primary occupation to be in the nonfarm sector (table 2).

The likelihood that the farm operator changed occupational status (either into or out of farming) increased substantially for farm households engaged in off-farm and alternative onfarm business ventures. Among commercial farm households, onfarm diversification and running an off-farm business provided an alternative transitional pathway *into* farming for a small but significant group of farm operators. Seven percent of commercial farm operators not engaged in any alternative business activities switched their primary occupation status from nonfarm to farming (see table 2). Among farm house-

[5]Onfarm business ventures represent a more intensive use of existing onfarm human and physical resources, representing a form of joint production that is difficult to separate from the farm business itself. Conceptually, income from operating another farm business produces the same type of indirect impacts on the nonfarm economy as those of the original farm operation. In contrast, off-farm businesses operated by farm households generate the same direct nonfarm impacts on the local economy as any other local nonfarm business.

[6]A micropolitian county is a new Census Bureau classification category of nonmetropolitan counties with urban population centers of 10,000 residents or more but less than 50,000 residents. The creation of this new category is recognition of and an attempt to measure the urban economic forces in nonmetropolitan counties on a much smaller scale.

Table 2

Occupational mobility of primary operators and their engagement in alternative enterprises, 2004

	Always farming	Transitioned into farming	Transitioned out of farming	Alway nonfarming occupation	Total[1]
First occupation	Farming	Nonfarm	Farming	Nonfarm	
Current primary occupation	Farming	Farming	Nonfarm	Nonfarm	
Residential lifestyle farms:			*Percent*		
No alternative activities	–	–	8.3	91.7	100.0
Onfarm diversification	–	–	14.5	85.5	100.0
Portfolio entrepreneur	–	–	22.6	77.4	100.0
All	–	–	12.1	87.9	100.0
Commercial farms:					
No alternative activities	86.7	7.1	0.5	4.1	98.4
Onfarm diversification	81.4	15.3	1.2	1.2	99.1
Portfolio entrepreneur	70.7	22.9	1.7	3.6	98.9
All	82.5	12.0	0.9	3.3	98.7

[1]Total percentages may not add to 100 because operators of commercial farms who reported their occupational status as "retired" are not included.

– denotes zero observations or not applicable.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2004 Agricultural Resource Management Survey (ARMS) data.

holds engaged in onfarm diversification, just over 15 percent of commercial farm operators held nonfarm jobs before becoming full-time operators. Among portfolio entrepreneurs, almost 23 percent of commercial farm operators worked in a nonfarm position before becoming an operator. In these cases, off-farm business experience may have provided the management expertise the farmer needed to take over the reins of a large farm operation.[7]

For a subset of residential lifestyle farm operators, operating an off-farm or an alternative onfarm venture provided a transitional pathway *out* of farming. While only 8 percent of residential lifestyle farm operators not engaged in any alternative business activity were farmers before establishing their primary occupation in the nonfarm economy, almost 15 percent of alternative onfarm entrepreneurs moved out of farming (see table 2). Among portfolio entrepreneurs, the exit rate from farming as a primary occupation was almost 23 percent for residential lifestyle farm operators.

Operators of an off-farm business appear to be more likely to move into and out of farming, suggesting that their entrepreneurial acumen may be portable across some farm and off-farm enterprises. Movement out of farming for residential lifestyle farm households and movement into farming for commercial farm households indicates that the occupational status of the primary operator changed. ARMS 2004 data did not provide information on the dynamics and the timeframe of occupational transitions or how operating another business played a part in operator choices. Whether the residential lifestyle farm operator ran a commercial farm before downsizing and finally established a primary occupation in the nonfarm economy could not be inferred. Similarly, whether the farmer operated a small farm before operating a large-scale farm could not be inferred from the data. Future research could explore the role of nonfarm business formation among farmers in a changing rural economy.

[7]Very large farms (gross sales of $1,000,000 or more) are complex operations with a portfolio of onfarm diversification ventures and off-farm businesses that provide career opportunities for members of farm households linked to the large farm operation.

The Scope and Complexity of Onfarm Diversification

Among the six different types of onfarm diversification ventures reported in the 2007 ARMS, 154,000 farm households engaged in custom work and 115,000 farm households reported direct-to-consumer sales of local foods, together accounting for 68 percent of all onfarm diversification activities (table 3). The sale of agritourism services, forest products, and farm-produced value-added goods together accounted for 29 percent of the total. Custom work, direct sales, and agritourism activities accounted for almost 90 percent of the total amount of income earned from the onfarm diversification activities examined here.

In 2007, the average farm household engaging in onfarm diversification activities earned an extra $14,700 (table 3). Custom work yielded the highest additional income per farm household, followed by agritourism and the sale of forest products. The lowest average additional income per farm household came through direct sales to consumers and sales of farm-produced value-added goods.

In 2007, 12 percent of farm households capitalized on the complementary nature of these onfarm ventures by engaging in more than one of them. Almost 75 percent of farms in community-supported agriculture (CSA) arrangements and 50 percent of farm households engaged in sales of farm-produced value-added goods participated in at least one other onfarm activity

Table 3
Onfarm diversification activities reported by farm households, 2007

Type of activity	Activities performed	Average income per farm	Average income per farm	Farms engaged in more than one activity
	Number (percent)	*Millions of dollars (percent)*	*Dollars*	*Percent*
TOTAL	394,966 (100)	5,104.1 (100.0)	14,694	11.9
Custom work	154,465 (39.1)	2,631.0 (51.5)	17,033	10.3
Direct sales to consumers	115,465 (29.2)	1,291.5 (25.3)	11,185	24.5
Agritourism	39,307 (10.0)	599.6 (11.7)	15,255	20.2
Farm-produced value-added goods	38,405 (9.7)	209.6 (4.1)	5,457	50.7
Sale of forest products	37,415 (9.5)	449.1 (8.8)	12,004	30.6
Sales through CSAs	9,909 (2.5)	na	na	72.6

CSAs = Community-supported agriculture arrangements.
na= Not available.
Note: Data exclude nonfamily farms.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

(see table 3). Farmers engaged in custom work or agritourism were less likely to engage simultaneously in another activity. For many of these farmers, direct-to-consumer sales of local foods represented an important complementary link supporting the economic viability of their onfarm ventures. According to the 2007 Census of Agriculture, 38 percent of all CSA farms also marketed output through direct-to-consumer marketing channels and 44 percent of them sold farm-produced value-added goods. King et al. (2010) documented case studies of fruit, vegetable, dairy, and livestock producers interlinking these activities with various forms of direct marketing of local foods. Martinez et al. (2010) used data from the 2007 Census of Agriculture to show that farmers with sales of less than $50,000 who bundled additional onfarm activities with direct sales of local foods captured farm resource synergies that also generated additional local food sales income.

