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THE NEW AGRICULTURAL ECONOMICS */

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It most often happens that when the economist turns policy-maker he must rely more on his general knowledge of the world, and on his own likes and dislikes, than on the specialized knowledge of his own discipline. This apparent inability to appraise economic diseases and policy without appealing to some nonscientific standard external to economics has been nowhere more marked than in problems of agricultural policy. Far too often agricultural economists have been guilty of special pleading both in their recommendations and in their analysis. How this has come about I do not know, but the agricultural economists, as a group, seem to have a much greater tendency to identify the welfare of the entire society with that of one economic class than have any other group of academic economists, unless it be the Marxists.

There have, of course, been notable exceptions. Some of the men who have tried to free agricultural economic analysis from this type of bias have been and are distinguished members of this Association. But by and large they have worked alone, and so far as I know there has not been, until in recent years, a concerted attempt to attack the alleged ailments of agriculture objectively with all the engines of economic knowledge. That such a concerted attempt is at present under way, with its principal inspiration at the University of Chicago, must by now be apparent to all of us.

Unfortunately the nature of this new approach, and the framework of the analysis on which it depends, have too often been obscured by emphasis on positive policy proposals; and it is by their proposals that T. W. Schultz and the economists who have more or less followed his leadership are best known. It is not my intention, however, to devote much time to forward prices, grain-storage programs, compensatory payments, crop insurance, and measures for stimulating the movement of labor out of agriculture. Of much greater potential value than the present output of recommendations is the general method which is being used to produce them.

The general approach of the Schultzians is nothing more than forming hypotheses about the nature of things, and then testing each hypothesis against observations. Eventually a fairly well established collection of hypotheses can come into being and can form an integrated core of theory that begins to explain the group of phenomena being studied.

The Schultzians have used existing theory to formulate the criteria for desirable performance of the agricultural economy and to construct measures of the extent to which performance goals are realized. They have then compared actual performance statistically with performance goals. Where their measures have suggested that the agricultural economy is not behaving as well as it might, they have worked more deeply into the matter, in search of causes of failure and possible remedies.

Desirable performance is defined in terms of the efficiency with which the national product is produced and the equity with which it is distributed. In their studies of efficiency in production the Schultzians have been concerned primarily with "technological" efficiency, that is, with that allocation of resources which will produce the greatest total output among products.

*/ Condensation of paper read at Flagstaff. The paper is published in full in Journal of Farm Economics, November, 1952.

Efficiency in production is thought of as being achieved when the marginal value product of each factor in every employment is equal to its price. This is "the resource problem".

From comparison of rates of return, a major research task of the Schultziens, they have concluded that:

1. The marginal value product of labor is lower in agriculture than in industry, and
2. The marginal efficiency of capital is higher in agriculture than in industry.

With these "facts" established to their satisfaction they have next turned to an examination of possible causes of the disparities in the rates of return between agriculture and industry and within agriculture.

From these studies of agricultural labor they conclude that there is an excess supply of labor in agriculture which is potentially just as productive as that in industry. As a result, they envisage a continued need for movement of labor out of farming and into other occupations. This can best be brought about by differential wages between the two parts of the economy. That it is not being brought about with sufficient rapidity is demonstrated by the continuing differences in marginal productivity.

Now what of the relatively high marginal efficiency of capital in agriculture? The Schultziens find that this arises because of the almost universal presence of "capital rationing" in agriculture, which in turn is caused by the uncertainty of expectations. Their writings are replete with statistics illustrating the relatively greater amplitude of price fluctuations in agriculture than in industry, and occasionally they also display comparisons of income fluctuations. Uncertain expectations, coupled with relatively inflexible production plans, make farmers reluctant to invest more funds and lenders reluctant to make larger loans. The resulting undercapitalization of agriculture further reduces the marginal value product of labor.

This is the heart of the analysis which springs from examination of employment of the factors. The other welfare criterion, equity in distribution of income, has been but little explored. There is a strong egalitarian flavor to the Schultziens' notion of equity, but the standards to be used immediately are expressed merely in terms of minimums.

I must apologize for injustices which the preceding brief summary does to the Schultziens' system. But it will serve to put before us the main lines of the analysis.

But can we really trust this impressive creation? Just how firm are the joints, how strong are the girders? There is only one way to find out, and that is to test it, every step of the way, empirical finding by empirical finding, and theoretical inference by theoretical inference. When a rotten timber is found it must be replaced with a sound one, when a poor joint is uncovered, it must be cut out and a search made for a better one. If this can be done, not once but over and over again, there is a good chance that we may end up with a new edifice, but it will be one we can trust to stand.

