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THE EFFECTS OF RECESSION ON THE RURAL-FARM ECONOMY

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This paper consists of two parts. The first is a general view of the consequences of recession, with reference to historical U.S. business downturns. The second considers more specifically the effect of rural industrialization on the sensitivity of the rural economy to general business conditions. Attempts are made to estimate effects of rural industrialization during the 1974-75 recession.

I. THE RELATIONSHIP BETWEEN GENERAL BUSINESS FLUCTUATIONS AND RURAL ECONOMIC INSTABILITY

Although it seems obvious that fluctuations in the state of the general economy should have important consequences for rural economy, it is difficult to specify exactly how and why changes in general economic conditions affect rural areas. A general framework still pertinent today was provided over 30 years ago by W. T. Schultz [4]. The central economic mechanism for cyclical variation is change in the demand for food, coupled with very inelastic aggregate agricultural supply.

In considering effects of recession, Schultz had only the pre-World War II experience to draw on; this paper investigates the connection between general business downturns and rural-farm economy in the post-World War II period. There are reasons to expect the relationship between nonfarm and farm sectors to have changed appreciably in recent years. Perhaps most important are those emphasized by Firch [1], i.e., effects of macroeconomic built-in stabilizers and stabilizing fiscal policies.

The original intention was to look specifically at the 1974-75 recession. Some state data for the 1974-75 period are considered later. However, the 1974-75 experience has been a rather special one for U.S. agriculture. Its peculiarities limit the generality of conclusions that can be drawn from the phenomenon as it pertains to agriculture. Indeed, it has been said that Soviet activities in 1972, along with OPEC, are a *cause* of the immediately past inflation and general recession. In recognition of this, someone might now write a book called *The Economy in An Unstable Agriculture*. Nonetheless, every recession is unique, and it would probably be a mistake to let special characteristics of the past several years prevent consideration of the 1974-75 recession in the context of earlier business contractions.

Events in Recent Recessions

Table 1 provides basic data for an overall view of how the 1974-75 recession compares with previous downturns in the post-World War II period. The first notable fact is that there is no such thing as a "typical" postwar recession as far as the agricultural sector is concerned. The normal case would presumably be one in which employment and real income in agriculture fell along with employment and real income in the rest of the economy. However, there were only two postwar recessions, 1948-49 and 1974-75, when both real farm income fell and agricultural employment declined at greater than its trend rate of around 3½ percent per year.

In the one other recession during which agricultural employment fell sharply, that of 1957-58,

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TABLE 1. CHARACTERISTICS OF POSTWAR RECESSIONS: PERCENTAGE CHANGE IN VARIOUS ECONOMIC INDICATORS (ANNUAL RATES)

Economic Indicator	Dates of Recessions*					
	Nov. 1948- Oct. 1949	July 1953- May 1954	Aug. 1957- April 1958	April 1960- Feb. 1961	Dec. 1970- Nov. 1971	Dec. 1973- May 1975
Real GNP	-1.6	-1.6	-4.6	-1.9	-0.8	-5.1
Price level (GNP deflator)	-1.8	+1.3	+2.3	+1.7	+5.3	+9.7
Civilian employment (seasonally adjusted)	-1.4	-2.0	-3.0	-0.7	0.0	-1.5
Agricultural employment (seasonally adjusted)	-6.6	-0.1	-9.7	+0.4	+0.8	-5.1
Net farm income** (seasonally adjusted)	n.a.	-28.4	+18.4	+2.5	+2.8	-22.5
Real net farm income (1958 dollars)	n.a.	-29.7	+16.6	+1.3	-2.5	-32.2

*These are dates established by the National Bureau of Economic Research, except for 1973-75, in which case NBER has not yet published its "official" turning points. December 1973 is the date used by the Federal Reserve Bank of St. Louis in its analyses of the recession. May 1975 is the month in which the unemployment rate peaked. The calculations use quarterly data from the pre-recession peak to the trough quarter.

**Total net farm income, which includes unrealized change in the value of inventories.

n.a.—not available.

real farm income showed a large increase. In 1960-61 and 1970-71, relatively mild recessions, agricultural employment actually increased. In the 1960-61 case real farm income also increased. In 1953-54, farm employment was relatively well-insulated from the recession, but real farm income fell about 30 percent. In the 1974-75 recession, agricultural employment fell a little over five percent, about the same rate as nonfarm employment. The decline in net farm income, though it looks catastrophic, was from the highest quarterly level in history, \$38 billion in the fourth quarter of 1973, or around \$13,000 per farm. The only generalization one might make from these figures, albeit a loose one, is that real farm income falls more often than not during postwar recessions, while level of agricultural employment appears equally likely to be above or below trend during recessions.

Figure 1 provides a view of agriculture's performance during recession in context of long-term trends, plotting real net farm income quarterly from 1950 (when the first quarterly data became available)

through the fourth quarter of 1975. Real net farm income follows an erratic course, but one quite independent of the business cycle. Indeed, it would probably be impossible for anyone to look at this chart, undated, and pick out periods of recession.

