Proceedings of Workshop on:

AGRICULTURAL AND RURAL DATA

Series B

May 4-6, 1977

Jointly Sponsored by:

Economic Statistics Committee, American Agricultural Economics Association

Statistical Reporting Service, USDA

Economic Research Service, USDA

Agricultural Marketing Service, USDA

Series B

PREFACE

To overcome obsolescence of data, a series of papers dealing with the conceptual and operational foundations of major data systems was commissioned by the Economic Statistics Committee of the American Agricultural Economics Association in conjunction with the Statistical Reporting Service, Economic Research Service and Agricultural Marketing Service of the U.S. Department of Agriculture. These papers were presented and discussed extensively at an Agricultural and Rural Data Workshop held in Washington, D.C., May 4-6, 1977.

Papers were subsequently revised and are being published in the two Series in which they were organized. Papers prepared by teams in Series B (Gaylord Worden, leader) on Indicators of Economic Well-being of People Engaged in Farming, and Data for Farm and Rural Employment are contained in this publication.1/ Papers prepared by teams in Series A (W.E. Kibler, leader) on Price Reporting, and the Capacity of the Food and Fiber Systems are contained in a separate publication.2/

The papers deserve much study--they were carefully prepared by professionals highly qualified to deal with the conceptual and operational issues in data systems where series data gaps and obsolescence are prominent. The papers will be little more than an academic exercise unless recommendations are used by administrators and policymakers to improve the respective data systems which they address. Many of the recommendations can be implemented with little or no additional resources. In cases where additional funds are required, it is the teams' judgments that the additional resources required will provide benefits to users in excess of costs.

Luther Tweeten, Chairman
Economic Statistics Committee

1/ Single copies of the Series B papers are available upon request from U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Publications Services, Washington, D.C. 20250, or phone (202) 447-7255.

2/ Single copies of the Series A papers are available upon request from W.E. Kibler, Deputy Administrator, Statistics, USDA, Washington, D.C. 20250, or phone (202) 447-2707.

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Series B

A SHORT HISTORY OF THE FEDERAL AGRICULTURAL DATA SYSTEM

by
David Brewster*

My job is to ease the Workshop's participants into their considerations with some comments on the development of the federal government's agricultural statistics. The subject is complex--too vast to be covered entirely in a brief paper and too intricate to be analyzed thoroughly by an historian ill-versed in economics and statistics. Luckily, aspects of the topic have been dealt with extensively elsewhere (33, 42, 43, 50). And with the forthcoming appearance of the AAEA-sponsored publication on data developments since World War II, we shall have a good picture of agricultural statistics down to the present (53). Rather than retreading ground that has already been covered admirably, I intend here a more selective review concentrating on some of the forces that have shaped the system. Many of these (and nearly all of those touched upon in the following account) have originated outside the system itself--not surprising, since agricultural statistics have rarely been collected for their own sake.

Most commonly, they have been assembled as aids to commerce or instruments of government policy. Put in very general terms, the first of these factors--what we might call the mercantile use of data--led to the creation of the system in the 19th century. And the second has assumed growing importance in the present century.

I

Interest in American agriculture is as old as the country, and some figures on the subject go back nearly as far. But for this paper's purpose, what I have in mind by the federal agricultural data system is the body of statistics that began to be assembled about the time of the 1840 census. The 1830's had been a time of national pride, growing social awareness, and, after 1837, economic depression. Reviewing the country's condition for Congress in early December 1838, Martin Van Buren suggested enlarging the upcoming census to include inquiries on what he termed "the great interests specially instructed to or necessarily affected by the legislation of Congress." (25, p. 1714) Van Buren's recommendation led to an ambitious expansion of the census that signaled the beginning of a concerted effort

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to turn the count into something more than an enumeration of population.1/ Among the new questions were thirty-seven concerning agriculture, most of them dealing with quantities of production.

The 1840 returns provided benchmarks for the annual farm production estimates that Henry L. Ellsworth, Commissioner of Patents, started publishing in 1842, using what remained of a $1,000 appropriation he had secured three years earlier for agricultural purposes. The Patent Office estimates continued through most of the forties,2/ but died at decade's close, and for more than ten years after, the government issued no similar data except that contained in the census reports.

Demand for timely statistical information grew during this period, however, especially in the nation's agricultural press and state agricultural societies. In 1862, Orange Judd, editor of the American Agriculturist, undertook an extraordinary effort to issue monthly crop reports in his journal. Five appeared covering May through September, based on material supplied by volunteers. A month before Judd published his first report, Abraham Lincoln signed the bill creating the U. S. Department of Agriculture. The new agency, which was responsible for collecting and disseminating agricultural statistics, drew so heavily on Judd's ideas that its first statistician, Lewis Bullman, gave the editor credit for providing "definite shape to a plan for the annual collection of statistics of the crops. . . ." (46, p. 589)

In 1863, USDA formed a separate statistical division and began issuing its own crop reports. Three years later, the Department's statistical work passed into the hands of Jacob R. Dodge, a former teacher and journalist. As USDA's senior statistician, he did more than any other individual to mold the federal agricultural data system throughout the remainder of the 19th century.

During an absence from the Department, Dodge supervised the collection of agricultural data for the 1880 census, the first to include inquiries on acreage planted in specific crops. Returning to his old job as chief statistician in 1881, he continued with USDA until 1893. The last annual statistical compilation that Jacob Dodge issued was more than twice as long as the first. By the time he retired, the number of census inquiries relating to agriculture had multiplied to over a thousand.3/

The expansion of the federal agricultural data system that this represented paralleled roughly the emergence of commercial farming outside the old South. Congress's first appropriation for the collection of agricultural statistics came in the same decade as the invention of the steel plow and the

1/ The proposal for an expanded census was discussed at some length in (29).
2/ The estimates did not appear in 1846 clue to a lack of appropriations.
3/ The 19th century agricultural schedules are reprinted in (57, pp. 238-78). See also (57, pp. 99-106).

reaper. And the most sustained period of growth in 19th century agricultural statistics began almost simultaneously with the agricultural revolution inaugurated by the Civil War. Cheap land, rapid mechanization, improved transportation, and new methods of food preservation combined with expanding markets to give farming a new dimension. The amount of land in farms doubled between 1850 and 1890 when the frontier was declared closed; by 1898 wheat production had peaked at more than seven times the 1850 figure (35, pp. 457, 512).

During this period of commercialization, the process by which commodity prices were established underwent fundamental change. Railroads and the marine engine facilitated rapid movement of goods; telegraph lines and cables made possible instantaneous exchange of information. Shortly after midcentury, these developments enabled the creation of a continental price for wheat and, by the mid-1870's, a world price. As markets developed on a regional, national and world-wide scale, the distance between farmer and consumer increased. The need arose for greater information about supplies and markets. Orange Judd described the situation this way, using wheat as his example:

> Shrewd speculators, who have on hand a large stock of old grain, often circulate newspaper reports to the effect that owing to bad weather, insects, small breadth, etc., there will not be half a crop gathered. On the other hand, as the harvest begins, another class intending to become grain buyers, are interested in magnifying the yield for the purpose of depressing prices. Thus, not only the producers, but many dealers themselves, are in a state of doubt and uncertainty. . . . In short, there is such an entire absence of reliable statistics that all are in a state of doubt and uncertainty. . . .(2, p. 72)

It was primarily to correct this condition that federal agricultural statistics came into being in the late 19th century. They were published in a belief that supply and demand would inexorably balance if producers, consumers, and middlemen were sufficiently aware of the factors affecting their economic fates. This conviction carried a corollary that supply was the principal variable determining price. Thus, the 19th century data system covered numerous topics sparingly, a few more generously, but it dwelled lovingly on production.

"These annual statistics will, it is hoped, guard against monopoly or an exorbitant price," said Henry Ellsworth introducing the federal government's first set of yearly production figures in 1842 (52, p. 4). Ellsworth's sentiment became the touchstone of the men who had chief responsibility during the next sixty years for the government's agricultural data system. The Department's first crop report, issued in July 1863, opened with a discussion of the dangers accruing when ignorance of supply and demand allowed speculation to flourish (44, pp. 1-3). Jacob Dodge declared flatly that USDA's crop estimates aimed at "foiling the purposes of reckless speculation." (45, Flyleaf) And John Hyde, the Department's chief statistician from 1897 to 1903, summed up the philosophy behind the 19th century data system when he wrote:

> What honest producers and interested consumers desire is relations which shall be of mutual benefit, and in the promotion of those relations the Division of Statistics of the Department has not only directly benefited agriculture to an incalculable extent, but, in so doing this, has incidentally benefited all legitimate occupations and all consumers (48, 1897, p. 261).

The idea that informed individuals could deal effectively with the vagaries of the marketplace lived on to inspire some of the major developments in the 20th century agricultural arena. Clearly, if monthly or annual production data were good, current estimates would be better--hence the creation in 1915 of market news reports. Better still would be actual forecasts. As early as 1889, Jacob Dodge had said the pressing need of the day was for crop forecasts (47, 1889, pp. 201-02). Shortly after 1910, Nat Murray, Acting Chief of the Statistical Bureau, prevailed on the Secretary of Agriculture to permit translation of crop condition reports into production forecasts.4/ Intention to plant surveys followed in 1923,5/ the same year as the first Agricultural Outlook Conference.

The art of forecasting in itself created a need for new data. Prices, fertilizer use, wage rates and other factors of production came increasingly under the scrutiny of statistical inquiry.

Thus, a continuum extends from the Patent Office's statistical compilation of 1842 to the Outlook Conference more than 80 years later. Throughout the intervening period ran a common theme that individuals, given sufficient information, would make rational decisions leading to economic stability. Acting out of this conviction, the government began to publish agricultural statistics before 1900. The Outlook Conference, however, was a sign that by the 1920's, statistics alone were no longer considered adequate. A new belief had arisen that data required analysis to be transformed into useful information, and, also, that thorough analysis would require still more data. In this way, the 19th century agricultural statistical system merged with a new discipline, agricultural economics.

II

Officially, the main purpose of the 19th century system was to secure a fair price for the farmer and, hence, a fair cost to the consumer. Yet, the material was obviously also useful to merchants and traders. And in reading accounts of agricultural data in the late 19th century, one is impressed by the lively interest the National Board of Trade took in the figures that the Department of Agriculture published (50, pp. 38-43).

4/ Years later, Murray recalled having proposed production forecasts in 1912. Forecasts for wheat, oats, barley and rye appeared in 1911, however, and it seems likely that Murray misremembered the exact date (26, pp. 715-16; 41, p. 11).

5/ A previous intention to plant survey had been undertaken in 1917 in response to a request from the military. See (13, pp. 729-30).

Farmers more than once complained that the numbers benefited merchants more than producers--to which the standard reply was that merchants had other sources for the same data, but farmers had only the government.6/

Whatever the merits of the charge, it did raise a question about the government's proper role in the affairs of business and the people. The issue was by no means new, nor was it restricted to agriculture. But it took on added urgency as the United States made the transition into the 20th century, and its resolution held implications for the agricultural data system.

The advance into the new century brought profound social and economic changes that were not accommodated easily. America's urban population leaped threefold between 1870 and 1900, fed by a flood of immigrants (35, pp. 11-12). Depression struck the country in 1873 and again in 1893. A series of violent conflicts that became legend in labor history exploded across the land--the Strike of 1877, Haymarket in '86, Homestead in '92, and Pullman in '94. Surveying the scene in 1896, Frederick Jackson Turner, a foremost American historian of the day, offered a terse evaluation: "The nation," he wrote, "seems like a witch's kettle." (34, p. 297)

The principal source of organized discontent during these thirty years was not America's cities, however. It was her countryside. The Granger Movement of the 1870's gave way to the Farmers' Alliance of the eighties, and then, in the early nineties, to the major reform movement of the time--Populism. At the heart of agrarian dissatisfaction was the bitter realization that agriculture's technological revolution had brought the farmer not prosperity, but its reverse. Prices paid producers marched downward grimly between 1870 and 1897: wheat from $1.04 a bushel to $.81, corn from $.52 to $.26; and in New York, the market price of cotton fell from 17 cents a pound to 6.7/ "We were told two years ago to go to work and raise a big crop, that was all we needed," declared one protester.