Custom work exhibited the fewest attributes that could be linked to other onfarm activities; 12 percent of these farmers also operated another onfarm business venture (see table 3). Farmers engaged in custom work rent out their technical skills and farm equipment as *input* services to other farm operations; these activities were not inherently compatible with the onfarm diversification ventures that produce *final* goods and services tailored to consumers.

Selected Onfarm Activities: Differences in Production Innovation, Product Diversification, and Marketing

The three activities generating 95 percent of all onfarm diversification income—custom work, direct-to-consumer sales of local food, and agritourism—represent varying dimensions of onfarm business innovation and span the spectrum of agricultural activities. Custom work provides opportunities in agriculture's production process. Direct-to-consumer sales generate innovative marketing channels for agricultural products that may facilitate marketing other onfarm activities. Agritourism markets the agricultural lifestyle and farm experience to rural and urban clientele. The inherent characteristics of these three activities give rise to distinct differences in participation among farm households by farm type, farm size, and their location relative to urban centers.

A three-sector aggregation of the 19 ERS farm production types categorizes farms as:

1. Field crop farms,[8]
2. Fruit, nut, vegetable, and nursery farms; and
3. Livestock farms.

[8]Field crops include grains, oilseeds, cotton, coarse grains, and hay.

Different types of producers favored particular onfarm diversification activities in 2007. As an input link in the production process, custom work generated the largest share of noncommodity income for field crop producers, amounting to almost $1.5 billion in income, while livestock and livestock product producers earned $860 million from their custom work (table 4). Direct-to-consumer sales of local food accounted for $832 million in income for vegetable, fruit, nuts, and nursery crop farmers—almost two-thirds of all direct-to-consumer sales. Livestock and livestock product producers earned almost 60 percent of agritourism dollars in 2007.

Table 4

Characteristics of farm households engaged in selected onfarm diversification activities, 2007

Item	All onfarm diversification activities		Selected practices: Custom work	Selected practices: Agricultural tourism	Selected practices: Direct-to-consumer sales of local food
Income from onfarm diversification activities, by farm production specialty:			*Millions of dollars*		
Field crops	1,757.5		1,485.7	101.1	87.5
Vegetable, fruit, nuts and nursery crops	1,354.7		285.0	111.4	831.6
Livestock and livestock products	1,991.9		860.3	387.1	372.4
Total	5,104.1		2,631.0	599.6	1,291.5
Onfarm activities, by farm sales class:	*Percent of engaged farms*	*Percent of all farms*	*Percent of engaged farms*		
Less than $250,000	80.3	14.6	67.9	93.4	92.2
$250,000 or more	17.7	31.2	32.1	6.6	6.8
Total	100.0	16.1	100.0	100.0	100.0

Note: Data exclude nonfamily farms.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data; 2007 Census of Agriculture.

Small farm operators (sales of less than $250,000) accounted for 80 percent of farm households participating in onfarm diversification ventures, but large farm operators (sales of $250,000 or more) were twice as likely to engage in these onfarm ventures—31 percent of large farm operators versus 15 percent of small farm operators (see table 4).

Small and large farm operators responded in significant numbers to the demand for custom work, suggesting that these farmers found a niche in the agricultural production process by providing specific input services to other farm operations. According to the 2007 ARMS, small farms accounted for 80 percent of all farms demanding custom work, whereas large farms accounted for 70 percent of all custom work expenses paid out. On the supply side, small farm operators accounted for two-thirds of all farm operators performing custom work tasks, but large farm operators earned 54 percent of all custom work income. As a result, the typical large farm operator performing custom work earned three times as much noncommodity income per farm as the typical small farm operator (see table 4).[9] This income discrepancy suggests that large farm operators were able to meet scale-appropriate demand from other large farms by using more sophisticated farm equipment and specialized operator expertise not available to small farm operators.

Small farms accounted for over 90 percent of all farms reporting income from agritourism and direct-to-consumer sales of local foods; small farms accounted for 81 percent of all direct-sale farms. On the supply side, small farm operators rely on direct sales to capture a larger share of the food revenue dollar (King et al., 2010). On the demand side, small farmers have also made use of new local food sales marketing channels. In addition to roadside stands, farmers' markets, and pick-your-own operations, small

[9]With respect to income earned from custom work, small farms earned $11,600 per farm and large farms earned $34,750 per farm, on average.

farmers also supply local retailers and restaurants with seasonal output (Low and Vogel, 2011).

While these three onfarm diversification ventures elicit distinctly different participation rates, onfarm diversification activities generated only a quarter of all the noncommodity income U.S. farms earned from multi-enterprising activities. As a result, it is difficult to measure the magnitude of the direct impacts of these activities on their communities.

