

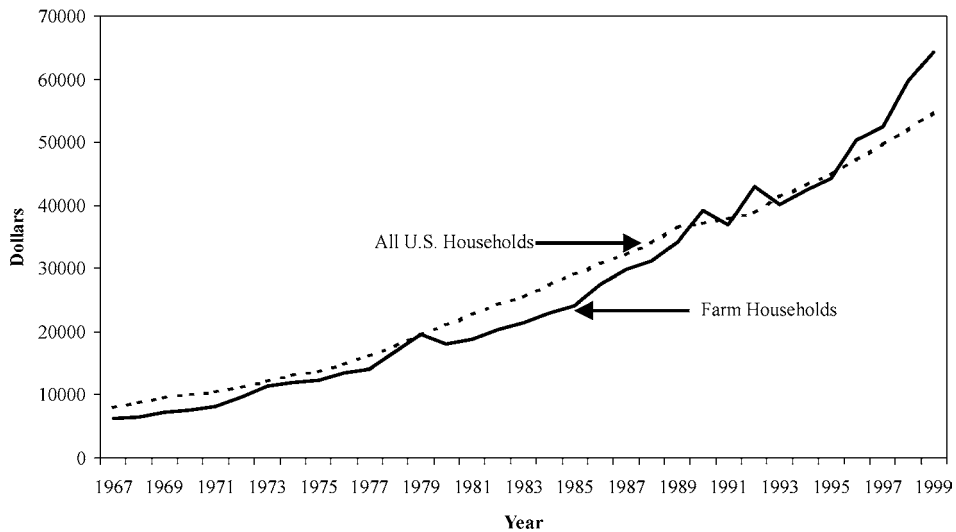
Stability of Farm Income and the Role of Nonfarm Income in U.S. Agriculture

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This study measures the variability in real net farm income in the U.S. agricultural sector and per farm and determines if variability has diminished over 1933 to 1999. Second, the role of nonfarm income in reducing the variability in total farm household income is examined. Results indicate that the variability in real net farm income in the sector and at the farm level has not diminished and that nonfarm income has helped to reduce the variability in total farm household income.

Farm households¹ historically were financially disadvantaged compared to other households in the United States. Low farm output prices and incomes, wide year-to-year price fluctuations, and demands for government assistance greatly influenced the development of farm price and income support programs² in the 1930s. In general, these farm policies were designed to bring average farm household income (assumed to be at the poverty level) up to that of all nonfarm households in America (Hallberg). However, in studying the economic well-being of farm households, Ahearn, Perry, and El-Osta concluded that farm households were no longer a disadvantaged group in income terms and that their net worth was significantly larger than that of the general population.³ Their study noted that farm operator households experienced a higher proportion of very low or poverty-level incomes when only income from farm sources was considered. Comparison of the average money income of farm operator households with that of all U.S. households (figure 1) reveals much about the relative well-being of farm families. Farm households' average money income has been comparable⁴ to that of all U.S. households since 1990 and has exceeded that of all U.S. households since 1996 (figure 1; U.S. Department of Agriculture, 2001; U.S. Department of Commerce, *Census of Population*, various).

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Figure 1. Mean income of farm and all U.S. households, 1967–1999

A similar trend can be seen in Europe. Hill and Cook concluded that average disposable income per farm household in the European Union (EU) is typically higher than the all-household average. Cahill, Fulponi, and Moreddu presented data for 16 Organization for Economic Cooperation and Development (OECD) countries and concluded that there is little support for claims there is a farm household income problem in OECD member countries. Where low incomes do exist, they are associated with structural features of the household and the local rural economy.

However, U.S. farmers over the past six decades have continually experienced variability in farm income (Cochrane, 1953; Firch; Hathaway; Schultz; Tweeten, 1979, 1983). Fluctuations in farm output, commodity prices, and business cycles are major causes of farm income variability (Firch; Schultz; Cochrane, 1953; Tweeten, 1979). Price changes have not followed a consistent pattern. Furthermore, export demand tends to be more unstable than domestic demand (Johnson, 1977). As a principal residual supplier of grain, cotton, and soybeans on the world market, American agriculture has become more vulnerable to decisions made in other countries (usually large importers). U.S. farm prices can be influenced as much by policy decisions made in Russia, China, and the EU as by those made internally. In some cases, the U.S. government has become a principal contributor to income variability through policy actions, such as agricultural trade embargoes in the 1970s and 1980s, alterations in set-aside requirements, and the introduction of the Payment-in-Kind (PIK) program in 1983. Furthermore, macroeconomic policies, as they affect interest rates and exchange rates, are also considered sources of income instability in agriculture (Schultz; Schuh; Johnson, 1977).