> We went to work and plowed and planted; the rains fell, the sun shown, nature smiled, and we raised the big crop that they told us to; and what came of it? Eight cent corn, ten cent oats, two cent beef and no price at all for butter and eggs--that's what came of it. Then the politicians said that we suffered from over-production.8/

Politicians were not alone in thinking that over-production was the problem. But the theory carried a harsh implication that farmers, by their very industry, had brought about their own troubles. It was not popular in rural regions. Casting for alternative explanations, agrarian dissidents hit on aspects of the emerging industrial age: blame lay with the railroad and elevator owners, with trusts and monopolies, with tight credit and

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6/ This attitude continued into the 20th century. See (32, pp. 701-02)
7/ Prices paid to producers are as of December 1 (40, pp. 5, 32-3, 75)
8/ Quoted in (21, p. 57).

eastern money. "It is a struggle between the robbers and the robbed," declared a Kansas reformer, Sockless Jerry Simpson.9/

Given this belief, the 19th century agricultural data system and its underlying philosophy of individual action must have seemed thin gruel indeed. Statistics, buttressed by a kind of rough equilibrium theory, were scant use to producers who believed their markets were manipulated by forces beyond their control. What emerged from the agrarian discontent was not a cry for numbers, but a demand that government control business and that the people control government.

It amounted to a call for a more active, interventionist federal role, and the country at large was not yet ready to respond. Gradually returning prosperity in the late 1890's helped quiet the storm. But a more fundamental reason for the agrarian failure lay in the transfer of political power at the federal level from farm to nonfarm interests. The Census of 1860 had revealed for the first time that a minority of the work force claimed agriculture as its occupation (18, p. 420). By 1900, the situation was such that agrarian proposals had little chance of enactment unless they somehow struck a responsive urban chord.

That happened shortly after the turn of the century. Theodore Roosevelt's presidency from 1901 to 1909 began yet another period of reform, this one lasting until about World War I. Unlike its agrarian predecessors, the new movement drew much of its strength from the cities and from a fairly prosperous set of citizens. Encompassing both political parties, it was the reform movement of Roosevelt, Taft and Wilson, as well as Jane Addams, John Dewey and Walter Lippmann. The very name by which it came to be known--Progressivism--had a ring of sturdy respectability. Yet in several respects the Progressives of the 20th century shared common ground with the agrarian dissidents of the 19th: they saw a need to define a new role for government, and many of them strongly distrusted the middlemen of the marketplace.

A number of regulatory measures were signed into law between 1900 and World War I. Some, such as the Livestock Slaughter Act of 1906, gave birth to important new agricultural data series. But probably the most significant data developments, were brought on by a phenomenon of the period involving food prices.

Shortly after 1900, agricultural surpluses, which for years had depressed farm profits, began drying up. Globally, a sharp advance took place in price levels, especially the cost of living. Yet agricultural production did not expand accordingly. Replying to charges that they were extorting the consumer, farmers said, first of all, that their own costs had risen sharply and, secondly, that they did not control prices, nor did they set marketing and

9/ Quoted in (22, p. 64).

distribution costs. While acknowledging that consumers were paying dearly, many farmers claimed that their own returns scarcely justified the expenditure of capital and labor. The money, they claimed, was being soaked up by the cost of getting products from the field to the table (24, pp. 111-12).

Similar complaints had been heard from agriculture for years. Now, however, the rural protests were augmented by a chorus from the urban power centers. The result was a new interest in agriculture, especially marketing, and a growing realization that the available data were not adequate to explain the situation. It would be too much to say that a truly systematic response developed, but agricultural data did begin to expand cautiously in several directions. Statistics on production costs increased. The Department of Agriculture commenced collecting annual data on farm wages; the first survey of labor supplies appeared. A statistical investigation of farm credit--probably the earliest undertaken by the federal government--was published in 1912. A USDA survey of price spreads was published in 1911. And Congress, having requested marketing studies several times previously, finally ordered the creation of an Office of Markets within the Department in 1913.

Among the most persistent requests the Department's Statistical Bureau received were those for up-to-date data on the prices farmers received for their products (26, p. 713). The Bureau began compiling such material in 1908, and two years later complemented its prices received series with a survey of the prices that farmers paid for the goods they used in production and family living. These two dates, 1908 and 1910, marked the birth of elements that would eventually be combined in the price parity formula. As such, they were important years not just in the history of agricultural data, but also in the history of social statistics.

By way of recapitulation, we can say that, broadly speaking, two sets of influences had shaped agricultural data by the eve of World War I. The predominant one--the demand for information enabling individuals and businesses to make wise economic decisions--had led to publication of production figures in the 19th century. Subsequently, it would help inspire the collection of data necessary for forecasting work.

The second set of influences, produced by the country's growing industrialization, distilled into a call for a larger governmental role in the life of the nation. Roosevelt's Country Life Commission, established in 1908,was an early sign of a new federal interest in rural conditions. And the legislation of the prewar years revealed the government gradually, in a relatively limited way, intruding deeper into agricultural matters. Nineteen-fourteen saw passage of the Smith-Lever Act and the Cotton Futures Act. These were followed in 1916 by the Warehouse Act, the Grain Standards Act, and the Federal Farm Loan Act. Permanent development of an activist agricultural policy was some years off. But these measures pointed the way, and with them came a modest increase in data.

III

World War I forced Washington suddenly into the agricultural sector--setting wheat and hog prices, regulating the fertilizer industry, and carrying on other activities designed to ensure adequate food supplies at home and abroad (5, pp. 88-91). The experience, though brief, put novel strains on the data system and exposed several problems. In 1919, Leon Estabrook, Chief of the Bureau of Crop Estimates, outlined some of the needed improvements that the War had brought to light. These included detailed consumption and supply statistics for the U.S. and other nations; intention to plant surveys; county crop and livestock estimates; separate figures on commercial production and reserve stocks kept on farms; crop estimates for a wider variety of commodities; substantially expanded livestock figures; and additional crop and livestock data for foreign countries. Estabrook also noted a growing interest in so-called "special phases of agriculture"--such topics as income, hours of hired labor employed, binder twine and seed requirements, the number of tractors and silos on farms (49, 1919, pp. 7-11).

This evaluation of the data system appeared as twenty years of agricultural prosperity reached their peak. Buoyed by price supports and foreign markets, production stretched to its limits during World War I. The acreage of wheat harvested for grain rose from 56 million to over 73 million between 1914 and 1919, hog values more than doubled, and in 1919 cotton sold for the highest price it had ever commanded (35, pp. 511, 519, 517). Then, almost abruptly in summer of 1920, the spiral broke. Government supports disappeared and overseas markets contracted, driving farm prices down into the depression of the twenties. Ominously, the cost of items that farmers purchased continued relatively high. As conditions worsened, letters flowed into Washington detailing the hardships of the nation's agricultural regions. "This fall not only will I lose my home and everything in it," wrote one Southern farmer, "but hundreds, perhaps thousands, will be in my condition, homeless."10/ He was, as he suspected, far from alone.

Demand for federal relief was prompt and sustained. Congress appointed a joint commission of inquiry in 1921; the President called a national agricultural conference the following year (37, 38). Both bodies declared the need for a well-considered agricultural policy, and both agreed on the inadequacy of existing data. In the words of the Congressional report, "The statistics now available are neither sufficiently accurate, comprehensive, nor current, nor are they established upon a sufficiently definite and uniform basis to be completely comparable from year to year over a long period." (37, part 1, p. 22)

10/ Quoted in (17, p. 3)

Warren G. Harding, in 1921, had named as his Agriculture Secretary Henry C. Wallace, editor of Wallace's Farmer and a man with a keen appreciation of the economic underpinnings of the farmer's plight. Wallace combined the Department's economic and statistical work into a single agency, the Bureau of Agricultural Economics, placing it under the direction of one of the most prestigious agricultural economists of the day, Hency C. Taylor (6, pp. 53-4). As the BAE came to life, pressures increased on the government to reconsider its traditional self-help attitude toward agriculture and, by implication, the adequacy of the data system which had reflected that attitude. Recalling the period years later, Taylor worte:

> The distress of the farmers in the 1920's, at a time when those in city occupations were as a rule amazingly prosperous, caused more and more people to become skeptical of the view that, with full information for all, the supply-demand equilibrium price would be a fair price for farm products--a view which had held sway for 80 odd years in official circles in the United States. (33, p. 509)

The high cost of living had fired popular discontent during the prewar administrations and channeled much of the Department's economic work into marketing studies. Marketing continued to receive attention during the twenties, but the collapse of farm prices and land values excited interest in broader aspects of economics, allowing the BAE to undertake a wider range of investigations. The President of the American Farm Economics Association made the point in 1925 when he commented that, "To no small degree the present stimulus in economic research is an outgrowth of the public demand for an agricultural policy based on the results of scientific economic inquiry." (56, p. 13)

As public demand for a new agricultural policy stimulated economic research, so indirectly it also contributed to statistical growth. In 1924, the Secretary of Agriculture reported an expansion of the Department's statistical and market news services in response to data needs created by program developments (47, 1924, pp. 27-8). The next year, Congress passed the Purnell Act authorizing funds for experiment station research into economic and social problems. And a decade after the founding of the BAE, a speaker summarized the previous ten years to members of the AFEA and the American Statistical Association: "Since the establishment of the Bureau of Agricultural Economics, statistical work in agriculture has grown enormously both in scope and in refinement." (7, p. 460)

This period witnessed the real beginning of the federal government's attempt to analyze current conditions in agriculture, much of it in connection with outlook work. Data on credit increased, as did figures on taxes, marketing, cooperatives and farm income. The census of 1920 was the first to use farm residence as a classification, opening the way for expanded farm population investigations. Among the significant trends during the twenties was the growing use of index numbers. Some of these numbers developed by George F. Warren showed the ratio of prices received to prices

paid,11/ and beginning in 1922, Department of Agriculture statisticians published a current index in Weather, Crops and Markets indicating the purchasing power of farm goods.

Even in the early years after introduction of the purchasing power concept some economists looked askance at this index--though not always just in terms of its analytical merit. John D. Black, Harvard University's well-known agricultural economist, was staggered that President Hoover allowed the BAE to continue issuing parity ratios as the farm depression of the twenties sank into the Great Depression of the thirties. "Why he ever let that get by has never been adequately explained," Black marvelled. "Maybe it was because he was a mining engineer." (9, p. 53)

Despite agriculture's serious problems after 1920, a program for relief did not develop quickly. The official policy during most of the succeeding decade amounted to what one economist later called "assisted laissez faire." (20, p. 639) President Coolidge's Secretary of Agriculture, William M. Jardine, captured the mood with this statement in his 1925 Report: "It is the traditional policy of our Government to foster agriculture as the most essential of our industries, but without in anywise seeking to dominate or direct it." (48, p. 18) The Outlook program, initiated in 1923, new farm credit legislation, and the removal of legal obstacles to farmer cooperatives were the chief policy developments prior to the Agricultural Marketing Act of 1929.

The Marketing Act gave birth to the Federal Farm Board, which was charged with promoting commodity sales through cooperatives and was also authorized to make direct purchases via stabilization corporations. This legislation was conceived in the belief that marketing improvements could salvage U. S. agriculture. It echoed Henry Ellsworth and Jacob Dodge, declaring a policy against speculation and in support of a better distribution system. 12/ Thus, the law set forth traditional goals. But in giving the Farm Board the power to buy goods on the open market, the Marketing Act tried to achieve its goals in a way that was without peacetime precedent. The Board drew heavily on USDA for data concerning land utilization, credit, insurance, crop and price conditions, the foreign agricultural situation and market prospects. Yet ultimately it failed to cope with the growing flood of surpluses, and it left as part of its legacy a plea for production controls (16, pp. 3-6). President Roosevelt's incoming administration listened, a new farm program appeared, and as a result the need for additional statistics increased still more.