The Uniqueness of Portfolio Entrepreneurs and Their Importance to the Rural Economy

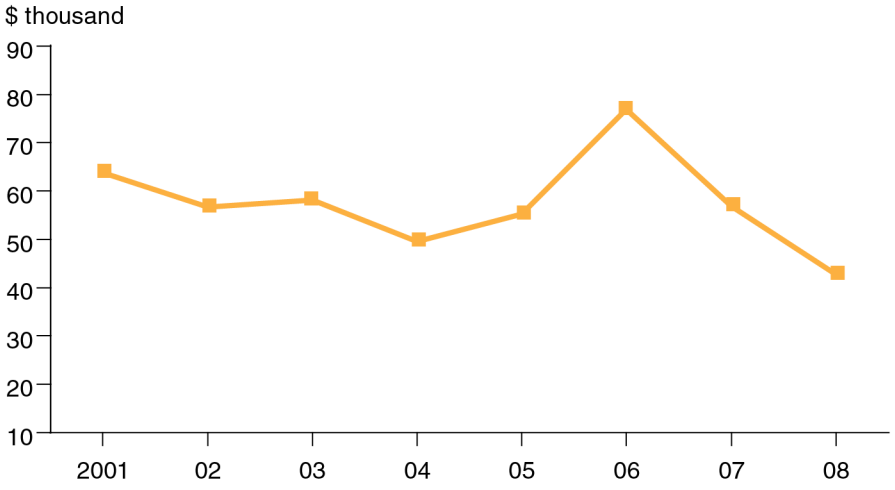
Off-farm businesses represent the single largest source of noncommodity-based business income for multi-enterprise farm households, while generating strong direct links to the nonfarm economy. Because farm operations are tied to a specific geographic location, off-farm businesses operated by farm households can provide stability to the local economy's stock of entrepreneurial capital, particularly within remote rural communities. Off-farm business activities of farm households, however, are not immune to fluctuating conditions in the macroeconomy. Average off-farm business income earned by farm households was $63,800 in 2001, peaked at $76,800 in 2006, and fell to $42,700 in 2008 (fig. 4).[10] This trend appears to have followed the macroeconomic expansionary effects of the economic boom of 2004, followed by its bust in 2008.

Portfolio entrepreneur farm households who own and operate nonfarm businesses exhibit characteristics that separate them from other farm households. In 2007, they earned 75 percent more household income, on average, than farm households that did not operate an off-farm business (fig. 5). In addition to their off-farm business earnings, averaging $54,700, these farm households also earned higher levels of labor income and unearned income from their household wealth portfolio and from public and private transfer payments, on average. In contrast, portfolio entrepreneur farm households earned a third less in farm income, on average, than did farm households not operating off-farm businesses.

This income profile suggests that portfolio entrepreneur farm households are entrepreneurs first and farmers second based on their ability to generate pecuniary returns from allocating resources between their farm and nonfarm

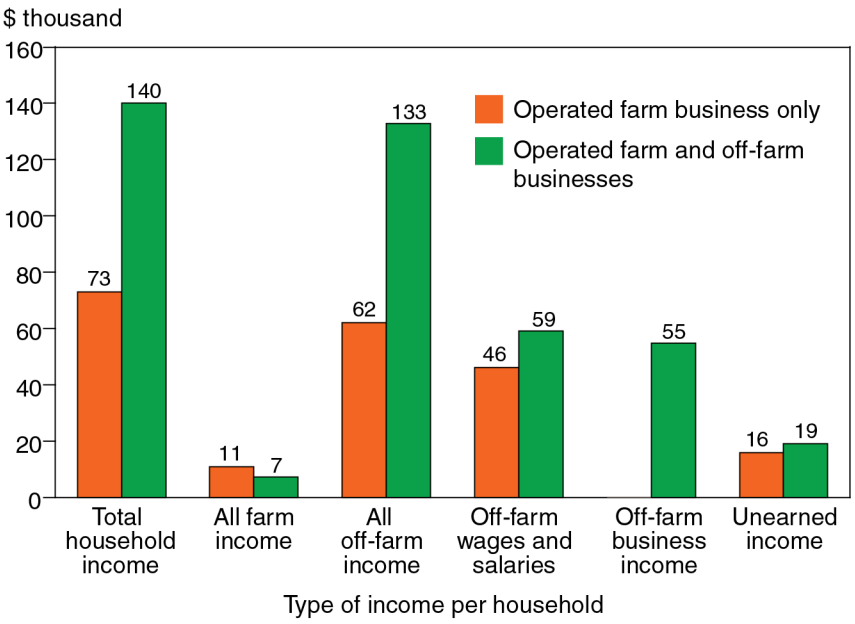
[10]These figures are in nominal dollars but track very closely with real dollars given this period's low rate of inflation.

Figure 4
Average off-farm business income of multi-enterprising farm households, 2001-08



Note: Nonfamily farms are excluded.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2001-08 Agricultural Resource Management Survey (ARMS) data.

Figure 5
Average farm household income, by operating status, 2007



Note: Nonfamily farms are excluded.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

enterprises as well as from optimally allocating resources within each enterprise. That these farm households earn less in farm income suggests that maximizing the combined income from both enterprises is a key household decision.

ARMS data allow us to distinguish between two types of farm portfolio entrepreneurs based on whether they employ part-time or full-time workers. Off-farm businesses with no employees are classified as sole proprietorships. These sole proprietorships include mom-and-pop businesses that merely supplement farm household income and start-up enterprises with business plans to hire nonfarm workers in the future. Markley and Low (2012) refer to sole proprietorships as "necessity entrepreneurs" who may face few opportunities or possess limited financial or physical resources for enterprise growth. In 2007, 62 percent of portfolio entrepreneurs were identified as sole proprietors earning an average $22,600 in off-farm business income per farm household.

Off-farm businesses with employees are classified as employer establishments.[11] Markley and Low (2012) consider employer establishments as examples of growth entrepreneurs responding to business opportunities in their local economies. Farmer-operated nonfarm employer establishments accounted for 38 percent of all off-farm businesses and generated an average $108,900 in business income per farm household. These establishments employed 853,000 workers, suggesting that many farmers have developed diversified enterprises and have effectively kept additional value-added income and employment within their local community. Employer establishments earn five times the off-farm business income per farm household as that earned by sole proprietorships, supporting Markley

[11]Farm households that reported earning off-farm business income, but failed to report hiring any employees (a nonresponse), were counted as if they had reported zero employees. Potential bias in our estimates may exist if farm households operating employer establishments failed to report employing off-farm labor which would wrongly classify these nonresponses as sole proprietors. Two diagnostic checks suggest that this nonresponse bias was not a serious issue. First, except in two cases, the differences in the mean estimates of proprietors' income and employer establishment income were statistically significant at the 10-percent level or, in many cases, even higher regardless of whether the sample was disaggregated by farm household type or by industrial sector. Thus, any bias present was not sufficiently large to affect statistical significance of estimated differences in sample means. Second, there were no establishments with employees that failed to report the industrial sector to which they belonged (see table 7), so this was not a source of nonresponse bias.

and Low's (2012) contention that the more dynamic notions of entrepreneurship—innovation, risk taking, and creative marshaling of resources—may be found in employer establishments.