The time series of total agricultural employment also reveals no strong patterns. If one were to hypothesize that farm employment falls with non-farm employment during recessions, he would find no support in quarterly data on agricultural employment. On the other hand, one might take the contrary view that, during recession, off-farm migrants tend to move back to farms. This would lead to *increased* agricultural employment during periods of recession. Though there is some slowing down of rate of decline of agricultural employment in the 1953-54, 1960-61 and 1970-71 recessions, it is small. In general, the countercyclical theory of agricultural employment does not bear up much better than the procyclical hypothesis. Actually, what occurs between 1949 and 1971 is a quite stable decline of about 3½ percent per year in agricultural employment.¹

¹ The data on agricultural employment are derived from the monthly Current Population Survey of some 47,000 households, which contains questions on what kind of work each household member was doing and defines his/her primary business or industry. These data do not reveal some aspects of the farm labor force which have undergone considerable change: the extent of multiple job-holding, work by family members, hired workers versus farm operators, labor quality. Therefore, they probably do not provide a reliable indicator of the labor input in agriculture or of secular changes in labor input over time. Nonetheless, they are more likely to be a useful indicator of short-term cyclical movements in employment in agriculture, which is what the data are intended to be used for.

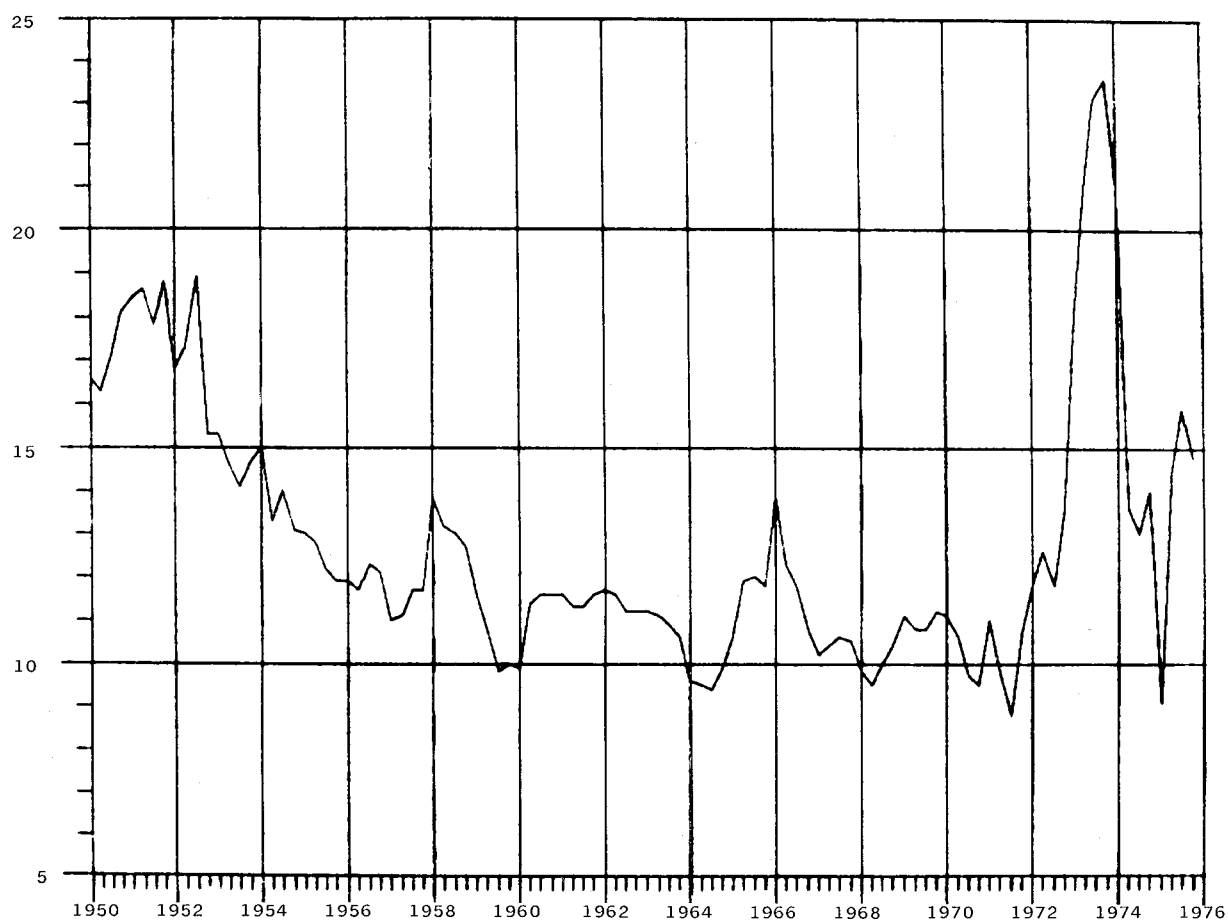


FIGURE 1. TOTAL NET FARM INCOME, BY QUARTER (BILLIONS OF 1958 DOLLARS)

Both real income and employment economic events in agriculture, then, seem quite independent of ups and downs of nonfarm economy. This is a very different conclusion from that which agricultural economists drew out of the Great Depression, e.g., Schultz's statement that "instability in farm income has its origin chiefly in business fluctuations" [4, p. 214].