The years between World War I and the New Deal had seen a major expansion of the data system in response to the clamor for a solution to the farm depression. A new policy was not immediately forthcoming, but by the beginning of Franklin Roosevelt's first term, a foundation had been prepared, and the reputation of agricultural statistics was clearly on the rise. Howard Tolley, Mordecai Ezekiel, and Louis Bean, all of them agricultural economists, had made significant contributions to statistical

11/ Warren's ratios showed the relationship of prices received to the wholesale price index (54, p. 56).
12/ 46 Stat. 11, sec. 1.

theory with their work on correlation analysis. 13/ Broad areas of statistical inquiry had been established, and a set of concepts had emerged to be used in gauging the condition of the agricultural sector.

IV

Probably the most famous of the concepts was the one that had caused John Black's amazement at President Hoover: parity. It was written into law as an objective of the 1933 Agricultural Adjustment Act, despite the uneasiness it caused some analysts.

One of the things about parity, for example, that bothered Murray Benedict of the Giannini Foundation was the assumption that a single measurement could reflect accurately the economic health of all the nation's farmers. What Benedict wanted were more precise tools that would differentiate between specific groups, each made up of producers with similar characteristics. "We have too long used the expression 'the farmer' as though there were some representative individual who personified this group," he told an audience in December 1933. "The marked contrast in the characteristics, interests, and condition of the negro [sic] farmer and of the highly capitalized, often well-educated farmer of the corn belt will be sufficient to illustrate the point." (7, p. 465)

We can discern here a fragment of the dissatisfaction with "average" farm figures that eventually led Benedict and others to propose an economic classification of farms, predecessor of today's system of sales classes (8, pp. 694-708).

Here also is a refrain that would become common during the next twenty-five years of data discussions: the need for increasingly detailed agricultural statistics. Benedict's complaint was actually a somewhat unusual variation. More often than not, the demand for detailed statistics translated into a call for additional data at the county level. Largely a response to the deepening federal involvement in agriculture, it dated back at least to World War I. 14/ It grew strident during the New Deal. So great was the government's need for data by 1940 that it led Theodore Schultz to comment that administrative considerations usually decided which statistics would be collected. "it is clear," he said, "that the influence of the administrator's point of view has not become less with the rise of the Big Action programs." (30, p. 62)

Production policy illustrated the point. The old federal policy in this area had conceived of farmers making voluntary adjustments in light of their own self-interest, and it had stressed the importance of accurate estimates of total farm output. But after 1933, when policy shifted toward land planning, quotas, and acreage allotments, administrators discovered

13/ For a brief discussion of this work and citations to the relevant publications, see (33, pp. 456-9).

14/ See, for example, (49, 1917, p. 13).

that they could implement county adjustment programs only if they had data at fairly specific geographic levels.

Similarly, creation of the Farm Credit Administration in 1933 increased the usefulness of geographically specific information on income and credit. Already, by 1935, strains on the data base had led one state worker to say that agricultural economics' continued good standing as a social science might well depend on strengthening its statistical side (12, p. 668).

World War II intensified even more the need for accurate, detailed statistics. Discussing the problem in 1943, Claude Wickard, then Secretary of Agriculture, wrote:

> The mass of information which had been developed enabled the Department to enter into its World War II programs with a reasonably precise picture of agricultural plant capacity and its production possibilities. While far from perfect, the statistics served to direct the allocation of food and other agricultural products to civilian, armed forces, and lend-lease needs. Facts of agricultural supply needed to be known, however, in greater detail than before, and also with the greatest possible promptness. There was danger that time lost in gathering facts would mean time lost in crop planting. If a shortage of any food existed, it was important to know in time for action to refill the bins and barrels. If there was a surplus, it was important to develop waste-prevention measures. (47, 1943, p. 227)

Demand for local data, though probably the major motif during the thirties and forties, was not the only one. Food consumption statistics, for example, drew increasing attention during both decades, first in connection with the New Deal programs, later as a part of the War effort. The market basket concept appeared in the thirties. The Balance Sheet of Agriculture was first published in the early forties, followed by new market bill data later in the decade. Additionally, during the thirties, farm income statistics underwent developments culminating in the appearance in 1940 of the first Farm Income Situation Report.

Despite the growth of the statistical system, there were signs of trouble. "Fact is," said O.V. Wells, head of the BAE, "it seems our ability to talk theory or write abstract formulae is clearly outrunning our desires or ability to measure or find ways of checking." (55, p. 858) Wells' observation appeared in 1950, and a year later, the BAE badly misestimated the national cotton crop (36, pp. vii, 4-9).

"Cotton is dynamite," Tama Jim Wilson is supposed to have exclaimed of this important Southern crop when Nat Murray approached him in 1911 with the idea of issuing commodity forecasts (26, 715-16).15/ It was not the least significant lesson Wilson learned in 16 years as Secretary of Agriculture, and it was still true 40 years later. The 1951 cotton estimate reportedly cost producers $125 million. It also launched a Congressional investigation, which

15/ See also footnote 4.

resulted mainly in a strong recommendation that the BAE form a research unit to find ways of improving its numbers (36, pp. 10, 31-2).

While the Bureau was still attempting to improve its crop estimates, its farm employment figures came under criticism (4, pp. 976-87). Finally, in 1955, the American Farm Economic Association appointed a committee under the direction of Walter Ebling, Wisconsin's State Statistician, to conduct a thorough investigation into the agricultural data situation. The Ebling Committee issued a report in 1957 which, though unpublished, circulated in the Department of Agriculture and the Census Bureau and also became the subject of a presentation to the House Subcommittee on Agricultural Appropriations. It led to a request for the Department to propose a plan for improving the agency's statistical program. USDA presented its recommendations at the 1958 appropriation hearings (39, p. 886).

The Ebling Report was one of the important documents on data to appear during the fifties, especially since it could claim the imprimatur of the major association of agricultural economists. Yet it did not emphasize the need for new types of statistics or new statistical concepts. Rather, its most striking feature was the importance it attached to more timely, accurate and complete reporting of traditional data, especially at the local level. The principal statistical problem the Report identified stemmed from "modern requirements" that stressed "more and more the need for detailed facts for local areas such as counties and townships." The Report said:

> Actually this often may mean a detailed breakdown by counties of estimates already made nationally or by states, thus bringing the state and local work up to the level already attained nationally. Having data available by counties or township helps facilitate national agricultural policy which has become basic to the welfare of farm people. (3, p. 1)

What were the "modern requirements" the Report's author had in mind? Four were listed:

(a) the increase in national agricultural programs such as Price Supports, Soil Bank, Rural Program Projection, Rural Development, etc.

(b) the increasing emphasis on agricultural marketing activities by government agencies, farmers and farm product processors.

(c) continuation of the "cost-price" squeeze and tendency to over-produce in agriculture.

(d) improved techniques of research and analysis of agricultural problems. (3, p. 2)

The plan for data development that USDA submitted to the House Subcommittee also divided into fourths, each with its own goal. These were: (1) to provide more and better county, state and national data; (2) to strengthen price statistics; (3) to speed up the release and distribution of reports;

and (4) to provide data at county, state and national levels on a wider range of topics (39, pp. 389-94).

The importance that Ebling and his associates attached to local data reflected priorities that had emerged in response to government programs during and after the New Deal. But a full understanding of the Committee's position should probably also give consideration to several additional factors. Following President Eisenhower's 1953 inauguration, Peyton Stapp, a Budget Bureau official involved with the federal statistical program, made a presentation before the AFEA's annual meeting. Part of his statement was conventional enough:

> Let me. . . say categorically that we are not opposed to State individuality and are sympathetic to the idea of a State getting data for analysis on its own problems.

But part of what he said had a somewhat different ring:

> We insist, however, that the object of the system is a good national set of estimates, and from the Federal Government's point of view, State differences and State needs should not be allowed to jeopardize this objective. We believe the BAE has been too tolerant of State idiosyncrasies but under our prodding steps are being taken for better coordination of State procedures. (31, p. 870)

Within three months, the BAE was gone, abolished in a USDA reorganization. Within another three months, Sinclair Weeks, Secretary of Commerce, had a report on his desk that included a proposal to substitute less expensive sample censuses and surveys for the quinquennial agricultural census, which was a main source of local data. As the committee submitting the report conceded, the recommendation was not in accordance with predominant opinion. Nor would the new approach "provide the county totals so strongly urged by several important groups. . . ." (51, pp. 5, 32)

These occurrences were unconnected,but they followed rapidly after each other early in a new Presidential administration. In retrospect they seem to have indicated, if not an attack on the federal data system, then at least a skepticism about the tendencies it had shown in the previous two decades. The year after Stapp's address, the AFEA responded with a session on data, stressing heavily the importance of local statistics (10, pp. 1226-52). A similar session followed at the next annual meeting (11, pp. 1030-59). And the Ebling Report itself was above all else an emphatic reply to any uncertainties about the need for traditional kinds of data at the county and township level.

While this defense was being mounted, however, changes were underway that would raise a whole new set of questions about the data system. Many of the developments were part of what Wayne Rasmussen has called the second American agricultural revolution--a surge in technological, scientific, and managerial advances that followed World War II and sent productivity soaring

while farm numbers dwindled (27, pp. 578-91). This revolution was, if anything, more profound than the one brought on by the Civil War. It affected not just the means of production and marketing, but the very organization of those activities.

Also following the close of World War II, the technical skills and tools of agricultural economists improved markedly. In 1950, for instance, only one department of agricultural economics used linear programming in its research projects. None taught it. By 1960, however, almost all employed the technique, and most made some effort to teach it to their students. Significantly, one limitation facing researchers who employed linear programming was an absence of sufficient input-output data (14, p. 930; 15, p. 304). Advancing computer technology dramatically increased the economist's ability to use quantities of detailed statistics; no longer was it necessary to average large numbers of variables, thus sacrificing their individual identities. But the ability was of scant use without the necessary data.

In 1958, the Ebling Committee appointed a subcommittee to investigate data problems facing researchers. The subcommittee in turn prepared a set of papers for presentation at the AFEA's next meeting, assigning the leade-off address to Philip M. Raup. Raup took as his theme structural change in agriculture and its effect on data demands. His general argument was that forces operating mainly outside the level of the firm had revealed substantial inadequacies in existing statistics. At one point, he said in partial summary:

> It is becoming increasingly difficult to give a succinct answer to the question: "What is agriculture?" We have already seen how the concept of the farm in agriculture is blurring and losing analytical usefulness, in the form which our present statistics report it. We have observed too that data on the ownership unit in agriculture are not simple [sic] blurring, they are practically speaking non-existent. In a broader sense, the entire concept of "agriculture" is losing distinction. The business of supplying inputs to agriculture is being sliced away from the corpus of the farm unit, and increasingly identified as a non-farm business activity. Processing, transport, handling and other functions once a part of agriculture have been defined out of the field and taken over by the non-farm sector. We have only the foggiest notions about the extent of total economic activity devoted to the provision and distribution of our supplies of food and fiber products. (28, p. 1488)

These observations are significantly different from those appearing in the Ebling Report but they are similar to the ones heard today. During the ten years following Raup's discussion, his topic--structural change and agricultural data--lived on to cause additional concern, as did many of the specific problems he examined. One result was the appearance in 1972 of yet another report on data, this one prepared by the American Agricultural Economics Association (the AFEA renamed). The 1972 Report has been widely circulated and its indictment of contemporary agricultural statistics is

well known. Its message is much the same as Raup's: "With each passing year, fundamental structural change transforms agriculture and rural life. Thus theoretical concepts around which we have constructed our data systems grow progressively more obsolete." (1, p. 868)

Complaints about inadequate data have been common recently throughout the economics profession. Wassily Leontief went so far in 1970 as to say that agricultural economists were better off than most of their colleagues (23, p. 5). The AAEA Data Committee hastened to correct him in its Report (1, p. 867). But the observer is still left with the impression that, however gloomy the statistical picture may be in the food and fiber industry, it is not particularly bright outside of it either. Even the British economist, F. H. Hahn, a past president of the Econometric Society, is on record declaring that there is something scandalous about the number of people today refining analyses with no empirical foundations. "To discuss and analyze how the economy works," he has told his colleagues, "it may be necessary to go and look." (19, p. 1)

To the outsider, therefore, it seems that agricultural economists today are dealing with one aspect of a very large problem. It seems also that the fundamental causes of their statistical difficulties may stretch across the boundaries of their subdiscipline.