Differences in the average off-farm business incomes earned by different types of farm households suggest that their farm business characteristics may influence their off-farm business decisions. While off-farm businesses operated by rural residence and commercial farm households generated twice the household income of those operated by intermediate farm households, on average, distinguishing between sole proprietorships and business enterprises suggests a more complex pattern (table 5). Among sole proprietorships, commercial farmers generated almost twice the average off-farm business income of other farmers operating nonfarm proprietorships, whereas off-farm employer establishments operated by rural residence farmers generated almost twice the average business income of other farmer-operated nonfarm employer establishments.

This contrast may suggest that off-farm sole proprietorships and employer establishments operated by commercial farmers may have strong ties to their farm operations; that is, the off-farm operations were spun off from their farm operations as market demand increased. Conversely, off-farm employer establishments operated by rural residence farm households may have weaker links to the farming sector and stronger links to the local nonfarm economy. Employer establishments operated by rural residence farms employed over 70 percent of all local nonfarm workers in 2007, suggesting that these enterprises are more integrated into the community's nonfarm economy.

The Industrial Structure of Off-Farm Businesses

Off-farm businesses generate unique economywide impacts in their local communities depending on the industry. Off-farm businesses were grouped

Table 5
Characteristics of off-farm businesses operated by farm households, 2007

Item	Type of farm operated			
	Rural residence farms	Intermediate farms	Commercial farms	All family farms
Total number of off-farm businesses	274,688	92,793	28,102	395,583
Percent of all farm households	19.3	17.7	13.7	18.4
Sole proprietorships (percent of off-farm businesses)	59.1	74.9	59.9	62.8
Employer establishments (percent of off-farm businesses)	40.9	25.1	40.1	37.2
Average off-farm business income ($)	64,610	25,146	54,728	54,651
Average sole proprietor business income ($)	24,433	13,305	42,793	22,568
Average employer establishment income ($)	122,581	60,401	72,583	108,886
Total number of jobs (1,000s)	613.0	162.1	78.0	853.1
Percent of total	71.9	19.0	9.1	100.0

Notes: Data exclude nonfamily farms. Off-farm businesses not employing part-time or full-time workers are classified as sole proprietorships, while off-farm businesses with employees are classified as employer establishments.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

into four broad industrial categories plus a category for farmers not reporting the industrial classification of their businesses:

- Agricultural services and natural resource extractive industries;
- Construction;[12]
- Wholesale trade, transportation, and utilities; and
- Services.

Farm households operating off-farm businesses made important contributions to their local economies by generating an estimated $111.6 billion in sales of goods and services and $24.5 billion in hired labor income in 2007 (table 6).[13] Sole proprietors accounted for a third of the off-farm businesses that identified their industrial classification and for all of the unidentified businesses. Among the businesses identified by industry, off-farm business enterprises (those with employees) earned more than twice the total business income as was earned by sole proprietorships, on average.

Defined as the sum of labor and capital income plus indirect business taxes, value-added income is a summary measure of a community's gross regional product. In addition to the value-added income generated by the farm operation, farmers who operated off-farm businesses also contributed an additional estimated $54.6 billion in 2007 to their local community's gross regional product. Without this contribution, the goods and services supplied by farmer-owned off-farm businesses may have been imported from outside the local economy or may not have been available at all. Farmer-owned employer establishments accounted for 87 percent of all value-added income created by farmer-owned off-farm businesses, providing additional evidence of how important employing local area workers is to the community's well-being.

Overall, the industrial composition of off-farm businesses—half of which belong to the service sector—appears to correspond roughly to the industrial composition of the rural economy as a whole (see table 6). Retail trade and FIRE (finance, insurance, real estate) off-farm businesses accounted for 60 percent of service sector enterprises, suggesting that these businesses offer a diverse set of entrepreneurial opportunities to farm household members, whether transitioning into or out of farming or remaining established portfolio entrepreneurs.[14] In 2007, farm households operating off-farm service-sector businesses had the largest footprint in their local communities, generating $49.2 billion in sales and paying $14.1 billion in labor income to 408,600 part-time and full-time workers. Operating with less physical capital and overhead relative to their human capital inputs, service-sector enterprises generated roughly 60 percent of all off-farm business profit income accruing to farm households and almost 60 percent of all off-farm labor income paid to their employees.

In rural areas, construction enterprises occupy a niche in which geographic distances preclude relatively larger construction firms located in urban areas from cost-effectively competing for projects that improve a community's stock of farm and nonfarm buildings, residential housing, and road infrastructure. Construction represents the second largest group of off-farm businesses, suggesting that many farm operators used their mechanical and structural

[12]The construction sector also includes off-farm manufacturing businesses, a sample size too small to justify a separate category. Manufacturing enterprises accounted for less than 15 percent of the off-farm businesses in this sector.

[13]The appendix explains the methodology used to estimate the volume of sales of goods and services, value-added income, and labor income generated by off-farm businesses.

[14]Rural residence, intermediate, and commercial farm families operated service-sector enterprises in the same proportions.

Table 6

Characteristics of off-farm businesses, their economic footprint, and firm performance, by type of off-farm business, 2007