Income stability has long been one of the goals of American agricultural policy (Halcrow; Johnson, 1947; Nourse, Davis, and Black), but it is a concept that has not been clearly defined. In practice, stability has been mainly sought through the

use of various price support and/or supply control programs (Cochrane, 1979; Benedict; Hallberg) in an attempt to secure higher prices than would likely occur under free-market conditions. No particular level of net income has been guaranteed and no limits specified beyond which net incomes would not be allowed to vary. This leads to the primary objective of this paper: to examine the degree of farm income instability. Specifically, has the variation diminished over time on an aggregate and per-farm basis? The assumption is that farmers are ultimately concerned more about their net incomes than about prices and costs. A secondary objective is to investigate the role of off-farm income in reducing the income variability of farm households in the United States.

Stability of Farm Income

Some perspective on the U.S. agricultural industry from 1933 to 1999 may be derived from table 1. Note that aggregate real net farm income (ARNFI)⁵ on agricultural holdings in the United States increased from \$25,093 million in 1933 to \$36,996 million in 1999 (measured in 1992 dollars).

U.S. agriculture experienced good times throughout most of the late 1940s (1943–1948) when ARNFI reached its highest level (\$98,156 million) in 1946, immediately after World War II. In 1973, aggregate real net farm income (\$97,326 million) climbed close to the record high levels of 1946 (\$98,156 million) and 1948 (\$97,693 million).⁶ However, there was substantial volatility in aggregate real net farm income throughout 1933 to 1999. Thirty-two of the year-to-year movements in ARNFI were downwards, 29 upwards, and 4 year-to-year (1940, 1962, 1971, and 1979) changes were almost zero. The rate of change, as measured by the percentage variation from year to year in real net farm income was also variable. For example, the rate of increase was extremely rapid during 1934–1935, 1972–1973, and 1983–1984. On the other hand, marked decreases in ARNFI were observed in the 1948–1949, 1973–1974, 1979–1980, and 1982–1983 periods. The calculated trend of aggregate real net farm income⁷ indicates that predicted aggregate real net farm income (PARNFI) declined on average by \$377 million per year (figure 2).

A similar picture emerges when real net farm income is considered on a per-farm basis. Real net farm income per farm (RNFIPF) was highest in 1973 (\$34,473 per farm), largely due to record high prices (almost twice 1972 prices) for wheat (\$3.95 per bushel), corn (\$2.55 per bushel), cotton (69.39 cents per pound), and cattle (\$45.61 per hundredweight; U.S. Department of Agriculture, *Agricultural Statistics*, various). The 1973 boom in farm prices was triggered by huge exports to the former Soviet Union and South and Southeast Asia. Following the record levels of 1973, real net farm income per farm declined to \$8,187 per farm in 1983—the lowest level since World War II. A possible explanation for this is the combined effect of the drought of 1982–1983, the PIK program, and other set-aside programs initiated by the government. Marked increases in real net farm income per farm occurred in 1935, 1937, 1941–1942, 1973, 1981, 1984, and 1996.

Figure 2 presents actual and predicted real net farm income in the United States during the period 1933–1999. The figure shows a downward trend in both actual and predicted real net farm income, but an increase in nominal net farm income. Also, despite the downward trend in total real net farm income, real income

Table 1. Aggregate and per-farm real net farm income^a of farming sector in the U.S., 1933–1999