V

Over the years, the agricultural data system has reacted to a variety of influences, some of which I would like to highlight here in closing.

Periods that have seen substantial expansions of the system have frequently also witnessed national calamities such as wars and economic depressions. Modern agricultural statistics in the United States were born at the end of the depression of the 1830's. They grew during the Civil War. In the present century, they have grown still more in response to both World Wars, the farm depression of the twenties and the Great Depression of the thirties.

Since the 19th century, the system from time to time has also reflected general social concerns extending beyond the agricultural sector. Census inquiries on tenure, for example, appeared at the end of the 19th century, at the same time that a broad based interest in landownership patterns was emerging in urban as well as rural circles. As we saw earlier, the growth in data after the turn of the century likewise drew much of its inspiration from nonagricultural sources.

The needs of those who use statistics have been important considerations over the years. In this respect, we should not overlook the obvious: a major influence on the federal data system has been the federal government, itself one of the biggest users of statistics. The system that emerged in the 19th century reflected the free trade attitude that officially held sway at the time. The subsequent development of agricultural statistics has paralleled the emergence of a more activist federal policy.

One conclusion that can be drawn with fair certainty is that discontent among agricultural economists over their data will likely continue. It has been a normal theme during the last 100 years, varying in intensity, but usually present. Approaching the end of his long career as the Department of Agriculture's chief statistician, Jacob Dodge summed up the predicament of his art with words that have been timely ever since: " A stream can not rise higher than its source; pure mathematics and immaculate judgment combined can not cure the inaccuracy of erroneous original data. This is to-day the supreme difficulty in obtaining correct statistical results. . . ." (47, 1892, p. 405)

LITERATURE CITED

(1) The AAEA Committee on Economic Statistics. "Our Obsolete Data Systems: New Directions and Opportunities." American Journal of Agricultural Economics, 54, December 1972.

(2) American Agriculturist, March 1862.

(3) American Farm Economic Association. "Report of the Data Committee to the United States Department of Agriculture and Census Bureau, Department of Commerce." n.d. (Mimeographed). Copy in files of the History Group, U. S. Department of Agriculture.

(4) American Farm Economic Association Committee on Farm Employment Estimates. "Report." Journal of Farm Economics, 35, December 1953.

(5) Baker, Gladys et al. Century of Service: The First 100 Years of the United States Department of Agriculture. Washington, 1963.

(6) Baker, Gladys L. and Wayne D. Rasmussen. "Economic Research in the Department of Agriculture: A Historical Perspective." Agricultural Economics Research, 27, July-October 1975.

(7) Benedict, Murray R. "Agricultural Statistics Viewed in Light of a Changing Agricultural Program." Journal of Farm Economics, 16, July 1934.

(8) _____ et al. "Need for a New Classification of Farms." Journal of Farm Economics, 26, November 1944.

(9) Black, John D. Parity, Parity, Parity. Cambridge, 1942.

(10) Crosby, James E., Jr. "Agricultural Data" [papers presented before the American Farm Economic Association]. Journal of Farm Economics, 36, December 1954.

(11) _____. "Providing More Adequate Agricultural Data" [papers presented before the American Farm Economic Association]. Journal of Farm Economics, 37, December 1955.

(12) Ebling, Walter H. "The Field of Agricultural Data." Journal of Farm Economics, 17, November 1935.

(13) _____. "Why the Government Entered the Field of Crop Reporting and Forecasting." Journal of Farm Economics, 21, November 1939.

(14) Eisgruber, Ludwig. "Managerial Information and Decision Systems in the U.S.A.: Historical Development, Current Status, and Major Issues." American Journal of Agricultural Economics, 55, December 1973.

(15) _____ and Erwin Reisch. "A Note on the Application of Linear Programming by Agricultural Economics Departments of Land Grant Colleges." Journal of Farm Economics, 43, May 1961.

(16) Federal Farm Board. Recommendations for Legislation. Special Report to Congress. Washington, 1932.

(17) Fite, Gilbert C. George N. Peek and the Fight for Farm Parity. Norman, 1954.

(18) Gates, Paul W. The Farmer's Age: Agriculture, 1815-1860. New York, 1960.

(19) Hahn, F. H. "Some Adjustment Problems." Econometrica, 38, January 1970.

(20) Hardin, Charles M. "The Bureau of Agricultural Economics Under Fire: A Study in Valuation Conflicts." Journal of Farm Economics, 38, August 1946.

(21) Hicks, John D. The Populist Revolt: A History of the Farmers' Alliance and the People's Party. Minneapolis, 1931. Bison Book Edition, 1961.

(22) Hofstader, Richard. The Age of Reform: From Bryan to F.D.R. New York, 1955.

(23) Leontief, Wassily. "Theoretical Assumptions and Nonobserved Facts." American Economic Review, 61, March 1971.

(24) Malin, James C. "The Background of the First Bills to Establish a Bureau of Markets, 1911-12." Agricultural History, 6, July 1932.

(25) Messages and Papers of the Presidents. Compiled by James D. Richardson. Vol. 4. New York, 1887.

(26) Murray, Nat C. "A Close-Up View of the Development of Agricultural Statistics from 1900 to 1920." Journal of Farm Economics, 21, November 1939.

(27) Rasmussen, Wayne D. "The Impact of Technological Change on American Agriculture, 1862-1962." Journal of Economic History, 22, December 1962.

(28) Raup, Philip M. "Structural Changes in Agriculture and Research Needs." Journal of Farm Economics, 41, December 1959.

(29) Russell, Archibald. Principles of Statistical Inquiry as Illustrated in Proposals for Uniting an Examination into the Resources of the United States with the Census to be Taken in 1840. New York, 1839.

(30) Schultz, Theodore W. "Needed Additions to the Theoretical Equipment of an Agricultural Economist." Journal of Farm Economics, 22, February 1940.

(31) Stapp, Peyton. "How the Office of Statistical Standards Can Help Develop a Program." Journal of Farm Economics, 35, December 1953.

(32) Taylor, Henry C. "A Century of Agricultural Statistics." Journal of Farm Economics, 21, November 1939.

(33) _____ and Anne Dewees Taylor. The Story of Agricultural Economics in the United States, 1840-1932. Ames, 1952.

(34) Turner, Frederick Jackson. "The Problem of the American West." Atlantic Monthly, September 1896.

(35) U. S. Bureau of the Census. Historical Statistics of the United States, Colonial Times to 1970. Bicentennial Edition. Part 1. Washington, 1975.

(36) U. S. Congress. House. Crop Estimating and Reporting Services of the Department of Agriculture: Report and Recommendations of a Special Subcommittee. 82nd Cong., 2nd sess., 1952.

(37) _____. Report of the Joint Commission of Agricultural Inquiry. 4 parts. Report no. 408, 67th Cong., 1st sess., 1921.

(38) _____. Report of the National Agricultural Conference. Document no. 195, 67th Cong., 2nd sess., 1922.

(39) _____. Committee on Appropriations. Department of Agriculture Appropriations for 1958: Hearings Before the Subcommittee on Department of Agriculture and Related Agencies Appropriations. Part 2. 85th Cong., 1st sess., 1957.

(40) U. S. Department of Agriculture. Agricultural Statistics, 1936.

(41) _____. Crop Reporter, 13, June 1911.

(42) _____. Major Statistical Series of the U.S. Department of Agriculture: How They are Constructed and Used. 9 vols. Agriculture Handbook no. 118, 1957.

(43) _____. Major Statistical Series of the U. S. Department of Agriculture: How They are Constructed and Used. 11 vols. Agriculture Handbook no. 365, various dates.

(44) _____. Monthly Crop Report, May-June 1863.

(45) _____. Monthly Report, 1866.

(46) _____. Report of the Commissioner, 1863.

(47) _____. Report of the Secretary, 1889, 1892, 1924, 1943.

(48) _____. Yearbook, 1897, 1925.

(49) _____. Bureau of Crop Estimates. Report of the Chief, 1917, 1919.

(50) U. S. Department of Agriculture. Statistical Reporting Service. The Story of U. S. Agricultural Estimates. Miscellaneous Publication no. 1088, 1969.

(51) U. S. Department of Commerce. Appraisal of Census Programs: Report of the Intensive Review Committee to the Secretary of Commerce. Washington, 1954.

(52) U. S. Patent Office. Report from the Commissioner, 1841.

(53) Upchurch, M. L. "Developments in Agricultural Economic Data," forthcoming.

(54) Warren, G. F. Prices of Farm Products in the United States. U. S. Department of Agriculture Bulletin no. 999, 1921.

(55) Wells, Oris V. "Agricultural Statistics as an Aid to Research, Service, and Administration." Journal of Farm Economics, 32, November 1950.

(56) Wilson, M. L. "The Source Material of Economic Research and Points of View in its Organization." Journal of Farm Economics, 8, January 1926.

(57) Wright, Carroll D. The History and Growth of the United States Census. Washington, 1900.

EMPLOYMENT DATA FOR RURAL DEVELOPMENT RESEARCH AND POLICY

by
Clark Edwards, Conrad Fritsch, Sigurd Nilsen,
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Summary

Rural-oriented users of employment data have expressed concern about data gaps. This is a summary of a report describing available rural and nonmetropolitan employment data series. The series are evaluated for their usefulness in meeting descriptive, analytic, and prescriptive needs. Several sources of data gaps are examined: (1) desired data which are not being supplied, (2) desired analytic units which differ from available reporting units, (3) desired time or place detail which is not supplied, (4) available series which are unreliable or inaccurate, (5) operational definitions used by data suppliers which are not the same as the conceptual definitions employed by data users, and (6) data supplying institutions which fail to respond to changing program monitoring needs and changing research methods.

Some data gaps can be narrowed at nominal cost simply by making small changes in collection and distribution methods. Other gaps are considered formidable--resolutions may not be cost-effective so we may have to learn to live with them. Listed below are some of the key recommendations discussed in the paper.

1. Much useful data is collected which is not made available to rural-oriented users. A geographic bias exists which obscures rural data while publishing national summaries and summaries of densely populated, urban places. If detail needs to be suppressed because of disclosure rules, excessive volume, or scanty observations, rural area data are omitted. Some simple retabulations of existing census data could solve this problem. For example, the considerable employment data currently made available by size of firm for 4-digit SIC codes for metropolitan areas could also be published in a single table using the same stubs, but reporting detail for all the nonmetropolitan counties. Further geographic detail could be supported by the existing data system for the nonmetropolitan parts of census regions and divisions and of States.

2. Some data which suppliers are perfectly willing and able to share with clients are not used because they are relatively inaccessible. As one example, the administrative data collected at county levels by State Employment Security

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agencies should be centrally coordinated to be more readily accessible to policy staff, researchers, and program analysts. The marginal cost of special requests is often prohibitively high, as is the cost of editing and interpreting special data tapes. These data would be employed more extensively if they were released in a user-oriented format. If the marginal cost to the user were lower, the volume of use would be considerably higher.

3. Sample data such as the Current Population Survey (CPS) were initially intended to sense the pulse of the nation. Subnational detail has been found to be far more reliable for metropolitan than for nonmetropolitan areas. The emphasis on expanding the regional reliability of the sample is at the State level. Publication of reliable sample statistics for the third of the population living outside metropolitan places should be considered. To maintain overall sample consistency and minimize costs, this effort should be coordinated with the redesign of the sample after the 1980 Census of Population.

4. The rural point of view is often not presented in meetings where changes in census, sample, and administrative data are discussed. Sometimes a data gap can be closed simply by slightly changing the way a question is worded on a questionnaire, the stratification of a sample, or the sorting and merging underlying the publication of a table. Relatively large gains can be had at nominal cost if the rural point of view is expressed at the appropriate moment in the planning process. Rural employment data users should become more actively involved with the development of rural-based data series. To achieve this end, representation of persons with rural interests should be expanded on Federal data committees.

5. Linkages are seldom supplied among reporting households and establishments, among geographic regions, or among time periods. This lack of linkage limits the usefulness of employment data for policy and research needs. Complete linkage is prohibited by considerations of both cost and privacy. But public use samples which contain such linkages would increase the value of existing data without incurring large costs or violating privacy considerations.