Off-Farm Income

Nothing said so far has a direct connection with rural development or rural industrialization. It is interesting that the major element neglected in Schultz's 1945 view is the nonagricultural part of rural economy. In his recent address to the North-eastern Agricultural Economics Council [5], Schultz mentioned particularly his omission of off-farm work by farm people. As off-farm work has increased, there ought to be an increasingly observable connection between recession and agriculture by means of labor markets rather than farm product markets. In particular, the part of off-farm income composed of wages and salaries should vary directly with the business

cycle. As urban workers are laid off and experience real income declines, so should rural residents who work in non-farm industries.

To examine this source of connection between recession and the rural economy, Figure 2 shows the time series of off-farm income of farm operators, annually, from 1934 to 1974. Data are in real, per capita terms. There is a recession-related dip in income in 1938, and in the postwar period in 1954, 1970-71 and 1975. However, except in 1954, declines are very small. The main notable feature of the chart is the take-off in the rate of growth after 1960. Between 1934 and 1960 there is a trend rate of growth in real nonfarm income per farm of about 3½ percent. Between 1960 and 1974 the trend rate of growth is about seven percent.

The apparent implication of these charts, that neither farm nor nonfarm income has a strong relationship with general business fluctuations, is startling enough that a more formal statistical test is in order. The following regressions are intended to test, admittedly in a crude way, the hypothesis that recessions have had important impact on the