Item	Sector						
	Agricultural services and natural resource industries	Construc-tion[1]	Wholesale trade, transporta-tion, and utilities	Services	Total reported types of business	Unreported	All
Number of off-farm businesses	23,352	57,058	23,138	113,148	216,696	178,887	395,583
Percent	10.8	26.3	10.7	53.2	100.0	–	
Sole proprietorships (percent of off-farm businesses)	31.6	25.8	35.2	36.1	32.2	100.0	62.8
Employer establishments (percent of off-farm businesses)	68.4	74.2	64.8	63.9	67.8	–	37.2
Aggregate economic footprint:			*Millions of dollars*				
Off-farm business income	1,718	3,937	1,580	11,570	18,805	2,814	21,619
Total sales of off-farm business output	6,731	32,052	9,618	49,195	97,597	14,018	111,615
Value-added income	2,766	11,728	5,720	31,092	51,305	3,344	54,649
Labor income	762	6,226	2,808	14,136	24,468	–	24,468
Employment (thousands of jobs)	106.9	182.5	150.9	408.9	853.1	–	853.1
Sector performance:			*Percent*				
Off-farm business income	9.1	20.9	8.4	61.5	100.0		
Total sales of off-farm business output	6.9	32.8	9.9	50.4	100.0		
Value-added income	5.4	22.9	11.1	60.6	100.0		
Labor income	3.1	25.4	11.5	57.8	100.0		
Employment	12.6	21.6	17.8	47.5	100.0		
Business performance:							
Average business income ($)	73,585	68,992	68,275	102,254	86,778	15,733	54,651
Average sole proprietor income ($)	---------- 36,2902--------			55,151	47,128	12,732	22,568
Average employer establishment income ($)	91,567	76,771	94,956	128,857	108,886	–	108,886
Average number of employees per firm	6.7	4.3	10.1	5.6	5.8	–	5.8
Value-added/worker ($1,000)	22.3	55.6	30.0	61.4	50.1	–	50.1

[1]The construction sector also includes a small number of manufacturing enterprises. Off-farm manufacturing establishments accounted for 14 percent of construction and manufacturing enterprises, 11 percent of this sector's business income, and 7 percent of this sector's employment.
[2]There were insufficient observations to report average proprietor incomes for each of these three sectors; this figure is the group average.
Notes: Data on nonfamily farms excluded. Off-farm businesses not employing part-time or full-time workers are classified as sole proprietorships, while off-farm businesses with employees are classified as employer establishments.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

design skills in both their farm and off-farm businesses. In 2007, 26 percent of off-farm business enterprises were in construction and generated $32 billion in sales, paying out $6.2 billion in labor income to 182,500 workers (see table 6).

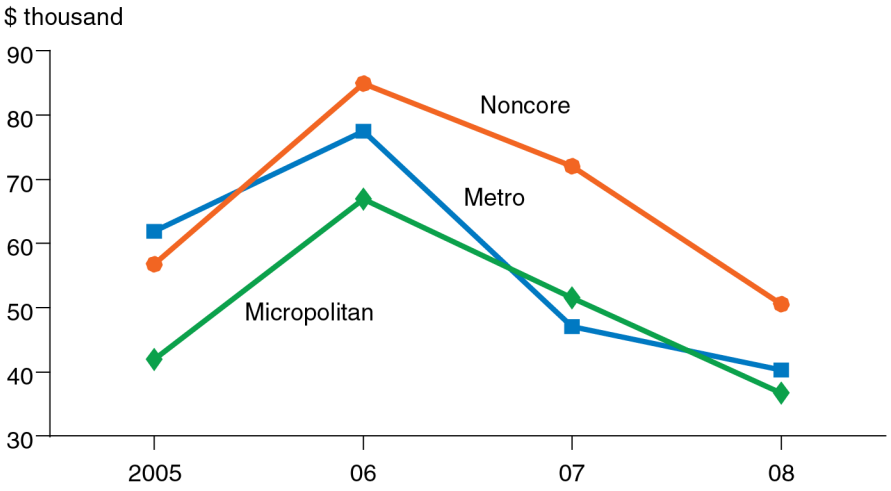
Agricultural service ventures include custom work businesses. Overall, farm operations paid $5.4 billion for crop-related custom work in 2007 but only $2.6 billion of these services were supplied by farm households' onfarm diversification ventures. Thus, the net difference suggests that the remaining $3.7 billion in crop-related custom work purchased was supplied by nonfarm businesses regardless of whether they were operated by farm households. Farmer-operated off-farm businesses in agricultural services and other natural resource industries sectors earned $1.7 billion in income on $6.7 billion in sales (see table 6). Since the industrial classification system used in ARMS is too aggregated, however, the data could not be used to identify the extent to which custom work was supplied by farmer-operated off-farm businesses.

Value-added income per worker measures the average contribution to the well-being of the local economy made by an employee of an off-farm business. Service sector and construction enterprises generated the most value-added income per worker, or $62,400 per worker and $55,600 per worker, respectively, followed by value-added contributions made by off-farm enterprises in the wholesale trade, transportation, and utilities sector and agricultural services and natural resource industries sector (see table 6). The service sector and construction businesses play an important role in local community employment. The average number of employees per firm for farmer-owned off-farm businesses in construction and services was less than or equal to the average for all off-farm business enterprises. In contrast, the agricultural services, natural resource industries sector, and the wholesale trade, transportation, and utilities sector employed more workers per firm, on average, but generated 40-50 percent less than the average value-added income per worker for all off-farm business enterprises. The number of jobs linked to the type of off-farm employer establishment was not directly correlated with its contribution to the local economy, thus reinforcing the interest among economic development practitioners in the "quality" of jobs.

Off-Farm Businesses as Crucial Linkages in the Rural Economy

Within the urban/rural continuum, off-farm businesses of farm households located in rural areas earned, on average, higher incomes and appeared to be more important sources of local employment than off-farm businesses of farm households in urbanized areas in 2007. Off-farm enterprises were grouped by their location in three types of counties: metropolitan (metro) counties, nonmetropolitan-micropolitan (micropolitan) counties with urban populations of 10,000 up to 50,000, and nonmetropolitan-noncore (noncore) counties with urban centers less than 10,000 residents. Since 2006, average off-farm business income per farm household located in noncore counties has been about 30 percent higher than average off-farm incomes earned by farm households in metro and micropolitan counties (fig. 6). Additional research will be necessary to understand if and how the economic and spatial isolation of noncore counties with respect to urban centers can explain this difference in off-farm

Figure 6
Average off-farm business income per portfolio-entrepreneur farm households, by type of county, 2005-08



Notes: Nonfamily farms are excluded. Metropolitan (metro) counties are counties with urban populations of 50,000 or more residents. Micropolitan counties are nonmetropolitan counties with urban populations of 10,000-50,000 residents. Noncore counties are nonmetropolitan counties with urban populations of less than 10,000 residents.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2005-08 Agricultural Resource Management Survey (ARMS) data.