Year	Net Farm Income ^b (NFI) (\$Million)	Net Farm Income (ARNFI) (1992 = 100) (\$Million)	Yearly Variation (ARNFI) (\$Million)	Yearly Variation (%)	Variation of Actual RNFI from (PARNFI) ^{cd} (\$Million)	Number of Farms (Million)	NFI per Farm (RNFIFP) (\$)	Yearly Variation in (RNFIFP) (\$)	Yearly Variation in (RNFIFP) (%)
1933	2,454.10	25,093.20	NA	NA	-40,476.20	6.7	3,723	NA	NA
1934	2,922.70	28,458.90	3,365.60	13.40	-36,733.20	6.8	4,200	477.40	12.80
1935	5,277.70	50,455.80	21,996.90	77.30	-14,358.90	6.8	7,405	3,205.00	76.30
1936	4,310.30	40,739.80	-9,716.00	-19.30	-23,697.60	6.7	6,045	-1,359.80	-18.40
1937	6,004.30	54,783.90	14,044.10	34.50	-9,276.10	6.6	8,256	2,210.50	36.60
1938	4,359.60	40,554.80	-14,229.10	-26.00	-23,127.90	6.5	6,214	-2,042.10	-24.70
1939	4,415.60	41,617.00	1,062.20	2.60	-21,688.40	6.4	6,461	247.70	4.00
1940	4,481.00	41,761.40	144.40	0.30	-21,166.60	6.3	6,577	115.40	1.80
1941	6,488.00	56,762.90	15,001.50	35.90	-5,787.80	6.3	9,020	2,442.80	37.10
1942	9,855.00	79,862.20	23,099.30	40.70	17,688.90	6.2	12,877	3,857.60	42.80
1943	11,734.00	90,053.70	10,191.50	12.80	28,257.70	6.1	14,790	1,912.30	14.90
1944	11,703.00	87,531.80	-2,521.90	-2.80	26,113.10	6.0	14,580	-209.20	-1.40
1945	12,312.00	89,737.60	2,205.80	2.50	28,696.30	6.0	15,040	459.20	3.10
1946	15,067.00	98,156.40	8,418.70	9.40	37,492.40	5.9	16,565	1,525.00	10.10
1947	15,353.00	89,888.80	-8,267.60	-8.40	29,602.10	5.9	15,311	-1,253.90	-7.60
1948	17,663.00	97,693.60	7,804.80	8.70	37,784.30	5.8	16,835	1,524.20	10.00
1949	12,780.00	70,646.70	-27,046.90	-27.70	11,114.70	5.7	12,346	-4,489.10	-26.70
1950	13,648.20	74,743.50	4,096.80	5.80	15,588.90	5.6	13,234	888.10	7.20
1951	15,933.40	81,667.80	6,924.30	9.30	22,890.50	5.4	15,047	1,812.70	13.70
1952	14,960.70	75,104.00	-6,563.80	-8.00	16,704.00	5.2	14,450	-596.70	-4.00
1953	12,979.80	64,319.90	-10,784.00	-14.40	6,297.30	5.0	12,906	-1,543.70	-10.70
1954 ^e	12,373.20	60,623.20	-3,696.70	-5.70	2,978.00	4.8	12,635	-271.70	-2.10
1955	11,304.70	54,585.70	-6,037.50	-10.00	-2,682.20	4.7	11,729	-905.30	-7.20

continued

Table 1. Continued

Year	Net Farm Income ^b (NFI) (\$Million)	Net Farm Income (ARNFI) (1992 = 100) (\$Million)	Yearly Variation (ARNFI) (\$Million)	Yearly Variation (%)	Variation of Actual RNFI from (PARNFI) ^{cd} (\$Million)	Number of Farms (Million)	NFI per Farm (RNFIPF) (\$)	Yearly Variation in (RNFIPF) (\$)	Yearly Variation in (RNFIPF) (%)
1956	11,253.90	52,490.20	-2,095.50	-3.80	-4,400.40	4.5	11,628	-101.20	-0.90
1957	11,084.70	49,976.20	-2,513.90	-4.80	-6,537.00	4.4	11,432	-196.30	-1.70
1958	13,168.00	57,957.60	7,981.40	16.00	1,821.70	4.2	13,692	2,260.40	19.80
1959	10,712.90	46,679.50	-11,278.10	-19.50	-9,079.00	4.1	11,373	-2,319.50	-16.90
1960	11,211.50	48,180.20	1,500.70	3.20	-7,201.00	4.0	12,159	786.30	6.90
1961	11,957.30	50,795.60	2,615.40	5.40	-4,208.30	3.8	13,278	1,119.50	9.20
1962	12,063.80	50,603.10	-192.40	-0.40	-4,023.40	3.7	13,705	426.20	3.20
1963	11,770.00	48,797.80	-1,805.30	-3.60	-5,451.30	3.6	13,660	-44.20	-0.30
1964	10,491.90	42,858.90	-5,938.90	-12.20	-11,012.90	3.5	12,399	-1,261.60	-9.20
1965	12,899.30	51,700.50	8,841.60	20.60	-1,794.00	3.4	15,405	3,005.80	24.20
1966	13,959.90	54,403.50	2,703.00	5.20	1,286.30	3.3	16,703	1,298.70	8.40
1967	12,339.00	46,597.50	-7,806.00	-14.30	-6,142.40	3.2	14,738	-1,965.40	-11.80
1968	12,322.30	44,581.30	-2,016.20	-4.30	-7,781.20	3.1	14,518	-220.40	-1.50
1969	14,293.40	49,389.80	4,808.50	10.80	-2,595.30	3.0	16,462	1,944.70	13.40
1970	14,365.80	47,131.80	-2,258.00	-4.60	-4,476.00	2.9	15,982	-480.70	-2.90
1971	15,011.60	46,838.10	-293.80	-0.60	-4,392.40	2.9	16,138	156.70	1.00
1972	19,455.30	58,214.50	11,376.40	24.30	7,361.40	2.9	20,356	4,217.40	26.10
1973	34,356.20	97,326.40	39,111.80	67.20	46,850.60	2.8	34,473	14,117.50	69.40
1974 ^e	27,267.20	70,897.60	-26,428.80	-27.20	20,799.20	2.8	25,362	-9,111.40	-26.40
1975	25,546.70	60,695.40	-10,202.20	-14.40	10,974.30	2.5	24,072	-1,289.80	-5.10
1976	20,175.40	45,287.20	-15,408.30	-25.40	-4,056.60	2.5	18,135	-5,937.30	-24.70
1977	19,881.40	41,926.10	-3,361.00	-7.40	-7,040.30	2.5	17,072	-1,062.60	-5.90
1978	25,197.50	49,523.30	7,597.20	18.10	934.30	2.4	20,328	3,255.60	19.10