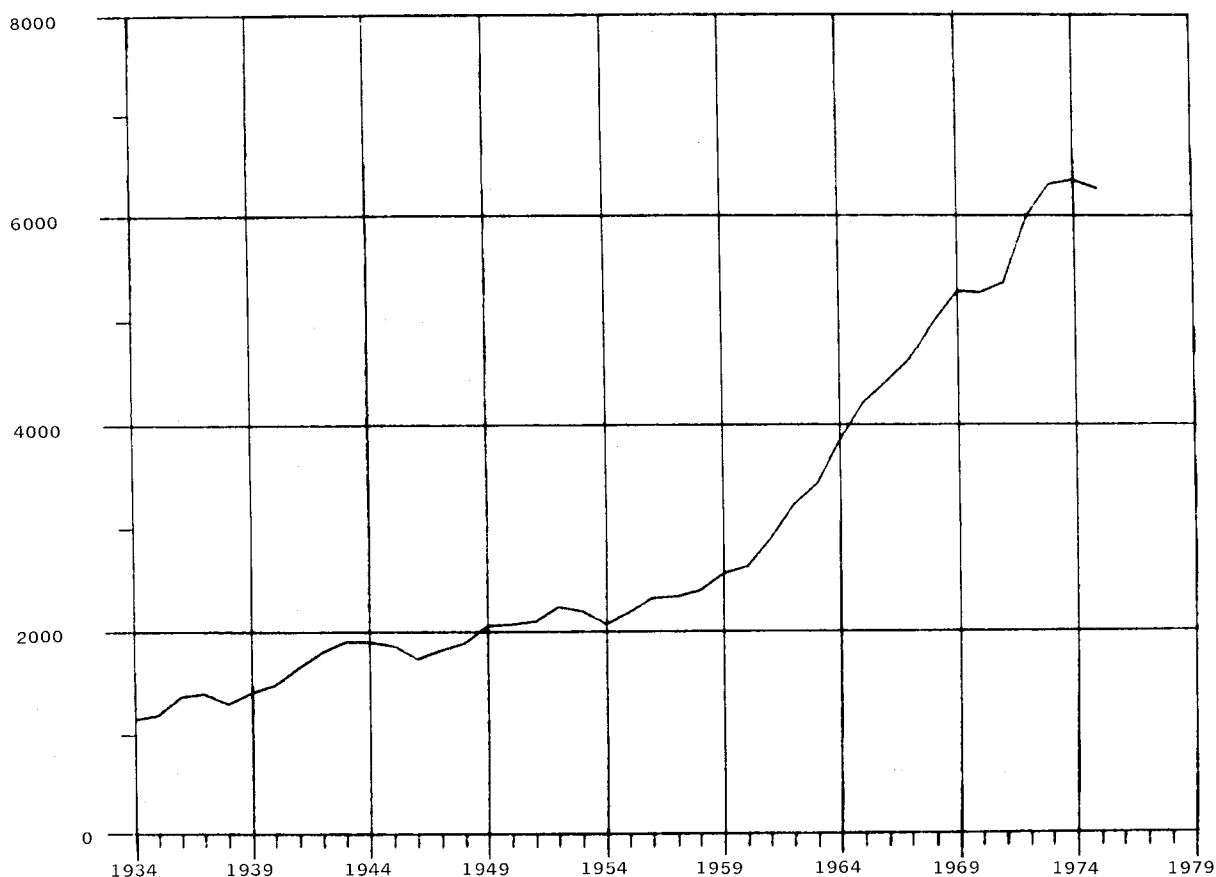


FIGURE 2. PERSONAL INCOME OF THE FARM POPULATION FROM OFF-FARM SOURCES, PER FARM, IN 1972 DOLLARS

well-being of rural people in the postwar period. The analysis consists of regressions of real income per household on trend, with dummies for years in which the troughs of recessions occurred.

Real Nonfarm Income of Farm Operator Households, Per Farm, 1947-74

$$YN = 1,312 + 108 T1 + 162 T2 - 89D$$

(3.7) (14.6) (0.5)

$$\bar{R}^2 = .926 \quad (1)$$

where

YN = income of farm operator households from nonfarm sources per farm, deflated by the implicit GNP deflator, 1958=100

T1 = 1 in 1947, 2 in 1948, and so on through 1959, after which T1=0

T2 = 14 in 1960, 15 in 1961, and so on up to 1975. T2=0 before 1960

D1 = 1 in 1949, 1954, 1958, 1961, 1971 and 1975 and equals zero otherwise.

Figures in parentheses are t ratios. This dummy variable estimates the effect of a recession-trough year on income. The coefficient gives a point estimate that postwar recessions have reduced real annual income per family by an average of \$89; however, this coefficient is insignificantly different from zero.

Real Farm Income Per Capita, 1947-74

A similar regression for farm income follows:

$$YF = .575 + 20.0 T + 10.3 D \quad \bar{R}^2 = .300 \quad (2)$$

(3.7) (0.1)

From the \bar{R}^2 of .3 it is obvious that YF, real farm income per capita, is much more variable around trend than the nonfarm income of farm operator households. The sign on the coefficient of D implies that farm income is higher in recession years. However, as in regression on nonfarm income, the effect is not significantly different from zero.

Finally, consider the ratio of farm household income from all sources, farm and nonfarm, to income of nonfarm households. This ratio is plotted

in Figure 3. During the recession which troughed in 1938, agriculture fared worse than the rest of the economy, as indicated by a decline in farm/nonfarm personal income.² The same pattern continued in the first post-World War II recession (1948-49). But by 1953-54 there is no special effect on relative farm/nonfarm incomes and in the succeeding years through 1975 declines in relative farm household income, which occur in 1956-58, 1959, 1964 and 1967, have no apparent connection with general business conditions.

Meaning of the Results

Table 1 and Figures 1 through 3 do not show a strong, predictable relationship between income of rural-farm households and fluctuations in the general economy in the post-World War II period. This does

not mean that the rural sector behaves like an independent economy over a longer time span. However, the fact that substantial short-term variations, which occur in real incomes of rural-farm households, are not clearly connected with general business fluctuations does indicate that other sources of instability dominate.

What are these other sources of instability? And what changes have occurred since the pre-World War II period to account for change in sources of instability? Firch [1] has provided evidence that the degree of instability in the postwar period up to the early 1960s was reduced substantially, and that a sufficient explanation for this change is an increased stabilization of the general economy. Thus, changes in fiscal institutions, or better luck, increased stability of income and employment in *all* sectors of the