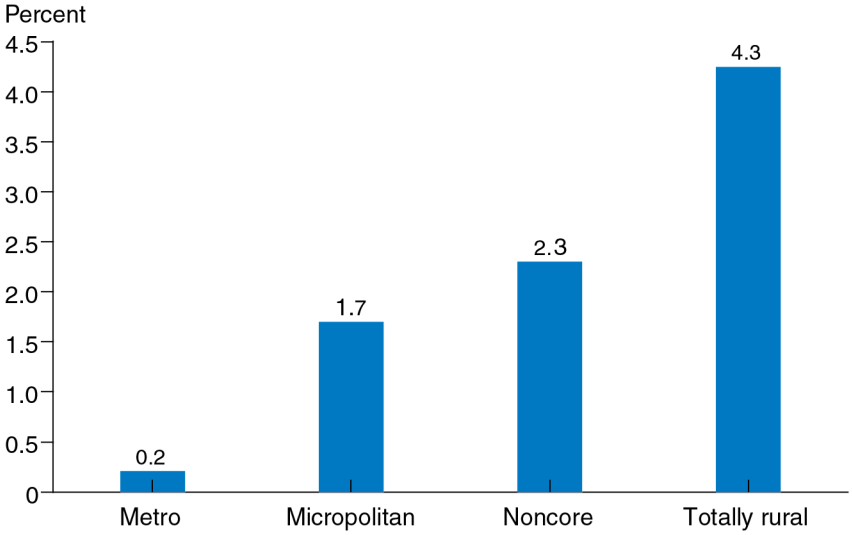
business earnings. For example, to what extent has this isolation dampened the impacts of recent macroeconomic contractions felt in noncore counties versus having sheltered farm household-operated off-farm businesses in noncore counties from stronger competitors in denser urban economies?

As a nonmetropolitan county is situated farther away from the urban core, the share of its employed labor force linked to farm-household-operated nonfarm businesses increases. In 2007, jobs directly linked to off-farm businesses operated by farm households accounted for 0.2 percent of the employed labor force in metro counties. Farm-household-operated off-farm businesses accounted of 1.6 percent of employment in micropolitan counties and almost 2.4 percent of employment in noncore counties (fig. 7). For a subset of noncore counties with centers of urban population of less than 2,500 residents (defined here as "totally rural counties") off-farm businesses operated by farm households employed 4.2 percent of the local employment base (see box, "Indirect Impacts Linked to Off-Farm Businesses Are Not Included").

Data from the 2007 ARMS allowed us to explore the importance of local context in a farm household's decision to operate an off-farm business (fig. 8). The share of farm households engaged in an off-farm business follows a slight U-shaped curve as county population density decreases from 300 inhabitants per square mile in metro counties to 5-9 inhabitants per square mile in rural counties. The relatively high shares of farm households operating off-farm businesses in metro and very urbanized nonmetro counties suggests that farm households are presented with a plethora of entrepreneurial opportunities in urbanized economies—opportunities that offset urban resource constraints precluding the expansion of the farm operation. Twenty-one percent of farm households in metro counties operated an off-farm business. In nonmetro counties, entrepreneurial farm households face

Figure 7

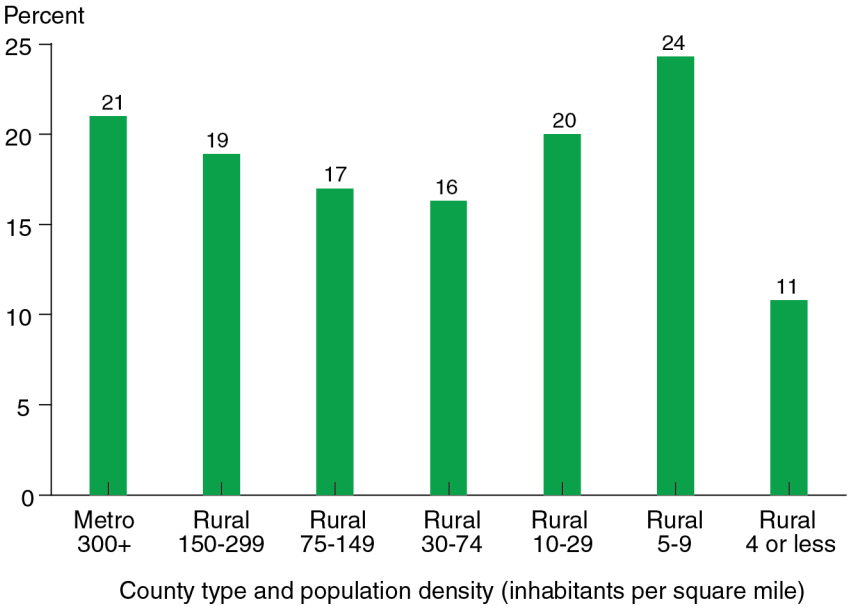
Share of county labor force employed directly by farm-household-operated off-farm businesses, by type of county, 2007



Notes: Nonfamily farms are excluded. Metropolitan (metro) counties are counties with urban populations of 50,000 or more residents. Micropolitan counties are nonmetropolitan counties with urban populations of 10,000-50,000 residents. Noncore counties are nonmetropolitan counties with urban populations of less than 10,000 residents. Totally rural counties are defined as a subset of noncore counties with centers of population of less than 2,500 residents.
Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data.

Figure 8

Share of farm households operating off-farm businesses, by county population density, 2007



Sources: USDA's Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey (ARMS) data; U.S. Department of Commerce, *Census Bureau, 2010 Census Redistricting Data (Public Law 94-171) Summary File*, 2011, and *Intercensal Estimates of the Resident Population for Counties, 2000-2010*, 2011.

Indirect Impacts Linked to Off-Farm Businesses Are Not Included

Jobs indirectly tied to off-farm enterprises result from second-round effects of local off-farm businesses input purchases as measured by Type I multipliers and consumption expenditures made by the employees of these off-farm businesses that are incorporated into Type II or social accounting matrix (SAM) multipliers. These multipliers are derived from the U.S. input-output model. Using these multipliers suggests that the indirect employment impacts could range nationally from 256,000 additional jobs up to 2.3 million additional jobs.