1979	27,414.80	49,646.50	123.20	0.20	1,434.80	2.4	20,369	41.80	0.20
1980	16,141.40	26,750.70	-22,895.80	-46.10	-21,083.70	2.4	10,966	-9,403.90	-46.20
1981	26,879.30	40,720.10	13,969.40	52.20	-6,736.90	2.4	16,689	5,723.50	52.20
1982	23,841.10	33,971.40	-6,748.70	-16.60	-13,108.30	2.4	14,116	-2,572.90	-15.40
1983	14,247.00	19,473.80	-14,497.70	-42.70	-27,228.60	2.4	8,187	-5,929.20	-42.00
1984	25,959.70	34,193.40	14,719.70	75.60	-12,131.60	2.3	14,651	6,464.30	79.00
1985	28,625.20	36,451.30	2,257.80	6.60	-9,496.40	2.3	15,900	1,248.70	8.50
1986	30,902.20	38,349.70	1,898.50	5.20	-7,220.60	2.2	17,046	1,145.70	7.20
1987	37,385.70	45,010.50	6,660.80	17.40	-182.50	2.2	20,339	3,293.80	19.30
1988	38,005.50	44,141.10	-869.40	-1.90	-674.50	2.2	20,056	-283.90	-1.40
1989	45,273.50	50,460.90	6,319.80	14.30	6,022.60	2.2	23,206	3,150.00	15.70
1990	44,747.00	47,786.20	-2,674.70	-5.30	3,725.20	2.1	22,269	-936.10	-4.00
1991	38,671.00	39,735.90	-8,050.30	-16.80	-3,947.70	2.1	18,772	-3,497.40	-15.70
1992	47,918.00	47,918.00	8,182.10	20.60	4,611.70	2.1	22,733	3,961.20	21.10
1993	44,533.00	43,387.60	-4,530.40	-9.50	458.60	2.2	19,707	-3,025.80	-13.30
1994	49,235.00	46,850.30	3,462.80	8.00	4,298.70	2.2	21,318	1,610.60	8.20
1995	37,212.00	34,532.30	-12,318.00	-26.30	-7,642.00	2.2	15,722	-5,595.80	-26.20
1996	54,926.00	49,833.10	15,300.80	44.30	8,036.10	2.2	22,750	7,027.40	44.70
1997	48,623.00	43,025.40	-6,807.70	-13.70	1,605.80	2.2	19,642	-3,107.90	-13.70
1998	44,089.00	38,251.80	-4,773.60	-11.10	-2,790.50	2.2	17,456	-2,186.00	-11.10
1999	43,400.00	36,995.99	-1,255.81	-3.28	-377.31	2.2	19,727	2,271.27	13.01

Source: Constructed from U.S. Department of Agriculture (1986, 1994).

^aAll income series are deflated by the implicit GDP deflator, 1992 = 100.