6. Several data gaps occur because of the way the present data system is conceptualized. Alternative conceptualizations come slowly and involve considerable interaction between policy makers, data suppliers, and researchers. Several reconceptualizations are discussed in the paper. One refers to the limitation of the product-market-orientation of the Standard Industrial Classification (SIC) codes. Employment is a factor market concept as are land and capital. There is often more variation in employment attributes within a SIC code than there is among them. An alternative set of factor-market-oriented codes is required which groups industries not by the similarity of outputs, but by the similarity of inputs. The development of an input-based industrial coding system is needed in order to monitor and analyze employment relative to capital, land, technology, water, energy, and the environment.

7. Users are often at a loss as to how to access the myriad of employment data now collected. More guides are needed, such as handbooks, data-oriented sections in professional journals, and user reports of data gaps encountered in program monitoring and research. The appendix appearing in the full paper is one example of a user guide. Such handbooks should be periodically updated with reliable and useful information.

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The information base used in rural development research and policy is not adequate [3, 4, 6, 13, 17]. 1/ Social problems, and the expectation that programs can be developed to deal with these problems, create the need for a data base. This is so even though it sometimes appears that data are desired for the sake of filling econometric models, or even as ends in themselves. Data users' growing concerns about data obsolescence reflect a belief that the gap between data needs and availability is widening.

This paper examines the role of data in meeting descriptive, analytic, and prescriptive needs. It identifies and assesses possible reasons for data obsolescence, and explores the widening gap between existing supplies of data and changing rural data needs. The focus of the study is on employment data used for rural development research and policy. However, the problem which this paper addresses arises with other types of--and uses for--data.

Rural development problems are many faceted and, therefore, not easily described. These problems include relatively lower average incomes than urban residents, more intense poverty, and relatively limited access to economic opportunities and community services.

Reduced labor requirements in the agricultural sector contributed to rural outmigration from the end of World War II into the 1970's. A decline in farm population of about 50 percent between 1960 and 1977 was directly associated with emigration of farmers and their families, and indirectly associated with emigration of persons whose nonfarm rural jobs depended on local agriculture. Economic opportunities unrelated to agriculture were also limited in rural areas. For many persons, their best chance seemed to be a move, generally to an urban labor market. However, during the 1960's, there was an increase in rural manufacturing employment, especially in the Southern States [5, 8, 9]. This was followed by gains in rural employment in the trades, services, and government during the 1970's [16]. Nonfarm employment currently provides the major source of earnings for over nine-tenths of the rural labor force. This

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1/ Italicized, underscored numbers in parentheses refer to references listed at the end of this report.

change has been accompanied by population increases in the majority of rural counties during the 1970's [1, 2].

In recent years, unemployment rates in rural areas have generally been lower than in urban areas. These figures provide an optimistic profile of rural employment conditions. However, if business conditions deteriorate, rural workers drop out of the labor force more quickly than urban workers. Many are not eligible for unemployment compensation and, therefore, are not directly counted in administrative unemployment statistics. A greater proportion of rural than urban residents are self-employed, and the extent of underemployment and underutilization of these workers is not reflected in unemployment measures. The unemployment figures do not reflect the incidence of lower labor-force participation. And they hide the existence of large pockets of rural underemployment. Moreover, these figures often mask problems of various subgroups--such as women, teenagers, the elderly, and racial and ethnic minority groups--when they are released only in aggregate form for rural areas. There are no reliable indicators of hidden unemployment in rural areas.

The pace of economic development varies among regions, so regional employment data are needed. Energy production in some Western States is creating new job opportunities, but it is accompanied by heavy demands on local governmental institutions to supply education, housing, and other community needs. In the South, communities which experienced increased employment in manufacturing during the 1960's are now providing increased employment in the trades and related construction and service sectors. Multiple job holding which combines farm with nonfarm employment is becoming popular in many farming areas, such the Midwestern grain-producing areas for example. Public investment in roads and private investment in improved transportation facilities provide some rural residents with additional job opportunities in more distant metropolitan labor markets, although many rural residents continue to relate to a local, rural labor market. Movement of retirees to some rural areas creates new employment demands there, generally in service-related industries. Recent industrialization of agriculture in the Southwest has affected both farm and nonfarm earnings and employment in that region.

Rural areas contain nearly one-third of the U.S. population; relatively few are farmers. Data for monitoring and analyzing rural development problems need to focus on regional variations in nonfarm, nonurban employment. Much of the available data base reflects other viewspoints: national aggregates, agricultural detail, or urban detail.

Survey of Specific Problems

A recent informal survey by the authors identified some specific problems, which require more extensive rural employment data for analysis. The respondents were 25 professionals who are concerned with employment data for rural development research and policy. They identified problems related to industries, occupations, geography, and various economic impact studies, as well as a number of descriptive or measurement studies. These problems are reviewed below to illustrate that improved rural employment data are needed, not for their own sake, but as a means toward meeting important research and policy ends.

Industry-oriented problems were related to labor utilization associated with agriculture, fisheries, forestry, or mining, and to factors affecting variations in wages and earnings. Some studies focused on factors affecting location of nonagricultural industries, rural job creation, and labor productivity. Occupational problems involved economic opportunities for various skill levels, occupational mobility, multiple job holdings, institutional factors affecting employment, (such as unionization), the supply and utilization of volunteer workers; and the presence of illegal alien workers. Geographic problems were concerned with economic opportunities in local commuting or trade areas, with migration among areas, and with describing and explaining rural-urban balance and regional variations in population, income, employment, and the quality of life.

Impact studies reported in the survey included general population, income, and employment models, both static and dynamic, for local economies. Studies were reported which examined impacts on employment from changes in exports, energy costs, natural resource development, institutional provisions, (such as minimum wages and overtime payments), and national business cycles. They examined impacts of local employment changes on income distribution and economic well-being.

Descriptive studies cited in the survey were used to meet program monitoring needs, such as relating county unemployment and wage estimates to Federal fund allocations for manpower programs and unemployment insurance coverage. Descriptive purposes were sometimes the respondent's final end use of employment data. In some cases, the studies were intended eventually for other uses by various policy or research clientele; this was true, for example, for respondents who described employment patterns, income levels, labor force participation rates, and hidden unemployment. Descriptive frameworks included forecasts or projections of employment data.

The common elements throughout these social and economic concerns are that: (1) they are seen by the respondents to be in some sense a part of the rural development problem, and (2) they create a demand for rural employment data. These data are used by the respondents to describe the nature and extent of some aspect of the rural development problem, to analyze and explain why the problem arose and persists, and to prescribe solutions. The responses suggest that rural employment data serve diverse and sometimes conflicting research and policy needs. Work toward these goals by the respondents was frequently hindered because the rural employment data base was found to be inadequate. What these inadequacies were and why they occurred is discussed below.

In what follows, the authors seek: (1) to examine requirements placed on a data system by the demand for data, (2) examine the supplies of rural employment data currently available, (3) to identify gaps in employment data for rural development research and policy, and (4) to suggest possible ways to close some of those data gaps. The examination is confined to rural employment data and excludes statistics when a series does not extend to rural labor markets. The authors exclude analysis of the supply of, and demand for, other data needed to cope with rural development problems--for example, those which measure population, income, and the quality of rural life. However, some of the analyses of rural employment data will provide insights into urban employment data gaps as well as those in rural data apart from employment.

Sources of Data Gaps

A data gap is present when a user believes that the available data system does not supply the needs it should. The sources of gaps are summarized here and will be discussed in more detail in subsequent sections. Obsolescence has been cited as an important contributor to gaps in agricultural data systems [4]; however, in rural employment data, other causes were found to be more important.

Appropriate and useful data series are provided for many employment concepts, but the problem for the rural development data user is that the local, rural detail required is generally not available. For some concepts, such as underemployment, data gaps are present because no appropriate or useful series is provided. In addition, there are some instances of obsolescence (such as the concept that the primary earner in a household is the male head of the family) where the series provided were reasonably appropriate and useful at the time they were initiated, but are now less so because of changing situations.

Divergence between available and desired units, such as when data are available by establishment but are desired by household, is an important cause of gaps in rural employment data. Some of these gaps are unavoidable. For example, it would be prohibitively expensive to seek to close a data gap which arose because a user wanted to compare, for each worker in a rural area, the characteristics of the household (from the population census) with the characteristics of the place of employment (from the economic census). Permanent gaps are imbedded in the data system as a simple consequence of a divergence among: (1) units of observation (such as households), (2) units used by statistical agencies to report data (such as counties), and (3) units required by the user for analytic purposes (such as rural communities). Other gaps due to divergence between units could be overcome, such as reconciling a series which includes military households with a series which excludes them.

Gaps associated with inadequate time detail involve limited time series and failure to report seasonal variations. The absence of histories of observational units limits efforts to describe or explain how characteristics in one period influence behavior in a subsequent one. Gaps associated with inadequate place detail are particularly acute when the focus of research or programs is on local, rural areas. The term rural is a geographic concept; more geographically specific detail than is available is generally needed for rural development studies.

Lack of statistical reliability presents a problem when a user finds, for example: (1) that a national sample fails to provide sufficiently accurate estimates of the Nation's rural population characteristics, (2) that economic characteristics have been imputed by the census to the small rural firms which were not surveyed, or (3) that data tapes contain errors because of inappropriate or careless editing procedures.

Inadequate conceptualization of variables being reported and compromising operational definitions are causes for data gaps; these can usually be corrected as soon as they are understood by both users and suppliers. Communication difficulties between users and suppliers permit correctable data gaps to continue longer than is necessary. Users and suppliers often have different

interests--some want national data and others want regional; some want rural data and other want urban. It is impossible for one data system to meet all conceivable needs. The specific purposes for which some supplier institutions were originally created differ from the purposes which currently motivate researchers and program managers.

The following sections expand on the issues raised and demonstrate that there are some inherent conflicts between data supplies and data demands that are bound to result in continuing data gaps. Several data gaps are identified that may easily be rectifiable, and some that may be alleviated at nominal cost.

Obsolescence

Obsolescence implies a change in what is wanted. Data systems become obsolete because needs change, not because the systems no longer supply the information originally intended. Recent increased interest in rural development reflects a change in the nature of social concerns from those of primary concern a decade or more ago. Changing focus for Federal, State, and local policy can make existing data systems obsolete, since the changes generate new demands for data.

The social view that economic growth is a cure for economic problems is changing. This includes changing viewpoints toward the comparative advantages of rural and urban lifestyles. Emphasis in research is shifting away from private toward social costs and benefits. Recent legislation for rural areas emphasizes nonfarm instead of farm activities, and new programs are being implemented. Both program monitoring and research analysis needs change as social values change, and existing data systems become obsolete. For example, rural employment data often has been considered synonomous with farm employment data. Now rural nonfarm jobs have expanded and are seen as a basis for rural growth. Earlier rural data sources which focused on farm employment do not fill current needs.

Changing institutional arrangements influence decisions on what resources to allocate to rural development, how to finance the allocation, and how program benefits are distributed. A rural area may, for example, have development problems because of a failure of the market system to deliver public goods and services. Earlier data systems, which emphasized institutions which deliver only private goods, are becoming obsolete.

Changing social explanations of problems introduce new concepts and new relationships to be measured. Extensions of economic theory to include time and place as explanatory variables lead to changing needs for longitudinal and geographic detail. Theoretical distinctions between private and public goods create demands for different data classifications and for the study of different analytic units. For example, analytic units of traditional economic theory have been firms and households for microeconomics and national aggregates for macroeconomics. Rural development theory points to other units reflecting different institutional aggregates, such as state and local governments, and different geographic aggregates, such as functional economic trading areas or labor markets. Data must be available for these units in addition to data used for traditional micro and macro units.

Changes in the way analysts describe and analyze problems contribute to data obsolescence. Changing a technique from simple budgeting to complex modeling requires extensive data changes. Improved computer hardware and continuing changes in software add to the ease with which analysts can utilize large quantities of data, and add to the demand for increased detail. Relatively aggregative measures which fail to report subnational detail, or on cross-tabulations of relevant population characteristics, do not meet the needs of researchers or policy analysts concerned with local area development problems.