There are two central ideas that strike at the validity of reporting these indirect employment estimates. First, at the conceptual level, these estimates would only be valid under the assumption that farmer-operated off-farm businesses did not exist when their local economies were operating in equilibrium and after which their sudden appearance would cause their local economies to adjust to a new equilibrium. Since ARMS data were collected on off-farm enterprises already part of the industrial fabric of their local communities, this assumption is not valid (see the appendix for further elaboration of this point).

Second, at the empirical level, these national-level estimates are not robust because industrial and demographic structures and current labor market conditions vary too widely from county to county to assess whether these indirect employment links are strong or weak. Manufacturing enterprises generate low direct employment effects, but their intensive use of high-valued inputs generates the highest indirect job multipliers. Service sector enterprises use the smallest volume of purchased inputs and generate the smallest indirect employment multipliers. Metro counties have dense industrial structures that contribute to high indirect job multipliers, while sparsely populated rural counties must import a much larger share of their industrial and consumer goods, which contributes to smaller indirect job impacts.

Indirect employment linked to off-farm businesses also depends on the county's current economic climate. A robust economy with a churning labor market may experience little indirect employment effects linked to off-farm businesses as nonfarm job opportunities remain plentiful. In a stagnant rural county, off-farm businesses may generate downstream effects indirectly leading to additional local jobs.

The magnitude of local employment linkages, as measured by job multipliers, evolves in the long run as the diffusion of new technologies alters the composition of local industries and their links to the broader economy. For example, a new business service provided by an off-farm enterprise in a rural county may not have existed previously because information technologies were underdeveloped. Conversely, as technologies mature, the same local service may later be outsourced globally or bundled with similar goods and services, effectively redefining the nature of the off-farm business. It is unclear how job multipliers may change, but the economic development process suggests that off-farm business, whether farmer-owned or not, will demand workers with greater technical skills over time.

fewer business opportunities; hence, the share of farm households operating an off-farm business declined to 16 percent in counties with a population density of 30-75 inhabitants per square mile.

Although rural counties with even lower population densities and smaller urban centers generate fewer business opportunities in increasingly thinner markets, the corresponding local stock of entrepreneurial capital may be even lower once the population goes below a certain density such that more farm households can compete for these business opportunities. Hence, the share of farm households operating off-farm businesses rose to 20 percent in rural counties with population densities of 10-29 inhabitants per square mile to 24 percent in rural counties with population densities of 5-9 inhabitants per square mile (see fig. 8). Once a county's population density falls below the sustainable threshold of 5-9 inhabitants per square mile, markets become too thin and alternative entrepreneurial opportunities become too scarce for many

farm households developing off-farm businesses while still farming. In most remote counties (population densities of 4 inhabitants per square mile), only 11 percent of farm households were able to operate an off-farm business.

The same U-shaped trend showing farmers engaged in off-farm businesses over a sustainable population density threshold was also observed in 2006, 2008, and 2009 ARMS data. Future research will test whether this pattern qualifies as a stylized fact characterizing the availability of off-farm business opportunities for farm households residing in urban and rural counties where population densities vary.

Farm households can and do play important roles in maintaining the sustainability of remote noncore communities (see figs. 7 and 8). Most of these farm households operate small farms, with the operator reporting a nonfarm primary occupation. Although their contribution to the value of farm production remains small, portfolio-entrepreneur farm households play a significant role in the rural economy's stock of social capital and employment base. Bartlett (1986) observed that small farmers who work off farm were farming the "rural lifestyle." This observation can be extended to the entrepreneurial farm households responsible, in part, for sustaining it.

Conclusions

Many U.S. farm households earn income from entrepreneurial activities not directly tied to the production of farm commodities, typically through off-farm business ventures. In 2007, these ventures generated $26.7 billion in additional farm household income. Niches in agriculture's production process, product diversification, marketing, and associated farm and rural amenities have created a variety of onfarm opportunities for farm resources to be used in new and innovative ways. These activities generated $5.1 billion in additional farm household income in 2007, while contributing to the rural lifestyle.

In 2007, off-farm business profits provided the largest single source of noncommodity enterprise income for farm households ($21.6 billion in profits from $111.6 billion in sales) and $54.6 billion in value-added income to the gross regional products of local economies, including paying out $24.5 billion in wages and salaries to 853,100 part-time and full-time employees. Entrepreneurial acumen appears to be quite portable across farm and nonfarm enterprises, providing an alternative occupational pathway into and out of agriculture. Off-farm businesses employ a significantly larger share of the employed labor force in micropolitan and noncore counties than in metropolitan counties, such that almost 5 percent of nonfarm jobs in the most remote rural areas were linked to off-farm businesses operated by farm households. For counties with population densities too low to sustain local nonfarm activity, however, off-farm business opportunities for farm households diminished substantially.

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Appendix: Estimating Sales, Value-Added Income, and Labor Income Generated by Off-Farm Businesses

To produce the estimates of output, value-added income, and labor income generated by off-farm businesses operated by farm households, the fixed relationships between profit income and output embedded in a social accounting matrix (SAM) multiplier model were used. In the SAM framework, an exogenous shock to a particular group of industrial sectors or households (Δx) multiplied by a matrix of SAM multipliers ($\mathbf{M}$) produced economywide effects on sectoral outputs, factor incomes, and household incomes (Δy),

(1) $\Delta \mathbf{y} = \mathbf{M} \cdot \Delta \mathbf{x}$.

The Hadamard product of the vector of direct value-added income coefficients ($\boldsymbol{\nu}$) and the vector of sector outputs$\cdot(\mathbf{M_A} \cdot \Delta \mathbf{x})$ converted the new output flows into value-added incomes by sector ($\Delta \mathbf{y}_{\boldsymbol{\nu}}$) that were required to support these changes in firm output,[1]

(2) $\Delta \mathbf{y}_{\boldsymbol{\nu}} = \boldsymbol{\nu} \cdot (\mathbf{M_A} \cdot \Delta \mathbf{x})$.

The Hadamard product of the vector of direct labor-income coefficients ($\boldsymbol{\ell}$) and the vector of sector outputs$\cdot(\mathbf{M_A} \cdot \Delta \mathbf{x})$ converted the new output flows into labor incomes by sector ($\Delta \mathbf{y}_{\boldsymbol{\ell}}$) that were required to support these changes in firm output,

(3) $\Delta \mathbf{y}_{\boldsymbol{\ell}} = \boldsymbol{\ell} \cdot (\mathbf{M_A} \cdot \Delta \mathbf{x})$.