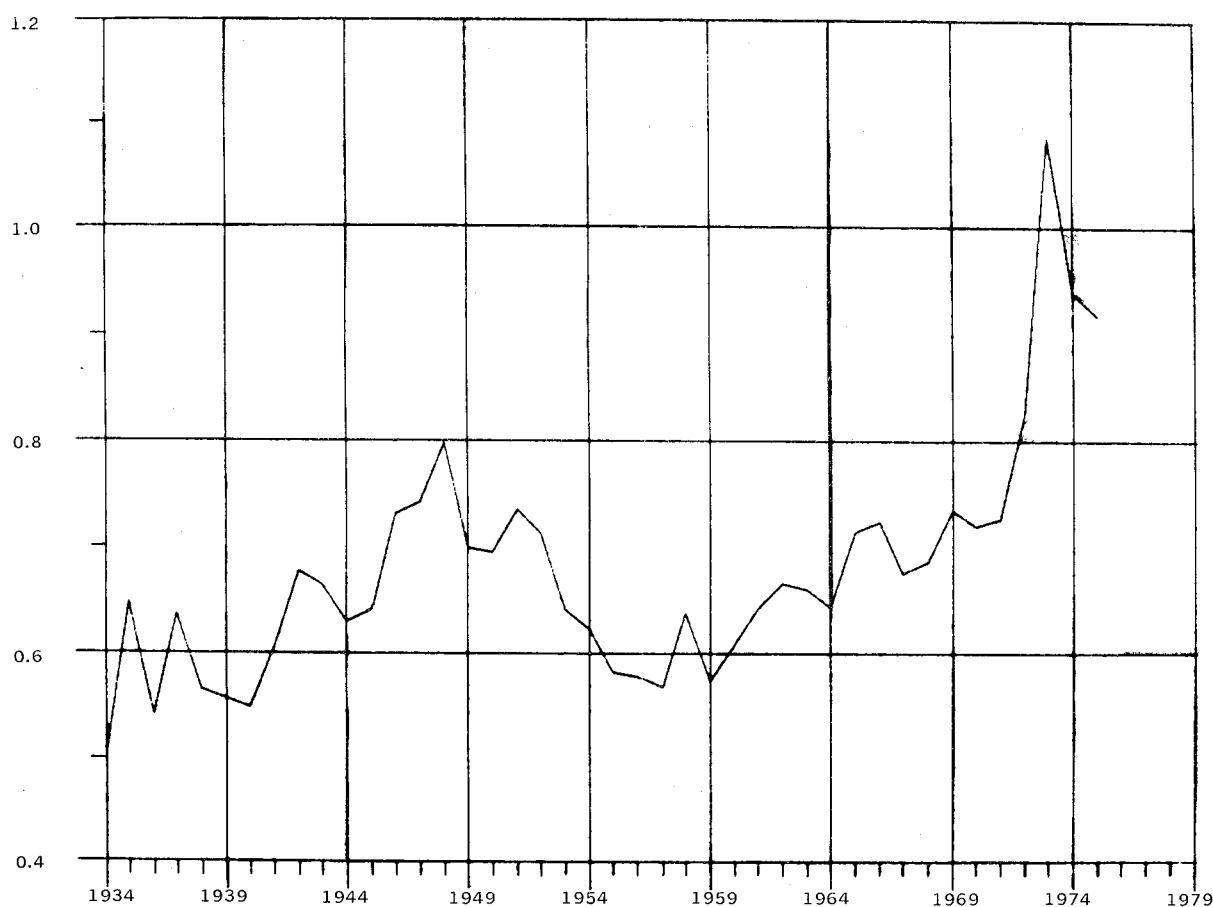


FIGURE 3. RATIO OF FARM/NONFARM PERSONAL INCOME PER HOUSEHOLD

²From the data presented in Schultz's chart [4, p. 215], the farm sector also fared worse in 1921 and in the Great Depression.

economy. This leaves dominant influence on agricultural instability to weather, foreign demand and supply response, factors which Schultz had not neglected in his original work, and which had also been emphasized by Hathaway [2]. That these specifically agricultural sources of instability can generate fluctuations as great as those produced in the prewar period by general business conditions,³ is an important addition to Schultz, Hathaway and Firch.

Implications of changed circumstances for that which can be expected to occur in the future are quite different for commercial and noncommercial farmers. Because this distinction is difficult to define precisely, perhaps it would be better to refer to agricultural and nonagricultural economic activities of rural people.

For specifically agricultural income, there is no apparent reason to expect return to prewar cyclical variation. Recall that the main economic mechanism for cyclical farm income variation is reduction in demand for food in recession, coupled with very inelastic aggregate agricultural supply. Though I am not aware of hard evidence on this, it might be expected that increasing human capital intensity of farming has improved and will continue to improve farmers' ability to adjust to disequilibria [6]; and since supply response originated in adjustment to disequilibria, the hypothesis is that the aggregate agricultural supply function is becoming more elastic over time.

On the demand side, evidence that income elasticity of demand for food decreases with real economic growth [3, p. 92] indicates that demand for agricultural products will be increasingly insensitive to cyclical income fluctuations.⁴ The spread of federal food, nutrition and welfare programs, notably food stamp and school lunch programs, is having the same effect. Thus, both supply and demand factors suggest continuing decline in sensitivity of farm income to general economic conditions.

Nonagricultural activities, which may be done off-season by "commercial" farmers or at any time by their wives or dependents, should continue to be closely connected with general economic conditions. Indeed, with the spread of unemployment insurance coverage and labor and welfare legislation, the connection may be even closer than in the past. But this

will occur because all nonagricultural workers will increasingly be working in a more nearly unified labor market, a reason quite different from that emphasized by Schultz, Hathaway and Firch. However, the weak connection between recession and real nonfarm income of rural residents, as shown in Figure 2 and regression (1), suggests further study of this issue might be useful.

II. EFFECTS OF INDUSTRIALIZATION OF RURAL AREAS

Development of off-farm employment is not or need not always be a matter of increased mobility and job search by farmers for distant nonfarm work. These labor-market developments have, as a capital market counterpart, location of nonfarm industry in farming areas—the industrialization of the rural economy. How does industrial development of a rural area and nonfarm work by farm residents influence its economic sensitivity to general economic conditions?