Let me suggest some of the lines this investigation should take. Let us look first at the foundations. The Schultziens' criterion of technological efficiency is written in terms of marginal value product. Now this is certainly appropriate if the economy being studied is operating under conditions of full employment. But suppose it is running along somewhat below this ideal level, as it was, of course, when many of the statistics in the Schultziens' studies were being made? Is it then as important to have more efficient allocation of employed resources as it is to have a reduction in the quantity of unemployed resources? Failure to give a proper

place in the analysis to the difference between welfare goals under full and less than full employment is a serious defect in the underpinnings of the entire construction. Also lacking is any clear standard of dynamic efficiency, or of the efficiency of the process by which equilibrium is reached.

Once we are satisfied that the foundation is reasonably sound, it would next be well to consider how firmly the entire construction is anchored to it. The Schultsian analysis offers four kinds of evidence as to the marginal productivity of farm labor:

1. Comparison, between agriculture and industry, of the ratio of total output to the total number of persons in the labor force.
2. Comparison of the marginal productivity of farm and nonfarm labor and capital at average output as derived from production functions of the Cobb-Douglas type.
3. Comparison of labor income in agriculture and in industry.
4. Examination of migration from rural to urban employment.

Of these four groups of evidence, the first can be discarded as in fact irrelevant.

Marginal costs derived from statistical production functions appear to be more impressive evidence. But even if debate over the precise meaning of the Cobb-Douglas functions is ignored, existing studies are disappointing. Let us look at some of them.

Johnson fitted a linear equation to the logarithms of average value added, value of land and buildings, and man years of labor of 9 output groups in 4 census subdivisions.^{1/} From the production function fitted to these 36 observations he concluded that the marginal productivity of labor was \$390 per man year. But identification of land and buildings with capital, and failure to take into account other inputs, must shake our confidence in his findings.

Two other studies cited by Schultz are not more useful. Heady, using a random sample of 738 Iowa farms computed production functions for 12 different subgroups and for all farms in the sample.^{2/} Labor inputs were reported in man months. In not one of the 13 multiple regressions did he find significant correlation between labor inputs and total output. Inasmuch as labor must certainly have some effect on output, one can only conclude that either the labor input data was defective or that it was highly correlated with other inputs. This amounts to excluding labor from the production function, and must make suspect the coefficients of all other inputs. A similar study by Tintner and Brownlee of 468 record-keeping farms in Iowa seems to show marginal productivity of labor to be about equal to the average farm wage, but the sample on which the study is based was not random even for Iowa.^{3/}

Comparison of wages paid for comparable jobs in and out of agriculture might be a clue as to the marginal productivity of labor in the two employments if we could adjust for the differences in purchasing power and for differing non-monetary rewards in the country and in the city. Labor's average money income seems unquestionably to be lower in agriculture than in industry, although the amount by which it is lower cannot be determined accurately.

^{1/} D. G. Johnson, Forward Prices for Agriculture, (Chicago, 1947), pp. 105-06.

^{2/} E. O. Heady, "Production Functions from a Random Sample of Farms," Journal of Farm Economics, November 1946, pp. 989-1004.

^{3/} G. Tintner and O. H. Brownlee, "Production Functions Derived from Farm Records," Journal of Farm Economics, August 1944, pp. 566-71

Until greatly improved estimates can be made of the returns to the factors in agriculture, and these in real terms, and until labor income can be related to the kinds of jobs done, rather than to the people doing them, comparisons of farm and nonfarm wages will be on uncertain ground.

The fourth kind of evidence on productivity of labor, migration from farm to urban residence, is of quite a different character. Statistics showing place of residence are undoubtedly better than statistics of income. There has undoubtedly been a continuing net movement of people from farm to urban residences. But the very magnitude of the migration away from farms, and onto farms, is just the behavior which would be expected in a dynamic economy, and may be taken as evidence that the equilibrating forces are operating efficiently. It does not necessarily indicate great disparities in labor productivity.

We are left with no very firm grounds on which to appraise the efficiency of employment in agriculture. There may very well be a surplus of labor in agriculture, the marginal productivity of farm labor may be too low, but so far the statistical evidence is not entirely convincing.

When we turn our attention to the marginal efficiency of capital, similar difficulties are encountered. Johnson's estimate of the marginal productivity of capital in agriculture, 12 percent, is little more than a calculation of the average rate of return to land and buildings in one year at current estimates of value of real estate. It is probably an overestimate if, as appears from published information, it takes no account of other capital inputs. It certainly is not marginal efficiency of capital, because it takes no account of expectations.

The argument having to do with capital rationing--uneconomically sparing application of capital--is similarly incomplete. The phenomenon described is undoubtedly present in agriculture, even if one is inclined to take exception to the term. But it is also present in most other economic activities. The question is not whether the supply of capital limits the farm firm's efficiency, but whether it limits farm more than it limits other firms.

The foregoing is enough to suggest the need for further empirical testing of the Schultzian structure. It by no means treats of all the points where testing is necessary. The degree of variability of farm income, the flexibility of the farm enterprise, the relation between farm and urban birth rates, the potential productivity of farm laborers, the elasticity of demand for farm products: all these are matters on which much more research is needed.