The above discussion supports the view that obsolescence can cause data gaps for rural development research and policy analysis. Much of the changed need has been met by turning away from agriculturally-oriented data sources, such as provided by USDA and the Agricultural Census, toward what have heretofore been considered urban-oriented data sources, such as the Economic Censuses, the Population and Housing Census, and the Current Population Survey. These sources were not specifically designed to meet the needs of persons interested in rural employment problems. It is probably not useful to call these sources obsolete. Instead, many employment data gaps may be seen as a legacy of past urban and agricultural orientations, and of failure of researchers and programs to address the nonagricultural problems of rural areas. Subsequent sections address such data gaps in the nonagricultural data sources.

Data Set Attributes

Attributes of a data set (such as the year represented) are distinguished in this paper from the variables measured within the set (such as the number of persons employed). Attributes which contribute to data gaps include the grouping of observations into units, time and place detail, and statistical reliability. Data gaps which result from inappropriate attributes are a major source of difficulty for users of rural development employment data. Some of these gaps are uncorrectable, or can be corrected only with a major redesign of the series.

Units--Social and economic characteristics describe individual people. In principle, a complete enumeration for the United States should contain 220 million records, one describing each person [12]. Subsorts of such records could then show family units, market firm associations, nonmarket institutional associations, and/or geographic aggregations. These individual records can include characteristics of each of the institutions with which they are associated. Linkages between subsets could be traced through individual records to show household characteristics of employees in a specific industry. Linkages over time--to show job changes, migration, and family formation--could be traced through individual histories.

Such a thorough data system is not only politically infeasible, given prevailing attitudes toward privacy, it is prohibitively expensive. The economizing principle suggests we need to allocate scarce data-collecting resources among alternative data needs. In the interests of economy in meeting specific data needs, individuals may be sampled. Whether sampled or completely enumerated, further economies are achieved when records of individuals are aggregated at the point of observation into institutional groupings, such as households or firms.

This report distinguishes among three concepts used to group individuals. Individuals are grouped into observational units, such as firms or households, from which data are collected. Observational units are further grouped or aggregated into reporting units, such as industrial classifications or geographic areas, which are used by the statistical agency to report data to users. Further aggregation is into the analytic units performed by the data user, such as grouping several counties into a multicounty unit, or grouping 4-digit industries into 2-digit units. It is possible for all three of these units to be identical, but they generally will be different. Observational units are frequently determined by cost of collection considerations, reporting units are frequently determined by historical precedent and by government regulations and requirements, including disclosure rules, and analytic units are determined by the needs of researchers and program managers.

Conflicts over units can directly result in data gaps. For example, the characteristics of a farm family will appear in the population census and the characteristics of the farm in the agricultural census with no linkages to relate family characteristics to farm characteristics. Further, data gaps can indirectly result because information obtained from observational units is lost in the reporting or analytic units through the aggregation process.

Conflicts between data needs and data supplies--and inevitable data gaps--are inherent in the need for privacy and in the working of the economizing principle. The conflicts are built into the data system with the aggregation of individuals into observational, reporting, and analytic units. Unless the reporting units conform to user requirements, the usefulness of the data will be limited.

Data collected from observational units by supplier agencies are provided for several basic types of reporting units which have proven suitable from certain, but not all, supplier and user viewpoints. First, individuals are aggregated into families, households, or dwelling units reflecting place of residence. Data are reported by place of residence, for example, by the decennial Census of Population and Housing, and by the monthly Current Population Survey. Some data users find little conflict inherent in these reporting units. Users who study problems such as unemployment, underemployment, labor force participation, family income distribution, intensity of poverty, or multiple jobholding depend on this type of reporting unit, although difficulties arise when different series use different operational definitions of a household.

Second, individuals are aggregated into establishments of firms reflecting place of work. This is done for the Economic Censuses and the Bureau of Labor Statistics establishment data. Data users depend on this type of reporting unit who study problems such as: impacts of energy availability, minimum wages, basic exports, or business cycles on employment; union activities; or employment requirements by industry. Minor difficulties are encountered when a user compares different series using slightly different definitions of an establishment. More severe data gaps arise when users see a need to relate place of work data to place of residence data.

Interpretation of firm and household data often assumes that markets establish prices and quantities for certain economic data. When the reporting unit acts outside the market through nonmarket institutions, special situations

arise which can lead to data gaps. Nonmarket institutions (such as churches, foundations, and government) are such reporting units. Sometimes household income is not derived through ordinary markets; for example, some may be received through transfer payments or home grown food. Observation units which deliver public goods (such as health or education services) through nonmarket arrangements may purchase inputs (such as labor and materials) in the market. And units which acquire inputs from nonmarket arrangements (such as volunteer labor) may deliver products which have a measurable market value (such as meals for the elderly). Difficulties in handling these nonmarket relationships lead to certain data gaps. Consider two cases--first, where labor is valued in the market but the product is not; and second, where the product is valued in the market but labor is not. In the first case (for example, supplying a government service), there is no conceptual problem in reporting the number of persons employed and their payrolls. For these purposes, the reporting units are comparable to establishments. However, measures of productivity from these data, if such measures exist, are not comparable to productivity measures for market firms for which value-added measures are provided. In the second case (for example, using volunteer labor), the employment data problem is in under-reporting; volunteer workers generally are not counted as in the labor force.

Researchers and program managers interested in subjects for which data are regularly reported, and finding one (and only one) type of reporting unit useful, are not likely to be concerned with major data gaps arising from reporting unit conflicts. But a number of rural development problems may be dealt with only by using data which cross over two or more of these units, and there often are no linkages between them. For example, establishment data provide information on the number of jobs in a county by place of work, but household data provide occupational information by place of residence. A lack of linkages between firm and household reporting units which are necessary to address a given labor supply and demand problem results in a data gap.

Data users studying the delivery of public goods, such as educational services, will be confronted with data gaps built into the data system if linkages are not provided among the family institutions which supply labor, the market establishments which hire labor, and the nonmarket, or government institutions, which train the labor. Data users studying impacts of natural resource development will be confronted with data gaps built into the data system if linkages are not reported between the market firms which use the resource and the nonmarket or government institution which regulates the use of the resource. Data users studying local trade and labor market transactions will be confronted with gaps if linkages are not reported in the various series on public hospitals, schools, and other nonmarket institutions which hire labor and sell final products.

Time--Data sets vary with respect to the time an observation is taken and the interval of time between observations. The economizing principle requires allocation of scarce data collecting resources over alternative data needs, and results in decisions to supply some series on a monthly basis, such as the unemployment rate, some on a quarterly basis, such as the income and product accounts, some on an annual basis, such as County Business Patterns, some on a quinquennial basis, such as the Census of Manufactures, and some on a decennial basis, such as the Census of Population has been.

Efficient use of data collection resources results in purposive staggering of observations. Yet, this makes comparisons among sources tenuous. For example, consider the temporal problems in making comparisons of 1972 Economic Census information with 1970 Census of Population information. Moreover, few linkages are provided over time within a given series. For example, the occupation of workers in a rural area in 1970 is known. Also, from the 1970 census, the occupation for 1965 is known and can be compared with the occupation in 1970. This is a cost-effective solution to one specific instance, but it fails to solve the general problem of linkage to extensive cross-sectional data already available for an earlier period, 1960.

Program monitoring and research analysis needs vary with respect to appropriate descriptive time intervals. Monitoring unemployment insurance programs might require monthly data, while analysis of rural employment trends relative to national business cycles, or industries with large seasonal variations, might call for a quarterly series. Until 1977, the Economic Censuses, with the exception of the Census of Manufactures, have collected data only for a mid-March survey week. Such data do not measure seasonal employment changes in the resort and recreation industries, which currently are experiencing growth in rural areas. The 1977 Censuses of Retail Trade, Wholesale Trade, and Service Industries will include, as does the Census of Manufactures, questions on the number of employees for the pay period including the 12th of March, May, August, and November.

When the temporal units used by the data suppliers fail to match those preferred or required by users, or when links across time periods required for tracing individual histories longitudinally are not collected and reported, data gaps arise.

Place--Regional variations in economic activity are of paramount importance in rural development research and program monitoring. Most of the employment data reported in the Economic Censuses have as their purpose estimates of the national situation or the situation in large metropolitan areas. Until 1977, detail for rural areas from these censuses was frequently either not collected or, if collected, not released in a form useful to rural-oriented users.

Employment data in the 1977 Censuses of Retail Trade, Wholesale Trade, and Service Industries will be published for each county, for each city of 2,500 or more inhabitants, and for the balance of a county which has reportable cities. The limitations imposed by the lack of physical location addresses for business establishments located in rural areas make further detail segmentation of the balance of the county impractical. This added step toward geographic disaggregation of the employment data would be useful; however, it continues to suffer from loss of detail by industry and size class due to disclosure problems. Geographic aggregation to rural parts of States, or to rural parts of multistate regions, would allow for presentation of needed information.

Data sets vary with respect to geographic aggregation. Observational and reporting units are frequently aggregated into geographic units prior to release by statistical agencies. For example, the family characteristics from the Census of Population may be available by county, but detailed cross-tabulations between industry and occupation from the same census are published only

at the national level, with less detailed reports for State levels. Detail is available for States on microfiche. Considerable data are collected which are not readily available to users and are, therefore, never used.

With unlimited data collecting funds, data could be reported almost continuously over space; for example, per city block or per square mile. But limited budgets and privacy considerations require that data be aggregated to larger areal units, such as urban place, county, multicounty area, State, or a metro-nonmetro dichotomy. Data users studying problems such as employment location, commuting patterns, and migration depend on aggregations of family units to areal units. Data users studying problems such as industry location and trade flows depend on aggregation of establishment units to areal units. Data users studying problems such as the availability of health, education, transportation services, and the impacts of public employment depend on aggregation of nonmarket institutional units into areal units.

The areal units by which data are reported are not always consistent among series. For example, the definition of nonmetropolitan areas used in the CPS may not be the same as that used in other series. The CPS is locked into the configuration existing when the sample was redesigned after the 1970 population census. In 1971, the Office of Management and Budget (OMB) designated 482 counties as metropolitan. The CPS used that definition in designing its sample. Since then, OMB has classified more counties as metropolitan. In December 1977, 647 counties were so classified. County Business Patterns and other county-based data sources can be combined and recombined to reflect the changes in population and economic activity implied by the redesignation of a county from nonmetropolitan to metropolitan status. When new classifications are adopted by data suppliers, comparisons with earlier periods become difficult.

Few linkages are established which depict flows of people, capital, products, or information over space within a series. For example, the geographic location where the output of an establishment is produced is reported, but where the output is consumed is not, thus hampering reseach on beyond-local markets for products of the local, rural labor force.

Much of the areal data which is collected is summarized and reported from an urban point of view. Thus, data which would be useful for rural development research and program monitoring are collected, but not readily available. For example, census reports are published in considerable detail for metropolitan areas. But a search for comparable published data for nonmetropolitan data reveals only highly aggregated data for counties. Summaries of greater detail for the nonmetropolitan United States, for nonmetropolitan parts of census regions and census divisions, and for nonmetropolitan parts of States would make these data, which are already collected, more useful to rural-oriented data users. Some users gain access to these data when guarantees of confidentiality are negotiated between the user and the data supplier. Greater availability of public-use sample tapes with appropriate regional code identifiers could be used to overcome many disclosure problems. An alternative procedure to overcome nondisclosure of rural detail is statistical approximation of unpublished information by the data user. This is useful for those areas for which considerable industry detail is reported, but it puts the researcher in the peculiar position of making statistical estimates of data which are residing in census files.

Program monitoring and research analysis needs vary with respect to appropriate levels of area aggregation. Trading and commuting studies and industry location studies may need subcounty units of analysis; program monitoring may be for counties; impacts of natural resource development may require coverage of a watershed including several counties; and studies of effects of unionization may be on a State--or possibly, multicounty labor market--basis. When the areal units used by the data suppliers fail to match those preferred by users, and when flows of people, capital, and goods across areal boundaries are not measured, data gaps arise.