There are at least three hypotheses to be considered:

1. The existence of both rural industrial and agricultural employment in the same area maximizes flexibility in reallocating labor in response to changing conditions. Therefore, employment and income will be more stable in an industrialized area than in a rural area that is not industrialized.
2. Even in relatively unindustrialized rural areas, sufficient flexibility at the margin is available, allowing adjustments to changing economic conditions. Therefore, stability of employment and income will be about the same whether a rural area is highly industrialized or not.
3. Industrial firms in rural areas tend to be small, and are especially vulnerable to recession and boom. Therefore, employment and income will be less stable in an industrialized rural area than in a nonindustrialized rural area.

Comparisons of States in 1973-75

There are no nationwide data that allow a straightforward test of these hypotheses. The time-series results above, showing little effect of recession on nonfarm income, suggest that the second or first hypothesis may be correct. These were crude tests, though. They did not permit comparison of similar rural areas varying in degree of industrialization.

³It could be argued from our current perspective that Firch underplayed the stabilizing consequences of U.S. farm programs as opposed to general macroeconomic policy. Also, economists as a group appear to have less confidence in the stabilizing capabilities of macroeconomic policies in 1975 than in 1964.

⁴The low and declining income elasticity also implies a decreasing share of food in consumers' budgets, which in turn implies, *ceteris paribus*, a declining price elasticity of demand. Food stamp and related programs, because benefits increase with increasing food prices, should also reduce the price elasticity of demand. Therefore, increased agricultural price and income instability may be induced by given crop supply or foreign demand shifts.

To investigate effects of recession, it is necessary to have time-series data for business contraction periods. This requirement rules out U.S. censuses and other cross-sectional samples of individuals. Time-series data available, however, pertain to large aggregates—states or the whole country.

The best available data, crude as they are, for testing effects of rural industrialization in a recession, are state data on unemployment. These are available for precisely defined time periods, even if not for any narrowly defined population, by state. Table 2 shows unemployment rate by state for early December 1973 and May 1975. The former date just precedes the recession and the latter is its trough in terms of U.S. unemployment rate, which peaked at 8.9 percent that month. It would be better, of course, to use data for particular counties, towns or industries, and to look at rural and urban residents separately, but there are no such disaggregated data.

To make use of state-aggregate data, regressions were estimated explaining change in the insured unemployment rate between early December 1973 and May 1975. While the phenomenon to be investigated pertains to rural areas, not entire states, having data for all areas of each state has one advantage: It allows an explicit test of the general hypothesis underlying all three of the special hypotheses listed above—that “rurality” *per se* has something to do with an area’s sensitivity to recession.⁵

One reason why a state’s rurality might make a difference in its recession experience could be that, in a rural area, a worker can reallocate time to self-employment rather than becoming an unemployed labor force member. Measuring rurality by the fraction of a state’s population classified by the U.S. Bureau of the Census as rural-farm (a household on a place of ten or more acres with \$50 or more sales of agricultural products or on a place of less than ten acres with \$250 or more sales per year), the hypothesis is that the greater fraction rural-farm, the smaller the increase in the state’s unemployment rate.

The three hypotheses listed above predict what will happen to changes in unemployment rate, *given* a state’s rurality as rural industrialization increases. Rural industrialization, for present purposes, concerns nonfarm jobs of rural residents who, in the absence of rural industrialization, would be attached to the agricultural labor force. The index of rural industrialization used for comparative state analysis is

the fraction of rural-farm family income composed of wages and salaries rather than farm income.

State data for both “rurality” and “rural industrialization” are taken from the 1970 Census of Population (Table 2).

There are two ways that state cross-sectional regressions might be specified. The first explains change in state unemployment rate during the 1974-75 recession as a function of “rurality” and “rural industrialization.” Using data of Table 2, this regression is:

$$\Delta U = -2.88 + 7.35 R + 12.60 W \quad \bar{R}^2 = .356 \quad (1)$$

(1.69) (4.76)

where

ΔU = increase in unemployment rate between December 1973 and May 1975

R = fraction of population with rural-farm residence, and

W = ratio of wages and salaries to total income of rural-farm families.

Figures in parentheses are *t* ratios. The main result is that states with higher wage and salary components of rural farm family income, i.e., states with more rural industrialization, experienced significantly greater increases in unemployment. This result supports hypothesis (3) of the list above.

A second approach introduces rural industrialization only by means of an interaction term. The logic of this second approach is that rural industrialization only makes a difference in state unemployment rate if the rural sector is an important part of that state. Therefore, rural industrialization should not be introduced independently but should be used to modify the effect of rurality, i.e., be introduced in the form of an interaction term. The resulting regression is:

$$\Delta U = 3.98 - 33.85 R + 80.14 W \cdot R \quad \bar{R}^2 = .209 \quad (2)$$

(3.72) (3.17)

again using the data of Table 2.