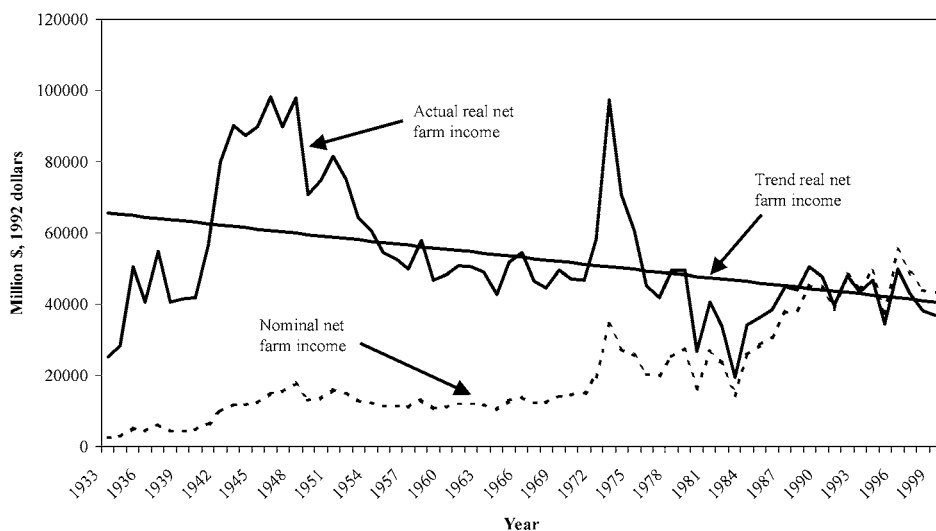
^bIncludes cash marketing receipts, direct government payments, nonmoney items, and other farm related income, and inventory change excluding farm production expenses. Government payments include cash payments and PIK entitlements. Direct payments to farmers began in 1933.

^cA linear trend was fitted, $Y = \alpha_0 + \beta X_i$, where Y is net farm income and X_i ($i = 1933, 1934, 1935 \dots 1999$) is the year in the series.

^dCalculated from actual net farm income (NFI) from column 2 minus predicted net farm income (PNFI).

^eDefinition of "farm" changed. Data prior to 1954 were reconstructed using the new definition of a farm. Data prior to 1974 were reconstructed using the new definition of a farm.

Figure 2. Actual and trend in aggregate real net farm income in the United States, 1933–1999



per farm has been trending upward as the number of farms in the United States declined considerably from 6.7 million farms in 1934 and 1935 to about 2.2 million farms in 1999. The upward trend in real net farm income per farm is attributed to increases in agricultural productivity (output per unit of input) in U.S. agriculture (table 1). Economic Research Service (ERS) analysis has found that farm productivity rose an average of 1.9% annually from 1948 through 1996 (Ahearn, 1998). Productivity of farm inputs rose, but labor productivity in particular rose rapidly as farms mechanized and more efficient practices were adopted.

While levels of income are important to consider, variability is also a key issue for farm income. An examination of key periods in the American economy shows wide variation in aggregate real net farm income (ARNFI; table 2). The post-Depression recovery period, for example, showed 34% average annual variation in ARNFI. Similarly, farm income during the farm crisis years of 1979–1984 varied 39% annually. In contrast, ARNFI varied only 12% annually during and after World War II, and during the post-farm crisis years of 1985 through 1995.⁸ The latter period appears to have been the most stable ARNFI in recent history for American agriculture.

Examining income instability on a per-farm basis is different both in terms of variation in actual dollar amounts and percentage (table 2). In the case of real net farm income per farm (RNFIPF), the years 1964 to 1999 were more unstable when compared to the previous 25 years, 1939 to 1963. Table 2 shows that the average farm enjoyed relatively stable earnings in the World War II period, with an average variation of \$994 or a 6% yearly fluctuation in real net farm income. The Vietnam War and post-FAIR Act (1996–1999) periods experienced similar average yearly variation in RNFIPF in the range of \$3,650 to \$4,200, or approximately 22%. However, it is interesting to note that the post-farm crisis period (1985–1995) was relatively more stable than any other period over the past several decades, with

Table 2. Variation in aggregate real net farm income, various periods, 1933–1999

Period	Description ^a	Average Yearly Variation in Real Net Farm Income (Aggregate)		Average Yearly Variation in Real Net Farm Income (per Farm)	
		±Million Dollars	±Percentage	±Dollars	±Percentage
1933–1938	Post-Depression recovery	8,784	34	1,859	34
1939–1948	World War II	7,812	12	994	6
1949–1959	Post–WWII boom, Korean War and postwar readjustment period	8,093	12	1,157	9
1964–1973	Vietnam War	8,457	16	4,183	23
1979–1984	Farm crisis period	12,159	39	6,019	47
1985–1995	Post–farm crisis period	5,202	12	3,538	17
1996–1999	Post–FAIR ^b Act	7,034	18	3,648	21

Source: Calculated from Table 1.

^aSelection of periods was made based on the landmark dates in American history, in terms of both agriculture and the economy as a whole.

^bFederal Agricultural Improvement and Reform Act of 1996.

an average variation of \$3,538 or a 17% variation in yearly real net farm income. In contrast, the farm crisis period was unstable for an average farm where RNFIFP fluctuated by \$6,019 or 47%.