Quality of data--Data sets vary in the quality of information provided. Unreliable data is a source of data gaps.

Complete enumeration provides an approximate count of all individuals and their characteristics. This would appear to guarantee reliability. But a number of difficulties occur, and these tend to give rise to larger data gaps for rural than for urban areas. One difficulty is that not all households or establishments are actually contacted, because they do not meet the requirements to appear in the sample list. Thus, some under-reporting occurs, especially in rural areas with a large proportion of self-employed or low income individuals. What is intended as a complete enumeration turns out, in practice, to be a very large sample. A second difficulty is that some firms fail to respond, so data are imputed to these firms based on administrative records of IRS and SSA and on industry averages. Imputations are also made to the establishments of multiunit firms in those few instances where the administrative records are not on an establishment basis. The multiunits tend to be in metropolitan rather than rural areas.

Small firms whose records are in the administrative files from which sample lists are developed, but which hire relatively few workers and account for relatively little value added, are excused from filing questionnaires on some of the economic censuses. The reason given is that the cost of collecting data from many small firms would be greater than what the slight increase in accuracy of national estimates is worth. Most of the data for these small firms are surrogate reports taken from administrative records, and the rest are imputed from industry averages. The procedures for overcoming difficulties of under-reporting, failure to respond, and gathering data from small firms are acceptable for efficient description of metropolitan and national data. However, data gaps remain for users interested in regional detail, particulary for rural regions where unreported firms and small firms, while not contributing a large volume to dollar sales, may comprise an important proportion of the number of establishments.

A large share of information reported in censuses is not based on questioning the entire population, but is based on a sampling of that population. This results in a situation in which data which appear to the casual user to be from a complete enumeration are, instead, from a sample. An alternative but related technique is to rely on purposive subsets of the total population based on certain characteristics. Multiple-jobholders and establishments selling gasoline are treated by this technique. These techniques are efficient in terms of describing metropolitan areas and the national situation, but the sampling errors and out-of-scope information on the purposive subsets can bias small-area data reports.

Once the census data are collected, whether from an enumeration or a sample, a number of data problems arise through imputations of missing data, use of control totals on sample data collected in the census, and from simple human error. Respondent error in misinterpreting the questions asked; research and program monitor failure to read text material and footnotes which provide information on the limitation of the data; processing errors; fiscal year versus calendar year reporting; inadequacy of respondent records; conceptual problems of classification; and other nonsampling errors also have an impact on the interpretation of the data. Publications and data tapes which contain errors and inconsistencies reduce the quality of the data used by researchers and program monitors.

Sampling in lieu of complete enumeration decreases the monetary costs and time lags between data collection and data availabiity. Sampling may or may not result in reduced precision, but it does limit the functional and geographic detail that can be made available.

The use of list frames to develop samples for collecting worker information on establishment surveys concentrates observations on establishments with known characteristics, and is, thereby, more efficient than data gathered from area surveys. Population lists developed from administrative records, such as income and payroll tax files, may provide a nearly complete list of reporting establishments. A relatively small number of large firms hire most of the workers, so completely enumerating very large firms or sampling relatively large ones at higher rates than small firms further increases the efficiency of the sample. But the lists commonly used, such as income and payroll tax records, usually will not include all of the target population of a rural development study, such as low income households or self-employed workers.

The sampling methods currently in use are efficient and effective in reflecting the activity of large firms and of representative households at the national level and in metropolitan areas. However, these procedures provide less reliable estimates of smaller firms and low income people in rural areas.

Nonmetro areas have special characteristics that make collecting employment and employment-related data more difficult than in metro areas, using current methods of data collection. These problems limit the quality and quantity of data available for researchers and program administrators. Low density of population and firms in most nonmetro areas presents a special problem when data are collected by sample survey. Most sample surveys used by Federal data groups to collect employment data were originally designed for the higher density urban areas. When sampling rates which work in urban areas are applied to low-density areas, the number of observations collected is often too small to yield statistically reliable employment, unemployment, and labor force estimates, even for the nonmetropolitan aggregate as a whole.

With areas of low density, small population, and few firms, the availability of nonmetro employment data is affected in another way. Legal disclosure and confidentiality requirements prohibit Federal data agencies from publishing data which might enable users to identify individuals or firms. The small numbers found in many nonmetro areas frequently mean that data may not be published at the county, State, or multistate level. In sparsely populated rural counties where only one or two firms comprise an entire SIC code, the data are

either suppressed by disclosure rules or aggregated to a higher order of SIC code. This problem is particularly acute in the many rural counties where one or two large manufacturing firms provide most of the nonfarm employment.

Nearly a third of the United States population lives in rural areas. Yet it is difficult to get the national sample of economic characteristics to show what is happening to these people relative to metropolitan residents. Sampling procedures need to be developed to correct for the lack of reliable rural-urban subsorts of national samples of employment data. This can be accomplished to a large extent by expanding rural sampling rates relative to urban ones, up to the point where the added costs are judged to be warranted by the benefits. An expansion of the Current Population Survey (CPS) is required in order to make the existing estimates of nonmetropolitan data more reliable, and to provide estimates of employment and unemployment for the nonmetropolitan sectors of the four census regions. Some expansion in this direction has been initiated recently. Researchers and program managers working in the field of rural development should be members of the statistical committees involved in efforts to bring about such changes.

Operational definitions of variables

Even if data series are relevant to current problems (not obsolete), and if there are no conflicts arising from difficulties with units, time, place, or quality, data gaps can still arise. Examined below are gaps which arise through conflicts in the conceptualization and measurement of variables. A data series sometimes does not measure what it purports to measure. Data sets which differ in attributes with respect to units, time, or place may lead to different operational definitions of the same concept. A given concept may mean different things to different people. Some variables are more difficult to quantify than others, making it difficult to agree on an appropriate operational definition.

Attributes--Assuming conflicts about attributes, discussed above, are resolved, it may still happen that data gaps arise because the meaning of a variable measured may vary as attributes of unit, time, or place are changed. For example, the meaning of the term unemployment reported by place of residence is not the same as that reported by place of work. Unemployment by place of residence is reported through the CPS and the population census. It is a measure of persons who were not at work but actively sought employment during a reporting week. Unemployment by place of work is reported through State Employment Security agencies. It is a combined measure of persons who are eligible for unemployment insurance benefits and an estimate of uninsured unemployment during the reference week. Unemployment estimates based on place of work may be exceptionally low in those rural areas where employees are not eligible for unemployment compensation. Situations have been observed in which eligible rural workers find it difficult to travel to the town where the Employment Security agency is located and, therefore, fail to apply for benefits. A person could be designated unemployed in the household measure and not be considered in the establishment measure. An additional problem is that multiple job holders will be counted as being employed only once in the household measure but more than once in the establishment measure.

The result is that unemployment estimates from establishment data will always be smaller than estimates from household data. At the same time, employment estimates from establishment data will always be greater than estimates from household data. The concept of labor force is meaningful only with respect to household data. There is no meaningful establishment-based definition of labor force.

Changes in the attribute of place can change the meaning of a variable because of differences in structure. Some commonly defined concepts have different meanings when viewed in a nonmetro compared to a metro setting. The measure of unemployment has a different interpretation for a work force with a relatively high proportion of self-employed. For hired workers, being employed or unemployed is clear-cut, but the self-employed are characterized with degrees of employment not reflected in current unemployment series. This aspect of unemployment is critical for nonmetro estimates, because self-employment is more pervasive than in metro areas. The incidence of self-employment is twice as high in nonmetro areas as in metro areas, and the difference is not completely explained by self-employed farmers. As a result, the unemployment rates for nonmetro areas, which are generally lower than metro rates, probably overestimate the utilization of labor in nonmetro areas. Another reason the nonmetro unemployment rates over-estimate the utilization of labor, compared to metro areas, is related to the labor force participation rate. This rate is lower in nonmetro areas than in metro areas.

Unemployment measures collected for minor civil subdivisions or counties may have the same meaning conceptually as unemployment measures collected for a multicounty functional labor market, but the interpretation by the user may change as the geographic reporting unit changes. Measures for smaller areas might compare unemployment in an agricultural area in a region experiencing rapid nonfarm economic growth with that of the region as a whole. Programs targeted to the subregional problems require different data than programs dealing with the region as a whole. Subregional data are useful for intralabor market analyses and would be masked by the weighted average unemployment rate for the entire commuting region, a measure which might be required for inter-labor market comparisons.

Conceptualization--The initial conceptualization of a data series may appear differently to different actors. Until an operational measure becomes fixed in the statistical reporting process, there is opportunity for feedback and refinement in the conceptualization. For example, before a statistical measure of unemployment was developed, a policymaker might have expressed concern for an unemployment problem in a way which used the term vaguely and qualitatively. A statistician's effort to measure the concept of unemployment would add precision to the term, but might also change the meaning from what the policymaker had in mind. Another statistician in another agency might collect and publish data involving a slightly different operational definition. A theoretician might define the term according to neoclassical competitive equilibrium theory, which would change the concept. Another theoretician might redefine the concept according to the Keynesian model, again changing the conceptualization. Interchange among the policymakers, program monitors, statistical agencies, and theoreticians might eventually lead to a mutually agreeable concept.

On the other hand, they might not agree, in which case a version not mutually agreeable likely would be provided, and opportunities to claim data gaps would arise. This lack of agreement on conceptualization is a current problem in developing an operational measure of underemployment and of hidden unemployment. Some of the difficulties rural development researchers and program monitors have with employment data arise because problems concerning the basic conceptualization of the theory and process of rural development are not yet solved.

Quantifiability--Some variables are more amenable to measurement than others. For example, it is easier to agree on a count of the number of persons employed than on a measure of the quality or productivity of the workers. It is easier to agree on a measure of earnings than on one of attitudes about the quality of life associated with alternative jobs. The less amenable a concept is to quantification, the more likely data gaps are to arise. The less amenable a concept is to quantification, the more an operational definition is likely to change the meaning from what was originally in the mind of policy makers when the problem was identified which gave rise to the need for data.

There is a tendency to assign numerical measures to every data series from numbers of persons employed through quality of occupation to quality of life. Some series are amenable to classification, such as when one says this person is employed and that one is not. Some series are amenable to comparative rankings, such as this job is of higher status than that. And some series are amenable to cardinal measurement, such as this job pays $2,000 per year more than that. Data gaps arise when we seek to force cardinal measures on all possible data items.

Specialization of Data Supply and Demand Institutions

Specialization of data generation and data analysis provides opportunities for closing data gaps. Specialized data gathering agencies can take advantage of size economies; they have become more efficient since the development of computer technology. Growth in data generating and processing agencies have developed concurrently. Raw data supplies can be edited using high speed computer edit routines, thereby reducing time required. Multiple frame sampling, in which area and list frames can be combined, provides improved population estimates from smaller sample sizes.

On the other hand, there are costs associated with increased specialization of data processing operations, including reduced flexibiity for implementing changes. Start up times lengthen since programming routines must be carefully debugged to ensure that correct data are being supplied. Once a routine is operating successfully, strong forces develop against suggestions for change. Reduced flexibility results in prohibitively high costs for special runs to meet certain users' needs. Indications are that some of the newer technologies allowing user access to data banks and software systems are restoring some of the lost flexibility.

Data suppliers sometimes seek to maximize the ease of data collection. This can be accomplished by reducing the number of questions asked and by limiting questions to those which do not offend respondents. Moving beyond

these lines may risk either a refusal by a respondent to answer a questionnaire, or a Congressional investigation into protection of privacy. Asking questions requiring detailed information may lead to an unacceptable level of respondent bias.

Data-using agencies change, too, as research specialization occurs. When data supply agencies are separate from the user agencies, specialization may serve to lessen the researcher's or program manager's awareness of potential and actual data problems. Specialization on the part of users may narrow the types of series used to only those which fit currently used concepts and models. On the other hand, new data processing methods and techniques may lead to situations in which data demanders attempt to maximize data acquisitions. Strong tendencies exist to obtain large quantities of data in order to solve any conceivable problem which may arise. Such demands can lead to unreasonable requests for data.