The Hadamard product of the vector of direct labor-output coefficients ($\mathbf{L}$) and the vector of sector outputs$\cdot(\mathbf{MA} \cdot \Delta \mathbf{x})$ converted the new output flows into employment demanded by sector ($\Delta \mathbf{j}$) that were required to support these changes in firm output,

(4) $\Delta \mathbf{j} = \mathbf{L} \cdot (\mathbf{M_A} \cdot \Delta \mathbf{x})$.

Equations 1-4 assume that the national or regional economy is in an accounting equilibrium which when perturbed by an exogenous event yields a new equilibrium outcome.

Farm households operating off-farm businesses and generating profit income are assumed to operate in the original equilibrium. That is, they are not starting a new business. Therefore, no "new" derived demands for intermediate goods and labor services are generated. The backward linkage effects captured by the global SAM multiplier matrix $\mathbf{M_A}$ cannot be counted. Instead, assuming farmers are operating off-farm businesses in equilibrium requires modification of the model such that we exclude indirect and induced effects that would be generated by using Type I, Type II, and/or SAM multipliers.

Given the 2007 ARMS data on off-farm business income, we worked backward to obtain estimates of equilibrium sales, value-added income, labor income, and employment generated by these enterprises. Off-farm business enterprise income earned by farm households was recorded as gross

[1]The multiplier matrix $\mathbf{M_A}$ is the submatrix of $\mathbf{M}$ that contains only the interindustry multipliers. The Hadamard product of two matrices of the same dimension is the matrix of the elementwise products: if $\mathbf{A} = (a_{ij})$ and $\mathbf{B} = (b_{ij})$, then $\mathbf{AB} = (a_{ij}b_{ij})$.

operating surplus in the national income and product accounts. Dividing the sectoral levels of off-farm business income ($\Delta\varpi_i$'s) by these direct profit-income coefficients ($b\varpi_i$'s) yielded the volume of sales or output by sector produced by these off-farm enterprises,

$$(5) \qquad \Delta x_i = \Delta\pi_i / b\pi_i \,,$$

where Δx_i represents the level of sales for each of the four sectors in table 7 (i = 1, 2, 3, 4). We now have recovered the level of apparent exogenous sales that would produce the average annual level of real off-farm business income reported by farm households in table 3. Given this information, the vector of the sector estimates of value-added income generated by the off-farm businesses is,

$$(6) \qquad \Delta \mathbf{y}_{\boldsymbol{u}} = \boldsymbol{u} \cdot \Delta \mathbf{x} \,.^{2}$$

Similarly, the vector of the sector estimates of labor income is,

$$(7) \qquad \Delta \mathbf{y}_{\boldsymbol{\ell}} = \boldsymbol{\ell} \cdot \Delta \mathbf{x}_{\mathbf{EE}} \,.$$

Labor income estimated in equation 7 is calculated using only sales generated by farmer-run employer establishments $\Delta \mathbf{x}_{\mathbf{EE}}$. Similarly, the number of jobs linked to off-farm business by sector are estimated by,

$$(8) \qquad \Delta \mathbf{j} = \mathbf{L} \cdot \Delta \mathbf{x}_{\mathbf{EE}} \,,$$

where $\mathbf{L}$ is the vector of labor output ratios.

Equations 5-8 form the basic equations for the special case of the SAM multiplier model that quantifies only the economywide direct impacts of off-farm businesses operating in current equilibrium. Using direct coefficients instead of multiplier values avoids including spillovers that can only occur when a new event perturbs the original equilibrium. This kind of analysis is a form of "contribution analysis" because it measures the contribution of a particular industrial activity to local or regional economy in equilibrium.

To test the soundness of this approach, we initially used the direct job/output ratios from a four-sector U.S. model generated by the 2002 IMPLAN (Impact analysis for PLANning) software and database to compare the number of jobs estimated in equation 8 with the number of jobs linked to off-farm businesses reported in ARMS for 2006-07 (see table 3). The employment estimates in equation 8 hold up well when compared with the ARMS estimates. When we used the 2008 IMPLAN database that accounts for increases in labor productivity embedded in the 2002 benchmark U.S. input-output tables, we found that this latter 2007 SAM estimate of the number of jobs directly linked to off-farm businesses underestimates the 2007 ARMS estimate by almost 160,000 jobs. While there is a need for further research, three possibilities may explain this difference. First, the sectoral labor productivities of the farmer-operated off-farm businesses may be less than the industry average for the economy as a whole. Second, unlike the SAM estimates, the ARMS estimates are reported responses based on labor market conditions that may include disguised underemployment. Third, year-to-year changes in the ARMS sampling weights also may introduce variation in these estimates.

[2]For unidentified off-farm businesses, their value-added income was computed by multiplying their total sales by a modified value-added coefficient, the latter of which is computed by subtracting the average labor-income coefficient from the average value-added coefficient for the U.S. economy as a whole.

Nevertheless, the overall comparison of the ARMS estimates with the SAM simulation estimates suggests that this approach will produce reasonably robust results.

The direct coefficients of profit, value-added, and labor incomes were calculated using the 2002 U.S. benchmark input-output tables published by the Department of Commerce, Bureau of Economic Analysis.

Appendix table

Total number of jobs linked to off-farm businesses, 2005-07

Year	Off-farm business income[1] ($ millions)	Estimated jobs (1,000s)	
		Modified SAM estimate (equation 8)	ARMS data
Using 2002 IMPLAN job/output ratios:			
2005	18,447	875.6	-[2]
2006	17,741	850.4	1,021.2
2007	18,805	899.6	853.1
Using 2008 IMPLAN job/output ratios:			
2007	18,805	690.2	853.1

[1]Proprietors' income is excluded.
[2]ARMS data on the number of workers employed by off-farm businesses was first collected in 2006.
SAM=Social accounting matrix.

Source: USDA's Economic Research Service and National Agricultural Statistics Service, 2005-07 Agricultural Resource Management Survey (ARMS) data.