This analysis suggests that the variation in real net farm income, both ARNFI and RNFIFP, has not diminished over time, both in year-to-year comparisons and predicted value.⁹ Further, Young and Westcott note that under the Federal Agriculture Improvement Reform Act of 1996 (FAIR Act), farm income could become more variable in response to supply and demand shocks. Farming is a risky business because forces (such as weather) beyond the control of the farm operator affect farm income. In recent decades, farmers have turned to off-farm work in order to increase total household income and reduce the impact on farm household income associated with farm income variability. The increased reliance on off-farm income by farm operators has been well documented in a number of studies (Ahearn, 1986; Perry and Hoppe; Sumner; Gunter and McNamara; Hallberg, Findeis, and Lass; Mishra and Goodwin; among others).

Farm Income and Nonfarm Income

Mishra and Mishra and Goodwin found a positive correlation between off-farm employment and farm income variability, indicating that off-farm employment may be an important way for some farm households to diversify their income

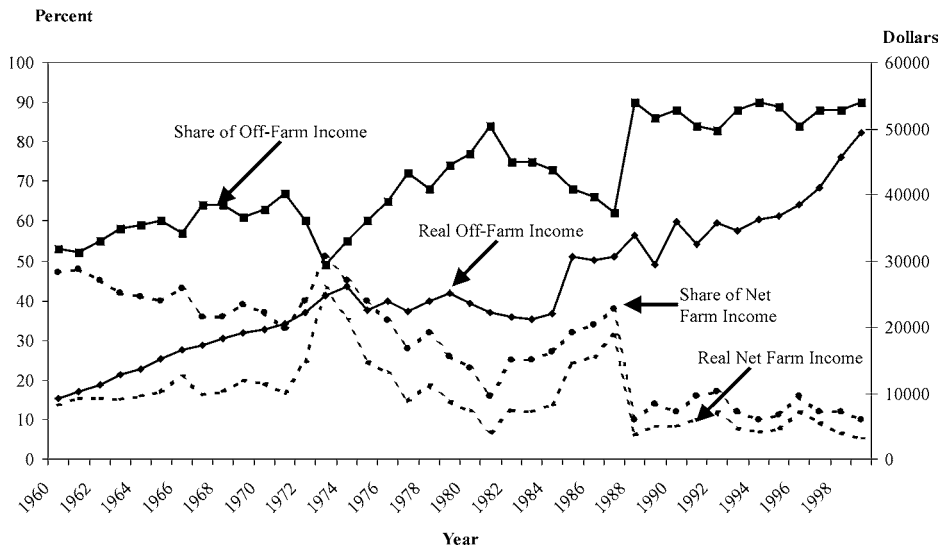
risks. Recent data from the U.S. Department of Agriculture indicate that almost 94% of U.S. farm operator households receive some nonfarm income from either earned or unearned sources (U.S. Department of Agriculture, 1999). In the 1930s, 30% to 41% of farm households' personal income came from off-farm sources (Hoppe and Korb). Farming provided the largest share of personal income (about three-quarters) during most of the 1940s. Then, farming experienced a boom during World War II and its aftermath. Sommer et al. conclude that almost half of farm households in 1994 realized a net loss from farming (negative earnings to the household from farming activities) but had enough nonfarm income to cover the loss and still have total household income near the U.S. average household income. More recently (1999) average farm household income (\$64,347) exceeded U.S. average household income (\$54,842) by more than \$9,505. The number of farmers reporting working off the farm increased from approximately 27% in 1944 to about 58% in 1997 (U.S. Department of Commerce, *Census of Agriculture*, various). Of those reporting working off the farm, approximately 39% worked 200 days or more in 1997, up from approximately 14% in 1944 (U.S. Department of Agriculture, *Census of Agriculture*, various).

Differences in dependence on off-farm income also occur by commodity specialization because different types of farms have different labor and management requirements. Households associated with dairy farms, for example, show the least amount of off-farm work; dairy farms are labor-intensive, limiting the hours that operators can devote to off-farm work (Lass and Gempe saw). In a recent study, Sommer et al. report that dairy farm operators worked the most hours on the farm, an average of 3,357 hours per year (compared to 1,861 hours per year for cash grain operators), and thus had little time for off-farm work. Farm households with specialized enterprises, such as poultry and egg producers and vegetable and melon producers, tend to have higher average farm income, and farm income makes up a larger share of total household income. General crop producers and other farm households with low farm incomes generally rely more on off-farm sources of income and tend to have considerable farm income losses (Ahearn, 1986; Sommer et al.).