Although regression (2) seems preferable to (1) on theoretical grounds, the former has a substantially lower \bar{R}^2 . This suggests that rural industrialization has influence over and above that indicated by size of state farm population. It could mean that the “rural

⁵ Since the unemployment rate measured is “insured” unemployment, i.e., unemployment covered by employer/employee financed unemployment compensation schemes, many rural people are not captured at all, notably those who are self-employed. The insured unemployment rate focuses on the subset of rural people we are interested in, namely those working in nonfarm jobs.

TABLE 2. STATE DATA ON UNEMPLOYMENT AND RURAL POPULATION

State	Unemployment Rate *		Change (U)	Rural-Farm Total Population**	Fraction of Farm Income from Wages and Salaries**
	May 1975	November 1973			
Alabama	7.5	2.0	5.5	.046	.630
Arizona	7.3	2.3	5.0	.013	.571
Arkansas	9.4	2.4	7.0	.090	.534
California	7.4	3.9	3.5	.009	.505
Colorado	4.2	1.0	3.2	.039	.473
Connecticut	7.3	3.0	4.3	.005	.575
Delaware	5.7	1.7	4.0	.021	.400
Florida	5.5	1.3	4.2	.011	.591
Georgia	7.0	1.1	5.9	.037	.587
Idaho	5.8	3.8	2.0	.132	.477
Illinois	6.5	1.7	4.8	.039	.477
Indiana	6.7	1.4	5.3	.072	.592
Iowa	4.1	0.9	3.2	.181	.367
Kansas	4.0	1.4	2.6	.106	.412
Kentucky	7.2	1.8	5.4	.119	.560
Louisiana	6.3	2.7	3.6	.031	.570
Maine	8.9	3.6	5.3	.023	.587
Maryland	6.3	1.9	4.4	.016	.541
Massachusetts	8.6	4.3	4.3	.003	.592
Michigan	10.0	2.7	7.3	.031	.645
Minnesota	5.3	2.4	2.9	.112	.454
Mississippi	7.0	1.2	5.8	.095	.603
Missouri	6.3	2.3	4.0	.077	.511
Montana	6.8	4.0	2.8	.112	.351
Nebraska	4.0	1.5	2.5	.161	.295
Nevada	7.6	5.0	2.6	.016	.474
New Hampshire	7.8	1.5	6.3	.012	.574
New Jersey	8.6	4.1	4.5	.004	.586
New Mexico	6.3	3.1	3.2	.036	.480
New York	7.2	3.4	3.8	.010	.541
North Carolina	8.0	1.1	6.9	.074	.591
North Dakota	5.2	2.2	3.0	.246	.300
Ohio	5.9	1.2	4.7	.035	.614
Oklahoma	4.6	2.0	2.6	.068	.514
Oregon	8.0	5.4	2.6	.049	.592
Pennsylvania	8.0	3.0	5.0	.019	.589
Rhode Island	8.6	4.3	4.3	.003	.641
South Carolina	9.2	1.4	7.8	.043	.636
South Dakota	3.7	1.5	2.2	.243	.298
Tennessee	7.8	1.6	6.2	.081	.645
Texas	2.6	1.1	1.5	.034	.486
Utah	5.4	2.4	3.0	.025	.597
Vermont	9.5	4.3	5.2	.059	.441
Virginia	5.4	0.6	4.8	.042	.592
Washington	8.8	6.8	2.0	.033	.535
West Virginia	6.0	2.7	3.3	.033	.649
Wisconsin	6.8	2.2	4.6	.094	.491
Wyoming	2.8	0.9	1.9	.093	.429

*SOURCE: U.S. Department of Labor, *Unemployment Insurance Claims*.

**SOURCE: U.S. Census of Population, 1970, "State Reports," Table 57.

industrialization" variable is picking up effects of some left-out variable which is correlated with change in unemployment. It also suggests that in future work more explicit attention be given to rural non-farm population.⁶

In any case, both specifications indicate that increased rural industrialization is associated with greater unemployment increase in the 1973-75 period.

Residuals from equations (1) and (2) indicated a tendency for underpredicting unemployment increase in Southern states. The unemployment increase was underpredicted by more than two percentage points in Arkansas, Georgia, Mississippi and Alabama. Whether this is attributable to specific industries in these states, special characteristics of the labor force or other institutional factors, seems impossible to determine. To see what difference the special nature of Southern states had on regressions, they were reestimated including a dummy variable equal to one for ten Southern states (Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas and Louisiana), and zero otherwise. Equation (2), as reestimated, becomes

$$\Delta U = 3.9 - 19.3 R + 39.1 W \cdot R + 1.65 D$$

(2.35) (1.71) (3.72)

$$\bar{R}^2 = .406 \quad (3)$$

where D is the regional dummy. Its coefficient indicates that, in the 1974-75 recession, holding W and W·R constant, unemployment rate increased an average of 1.65 percentage points more in Southern states than in others. I have no valid explanation for this result; possibly it is the industry mix found in the South.