Findeis and Reddy and Ghebremedhin and Arnaud-Golden point out that among small- and medium-sized farms, the proportion of family income earned from off-farm activities has increased significantly. U.S. Department of Agriculture (2001) shows the importance of off-farm income in the total farm family income. Total nonfarm income¹⁰ accounted for approximately 90% of the total income received per farm household in 1999, up from 59% in 1973 (figure 3). The larger the farm, the less likely the farm operator is to have a major occupation off the farm, and the more likely that farm income will represent a major share of total household income. However, even in farm households with a half million dollars or more in farm sales, one-third of total household income is from off-farm sources.¹¹ Among all commercial farm households, slightly less than 50% earned more income from farming than from off-farm sources (U.S. Department of Agriculture, 1999).¹²

A relevant question then is whether nonfarm income has helped in reducing the variability of total farm household income (total includes income from farming and nonfarm activities)? Farm households have been considered here for three reasons: (1) the unit of analysis is disaggregated and thus investigating the household gives a better understanding of the problem, (2) aggregate data (sector level)

Figure 3. Shares of net farm and off-farm income and real net farm and off-farm income for farm households in the United States, 1960–1999



on off-farm income are not available, and (3) data on households' income from farming and off-farm activities are readily available at the national level. To answer the variability reduction question, the variance in total farm household income (TFHI) is decomposed into its components as in Tweeten (1983). TFHI in this case is defined as the sum of farm household income from farming (HFI) and off-farm income (HOFI). Table 3 presents the results of this analysis. Results for 1960 through 1999 show that HFI accounts for a greater absolute (measured by variance), and relative variation, as measured by the coefficient of variation, in TFHI, than did HOFI. The overall variability in farm household income was lowest during the 1960–1963 period, with farm income contributing most to this variability.

A similar result was obtained when the aggregate series for 1960 through 1999 was divided into specific periods, based on data availability, similar to the ones in table 2. Except for the post-FAIR Act period (1996–1999), HFI contributed more to total variation in TFHI from all sources of income than did HOFI. The relative and absolute variations were lower for nonfarm income than for income from farming. In the post-FAIR Act period results are different. Table 3 shows that off-farm income accounted for a greater absolute variation in total farm household income than farming income. However, when the relative variation measure (CV) is taken into consideration, income from farming accounts for greater variation in total household income. One possible reason could be that the sustained economic growth and the strong demand for workers in the nonfarm economy encouraged households to work more off the farm and bring more money home to compensate for the reduced earnings from farming in the most recent period (since 1996; figure 3). As the share of income earned from farming declines, farmers attempt to supplement their household income with off-farm earnings, but such efforts are more likely to be successful only when there is a robust nonfarm economy.

Table 3. Components of estimated variance of U.S. farm household income^a from all sources, 1960–1999

Variance source	1960–1999 ^b (\$ 000 ^c)	1960–1963 (\$ 000)	1964–1973 (\$ 000)	1974–1978 (\$ 000)	1979–1984 (\$ 000)	1985–1995 (\$ 000)	1996–1999 (\$ 000)
σ^2 (HFI ^d)	84.84	2.37	23.86	6.16	2.65	29.99	0.62
(CV, %)	(50.51)	(14.18)	(38.64)	(20.69)	(22.85)	(67.82)	(12.97)
σ^2 (HOFI ^e)	23.92	0.25	10.82	0.75	2.12	7.58	14.22
(CV, %)	(35.99)	(5.61)	(17.55)	(3.73)	(6.43)	(8.30)	(8.80)
2σ (HFI.HOFI)	-13.49	0.37	11.02	0.18	0.75	-8.83	-1.36
(CV, %)							
σ^2 (TFHI ^f)	95.27	2.99	45.70	7.09	5.52	28.74	13.48
(CV, %)	(26.96)	(2.62)	(29.58)	(16.56)	(30.83)	(7.64)	(6.84)

Source: Data for 1960–1987 were obtained from U.S. Department of Agriculture (1994). Data for 1988–1999 were obtained from the *Farm Costs and Returns Survey/Agricultural Resources Management Study Survey*, Economic Research Service, USDA.

^aThis income series was developed to be definitionally consistent with the Current Population Survey (CPS) family or household income series (gross rental value of farm dwellings, the value of home-produced food, and the value of the change in inventories were subtracted from net farm income, while the value of wages that farm businesses paid members of farm operator households was added when it became available in 1982). This series was based on the assumption that farm operator households received all of the income from the farm business, an assumption that is no longer valid. The estimates presented in this table utilize the methodology presented in Ahearn (1986).

^bSelection of periods was made based on the landmark dates in American history, in terms of both agriculture and the economy as a whole.

^cAll income series are deflated by the implicit GDP deflator, 1992 = 100.

^dHFI is defined as households' net income from farming.

^eHOFI is defined as income from off-farm employment.