Inclusion of the regional dummy reduces coefficients and t values for R and W·R substantially. Quantitatively, however, they still tell the same story: Increased rurality worsens unemployment rise, increasingly so, as nonfarm income becomes more important to rural residents. However, the magnitude of coefficients in equations (1) to (3) implies that rurality *per se* has had a very small effect on unemployment increases during the 1974-75 recession. Suppose a state's unemployment rate increased 4.0 percentage points (for example, from 3.0 to 7.0)

during the recession, with five percent rural-farm population. The effect of its being ten percent rural-farm instead of five would be that unemployment rate would have risen into the 4.05 to 4.35 percentage point range instead of 4.0. Thus, "rurality" is estimated to have made a state slightly worse off during the recession. However, when the regional dummy is included (equation 3), net effect of rurality is essentially zero.

The variable more central to this paper is the relative importance of nonfarm income (W). Magnitude of the coefficient of W in equation (1) and W·R in equations (2) and (3) implies that an increase of .1 in W would increase the change in unemployment from about .3 of a percentage point (equation 3) to 1.3 (equation 1). Thus, if state unemployment rate increased 4.0 percentage points, and rural-farm families received .5 of their income from wages and salaries, regression coefficients predict that unemployment rate would have increased in the neighborhood of 4.3 to 5.3 percentage points (instead of 4.0), if W were .6 instead of .5. Even the small .3 effect from equation (3) is statistically significant at the 90 percent confidence level. These results provide some support for hypothesis (3), that employment and income are less stable in an industrialized rural area than in a nonindustrialized rural area.

The regression results do not, of course, tell why states with important off-farm income had larger unemployment increases. Indeed, because of lack of unemployment data pertaining specifically to rural areas of these states, the model is not specified completely enough to be confident that W captures only the effect of rural industrialization on rural areas.⁷

CONCLUSION

Results of the comparisons among pre- and postwar recessions, together with behavior in state unemployment rates in 1974-75, suggest an analytical history of farm-nonfarm economic interaction as follows: Before World War II the main channel of economic influence was through agricultural product markets. Recessions and booms decreased and increased demand for food, which generated unstable farm prices and incomes because of inelastic agricultural supply functions. This is the Schultzman view. This mechanism for instability has become less

⁶This point was brought out by Martin Redfern in his discussion of this paper.

⁷One important phenomenon that current data do not permit proper analysis of is the recent fall in rate of farm population decline and allegations of "return to the land." Whether this is due to improved rural opportunities under rural industrial development, or to improved farm opportunities from the grain export boom, seems impossible to determine at present. However, the fact that the slowdown in farm population decline antedated the recession suggests the slowdown is not simply a response to the business cycle. Indeed, the only recent year in which the U.S. farm population is estimated to have increased from the year preceding is 1972 (although this measured increase may have been due to sampling error) [7].

important over time because, as hypothesized above, the supply functions are becoming less cyclically sensitive, and postwar business cycles have been generally mild.

At the same time, there appears to be an increasingly close link between the rural sector and the general economy by means of factor markets. The growing importance of purchased inputs, notably fertilizers, pesticides and machinery, is part of this shift, as are improvements in transportation and communication. Perhaps more fundamental is the increasing human capital intensity of farming and

increased schooling of farm operators. Human capital and its role in farm income and in adjustment to disequilibrium are more recent Schultizian ideas [6]. These developments are associated with efficiency of adjustment to new technological opportunities and to nonfarm work opportunities, which help keep returns to rural labor more closely connected with nonfarm returns. Adjustments to nonfarm opportunities include permanent migration to other areas, commuting longer distances to work by rural non-farm and farm family members, and location of non-agricultural industry in rural areas.

REFERENCES

- [1] Firch, Robert S. "Stability of Farm Income in Stabilizing Economy," *Journal of Farm Economics*, Volume 46, May 1964, pp. 323-340.
- [2] Hathaway, Dale E. "Agriculture in an Unstable Economy Revisited," *Journal of Farm Economics*, Volume 41, August 1959, pp. 487-499.
- [3] Johnson, D. Gale. *World Agriculture in Disarray*, London: St. Martin's Press, 1973.
- [4] Schultz, Theodore W. *Agriculture in an Unstable Economy*, New York: McGraw-Hill, 1973.
- [5] ——. "Agriculture in an Unstable Economy—Revisited," *Journal of the Northeastern Agricultural Economics Council*, Volume 3, October 1974, pp. 1-10.
- [6] ——. "The Value of the Ability to Deal with Disequilibria," *Journal of Economic Literature*, Volume 13, September 1975, pp. 827-846.
- [7] U.S. Department of Commerce, Bureau of the Census. *Current Population Reports: Farm Population*, P-27, Number 45, September 1974.