^fTFHI is defined as total farm household income and HFI.OFI is defined as the covariance term between net farm and off-farm income.

However, Lee; Huffman; and Ahearn (1986) have noted that working off the farm by farm operators is also related to the opportunity cost of time, and human capital investments.

Summary and Implications

This study has examined the variability in real net farm income, both in the aggregate and on a per-farm basis, and the role of off-farm income in reducing the variability in total farm household income. Evidence presented suggests that farm household income variability still exists and that the variation in the incomes of farm families has not diminished over the past 67 years. In fact, variation in real net farm income between years has been wide. The greater availability of nonfarm jobs and earned off-farm income have played an important role in reducing the variability in total income earned by farm households in this country. Results show that off-farm income has made a major contribution to the household income level of farm families since the 1970s. On average, farmers are no longer at an income disadvantage relative to nonfarmers and not all farmers with low farm incomes have low household incomes. The number of farm families whose income is only derived from farming is a relatively small proportion of all farm families. Off-farm opportunities have contributed to the stability of farm household income and the number of farm residents in recent years.

Off-farm income has played a prominent role in supplementing low net farm returns. Rural development policies that encourage the development of off-farm employment opportunities serve to aid both low-income families that leave agriculture and families that prefer to pursue dual employment on-farm and off-farm. The larger and more diverse the local economy, the more likely that an off-farm employment strategy will increase farm household income. Vocational-technical training and career orientation programs can increase the ability of farm household members to compete in today's job market.

Acknowledgments

The views expressed here are not necessarily those of the Economic Research Service or the U.S. Department of Agriculture. We thank Hisham El-Osta, Robert Hoppe, James Mikesell, and Kenneth W. Erickson, as well as three anonymous reviewers for providing many helpful comments and suggestions. Any remaining errors are the responsibility of the authors.

Endnotes

¹ Defined as households of primary operators of farms organized as individual operations, partnerships, and family corporations. These farms are closely held (legally controlled) by their operator and the operator's household. Farm households exclude households associated with farms organized as nonfamily corporations or cooperatives, as well as households where the operator is a hired manager. Household members include all persons dependent on the household for financial support, whether they live in the household or not. Students away at school, for example, are counted as household members, if they are dependents.

² These programs were intended to benefit farmers by stabilizing income derived from farming, and consumers by reducing fluctuations in commodity prices (Hallberg).

³ Income measured here includes income from farm and off-farm sources.

⁴ See Johnson et al. and Ahearn (1986) for details on how the series is constructed and interpreted.

⁵ Implicit GDP deflator (1992 = 100) deflates all income series in this study.

⁶ Between 1946 and 1948, farm prices increased significantly (postwar boom). Cochrane (1953) points out several factors as major forces in realizing record levels of farm income in the last half of the

1940s. These include the two-year price guarantee to farmers after the war, strong domestic demand for food, maintenance of strong foreign demand through food assistance programs to war-torn Europe and parts of Asia, and lifting of food rationing and price controls in 1945.

⁷ A linear trend was fitted, $Y = \alpha_0 + \beta X_i$ ($i = 1933, \dots, 1999$), where Y is net farm income in \$ million and X is the year in the series. The resulting equation is: $Y = 794970.1 - 377.341 X$. The coefficient of the variable X was significant at the 1% level with t -statistics at 3.46.

⁸ During this period, agriculture was moving towards becoming more market oriented. During this period we had two farm bills, the Food Security Act of 1985 and the Food, Agriculture, Conservation, and Trade Act of 1990 (FACT, 1990). The main goals of the Federal Agriculture Improvement Reform Act of 1996 (FAIR Act of 1996) were to further increase market orientation, reduce government spending on agricultural programs, help maintain farm income through expanding exports, and protect the environment.

⁹ This result is consistent with the findings of Tweeten (1983). He concludes that net farm income from farm sources was relatively much more unstable on small farms than on larger farms. Published data from the U.S. Department of Agriculture (1996) shows that 73% of the farm households operate small farms. Our analysis is limited due to lack of national time-series data by farm size.

¹⁰ Nonfarm income includes income from off-farm activities, such as wages and salaries, nonfarm businesses, interest, dividends, rents, and transfer payments, with wages and salaries accounting for about three-fourths of the reported total.

¹¹ In the case of commercial farms, Perry and Hoppe note that nonfarm income is a significant portion of total household income and that the majority of the spouses in these households worked off the farm.

¹² A commercial farm is defined as a farm business with annual gross sales of at least \$50,000. Nonfarm income accounts for almost 100% of total farm household income for small farms, 70% for medium farms, and 23% for large farms during 1996. For more detailed information, refer to Sommer et al.

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