Communication problems between data supplying and data using agencies increase as agencies grow and develop their own internal logic for survival. These communication difficulties contribute to data gaps and also make gaps harder to close once they are recognized. Intricate communication networks at various levels of operations are necessary to ensure that the needs of both suppliers and demanders are understood and met.

The problems of data supply and demand are lessened for research and monitoring agencies using administrative data generated as part of their ongoing program activities. Working under a central administration, communication gaps are minimized. However, problems of data access by outside agencies or individuals may increase if officials seek to reduce access to information which may place program operations in an unfavorable light.

In the Federal Government, a provision for the collection of statistical information is included in the statutes of many agencies. The statistical organization is divided among agencies according to their subject matter fields. As an aid to reducing potential communications gaps and in understanding how the Government statistical programs are organized, a guide to the statistical services of the U.S. Government has been prepared by OMB [10]. To further facilitate communications among the Federal offices working on statistical programs, a directory has been prepared which lists, by organizational units within each agency, the names, office addresses, and telephone numbers of key persons engaged in statistical programs and related activities of the executive branch [11].

Review and Recommendations

Employment data are needed for research and program monitoring to deal with rural development problems. Available data are often inadequate. A survey, by the authors, of 25 professionals who are concerned with rural employment identified some specific gaps that limited the usefulness of available data. The framework developed in this paper classifies gaps according to source: (1) the data supplied may be obsolete, (2) wanted data may not be supplied, (3) wanted analytic units may differ from available reporting units, (4) wanted detail with respect to time or place may not be provided, (5) avail-

able series may not be sufficiently reliable or accurate, (6) conceptualization of what is wanted may differ from the operational definition of what is offered, and (7) there are gaps associated with the institutional arrangements for providing and using data.

Obsolete

Obsolescence was found to be a source of data gaps in some of the employment data related to agriculture. The agricultural data base was developed when agriculture was considered a relatively independent industry. The data were not designed to describe linkages to the nonfarm sectors of the economy or to compare agricultural employment opportunities with nonagricultural ones. This base has been called obsolete to the extent that it no longer is adequate to answer questions being asked about agriculture. The nonagricultural data base, on the other hand, was developed from an urban point of view and continues to be useful for the purposes for which it was designed. Data gaps with respect to nonfarm, nonurban employment arise not because a data system which was designed for the purpose is no longer considered as useful as it was. Rather, the problem is that there has never been a data base designed to describe nonfarm, nonurban employment. Gaps in data on nonfarm rural employment usually arose from other causes than changing data demands relative to unchanging and formerly satisfactory supplies.

Series Not Supplied

A number of data series which are potentially useful for rural development research and policy, but which are not currently available, were identified by the 25 respondents to the survey. These included information on local labor market structure, such as the degree of monopoly and concentration as compared to competitive labor markets. A number of studies required hard-to-find information concerning institutional arrangements such as laws, regulations, rules, and agreements which affect unions, zoning, or program benefits. Inadequate information was available concerning attitudes and values related to the work ethic, the quality of life, and nonmonetary rewards affecting both volunteer and paid work. Additional series for which more information was desired included measures of underemployment, hidden unemployment, quality of workers and jobs, and productivity. Continued growth and the increasing importance of secondary and tertiary employment opportunities, and relative lack of 4-digit SIC detail for these compared to primary industries, were cited as sources of data gaps.

One way to close gaps in the rural employment data system is to develop new data series, such as those identified in the survey, which are needed to analyze and monitor emerging rural development problems. The tendency is for the user to rely on proxies for needed data or do without rather than find ways to ensure that needed data are supplied. Specific recommendations to close data gaps arising from this source are beyond the scope of this paper. The process requires interaction among (1) program planners and administrators who are concerned with the allied social problems, (2) theorists who can help to conceptualize the problems in a way that interaction can be expected to lessen the problems, and (3) data suppliers who will ascertain that the concepts are operational and will collect the now missing series.

Reporting Units

Reporting units for employment data were not always found to be satisfactory. Data problems were mentioned by respondents to the survey which arose because of a lack of linkages between, say, households and establishments. Problems associated with linkages among units were cited more frequently than problems within units. Additional linkages among different types of units reduces data gaps; for example, by using social security numbers to relate characteristics of establishments, such as value added, to characteristics of households, such as family income.

Reporting units which appear to be approximately comparable and which perform the same reporting function cause gaps when they are not strictly comparable. For example, problems arose when users sought to compare data reported for families, the members of which are related, with data reported for households whether or not the occupants are related to the head.

The usefulness of the way some reporting units are conceptualized was questioned by some respondents. For example, establishments aggregated by SIC code, which is an output based scheme, comprise a classification quite heterogeneous with respect to production technologies, labor-capital ratios, and input use. A classification of establishments by inputs would serve many needs better than the present classification by output. An input based industrial coding system would provide a classification scheme useful for analysis of labor/capital requirements and differences in technologies used by industries producing similar categories of final product. Such a system would have the added advantage of reducing the existing heterogeneity of worker skill levels obtained by classifying establishments according to final product as in SIC.

Concepts are not always the same among reporting units; the Census of Agriculture uses different definitions for some categories of employment than do other censuses. The units reported are not always the ones the users want. For example, areal detail on the county level did not help researchers interested in subcounty labor markets.

Data gaps could be reduced if more attention were given to standardizing the reporting units for employment data, to narrowing the divergence between reporting units available and analytic units needed, and to providing links among units to trace flows of people, goods, and capital. Some consideration should be given to developing a set of factor-market-oriented industry codes in addition to the currently used product-market-oriented SIC codes.

Time Detail

Time considerations were responsible for data gaps identified by several respondents. Linkages over time provide longitudinal and life cycle histories needed for analyzing and monitoring certain rural development problems. Social security numbers which link households reported in the 1960 Public Use Sample with those in the 1970 sample is an example of the kind of linkages considered useful. This may not be as easy as it seems. First, there is the confidentiality issue. Second, there are technical problems; tests have shown that the social security number is not always reported accurately. Third, there is a cost. However, sampling methods might be explored to circumvent these difficulties.

Seasonal, quarterly, or monthly reports are needed to monitor and analyze intra-year fluctuations. The appropriateness of a specific survey date, such as mid-April, to represent characteristics of an establishment or household for the year was questioned by respondents. Additional sampling to provide, say, a quarterly average would better represent the year in question. Time lag in the availability of data was a frequent problem. Current data tend to be grossly aggregative (national samples) and detailed data tend to become available only with a long time lag (county estimates). Redefinitions of terms such as labor force and nonmetropolitan caused data gaps when comparing historical trends. Data gaps could be reduced by increased timeliness of data availability and by provision of linkages which establish life-cycle information for individual reporting units.

Place Detail

Locational or geographic considerations causing data gaps were probably weighted more heavily by the respondents than were other sources of gaps in employment data for rural development. This may be because of the frequent concern by the researchers and program monitors for location-specific rural development problems and for regional relationships. Linkages among areal units were needed to trace flows of people through commuting or migration, as well as flows of goods and capital. Areal reporting units frequently failed to be equated with--or even addable to--preferred analytic units; a labor market may be less than or more than a county in size and not bounded by county or urban limits. Conversions between place of work and place of residence were required to increase the usefulness of some of the employment data. A common plea among the respondents was simply for more geographic detail: disaggregate national data to regions; State data to multicounty districts; and county data to minor civil divisions.

Much of the data that users are asking for is collected but not published. Less detail is published at the State level than national, and less at the county level than State. Three reasons for not publishing such detail are: (1) disclosure rules are violated if the detail is sufficient enough to allow identification of a specific household or firm, (2) the detail would be so voluminous that costs of publication, storage, and access would be prohibitive, and (3) extensive cross-tabulation tends to reduce the number of observations in some cells of the table to a small enough level to raise questions of statistical reliability.

The disclosure problems would be lessened if the priority scheme for geographic detail were changed. Present priorities give detail to State and county political units before inquiring into rural-urban detail. Urban-oriented multicounty areas survive this priority scheme because they are densely populated and allow detailed cross-tabulation. But sparsely populated rural areas fail to have enough observations in the cells of the detailed tables to meet disclosure rules or tests of statistical reliability.

One answer to this is to change the priority rules. For example, if all the nonmetropolitan counties were combined into a single reporting unit, considerable detail could be published to compare nonmetropolitan observations with various metropolitan areas for which detail is published. Next, this non-

metropolitan reporting unit might be disaggregated to the four census regions or to the nine census divisions. The nonmetropolitan portion of States would in many cases contain a large enough population to allow for publication of considerable detail. Detail not publishable for each individual rural county in a State might be publishable for a reporting unit consisting of all the rural counties in that State, or perhaps for the rural counties of a multi-State region.

Household sample data are used to provide quarterly estimates of labor force, employment, and unemployment. These data are published for metro and nonmetro areas. The sample size is being expanded to provide estimates by States. The principle reason given for this expansion is to provide more reliable data to use for allocating program funds to States. For rural development information, metro/nonmetro detail from this larger sample will be desired by some users, but the data base will not support this for all 50 States. It may support it for the 29 States with the largest populations. For the other 21 States, rural interests would be served it multi-State tables were constructed to reveal geographic variations in rural and urban employment and unemployment. Rural development research needs would be served if users had access to a tape with certain economic and social characteristics for each household in the sample, plus an SMSA/nonSMSA identifier for each household.

The problem of volume of printed material if all possible detail were published can be sidestepped by examining forms of user access other than through printed materials. Special runs and tapes with more detail than is published have long been available. But the data supply system is not organized in a way to make this access easy and inexpensive to users. Special runs are costly, while detailed tapes are sometimes unedited and, therefore, not in agreement with published reports. It would help if data suppliers reorganized their distribution methods making special runs and detailed tapes less expensive to acquire and easier to interpret and use.

Detail in some cells of extensive cross-tabulations may lack statistical significance. This is not an insuperable problem to researchers who use statistical techniques, such as regression analysis, to estimate data for empty, or nearly empty, cells from data in other cells in the table. Researchers may not need to see the data in individual cells if a table of sums of squares and cross-products is made available instead. Such procedures solve the problems of disclosure and voluminous detail as well as of reliability. Data which might not be published for general use can be made more readily available to professional researchers and program monitors.

Data gaps could be reduced by increased attention to the usefulness of areal units of reporting, to increased geographic detail, and to linkages among observational units over space.

Statistical Reliability

The reliability or statistical significance of employment data was the source of some data gaps encountered by the respondents. Estimates were generally found to be less reliable for sparsely populated, rural areas. Increased sampling rates for rural areas were recommended. However, even with

complete enumerations, reliability problems arose because of uneven coverage of regions or industries, disclosure requirements, and use of surrogate records and imputations for some establishments. Reliability was more of a problem for detailed, disaggregated data than it was for aggregated totals and central tendencies.

When the data supplier does not make available all the detail collected, the researcher frequently finds himself using statistical methods to estimate the values for observations which are on file in the supplying agency. Additional reliability problems were associated by respondents with errors in published data sources and on computer tapes.

Data gaps could be reduced by increasing reliability by means of larger sample sizes, by providing researchers with access to detail which may not be itself statistically reliable yet is useful for statistical analysis, and by improving the accuracy of published reports and data tapes.

Concepts

A number of variables are a source of data gaps because the way they have been conceptualized and measured for reporting purposes does not meet theoretical or problem-oriented needs of analysts and program monitors. For example, data suppliers may find it convenient to collect data on manhours worked without identifying the number of persons providing these hours. If users are concerned with the implications of a change in duration of employment or family income, they need to convert the manhour data series to full-time worker equivalents. This places the burden for guess work on the data user when the data supplier might have solved the problem by reconceptualizing the questionnaire.

As another example, the concept that the labor force includes only employed persons and those actively seeking work fails to capture those who are unemployed and do not seek work because they know that none is available for which they qualify. The conceptualizations and operations for measuring variables are major sources of data gaps. Data appear to be available to meet a given need, but the measure available does not precisely correspond to the need.

Institutional Arrangements

The separation of data suppliers from data users through increased size, economies of scale, and specialization has many advantages. However, at the same time, this separation was identified by respondents as a source of data gaps. This is because responsibility for resolution of problems, such as lack of comparability among alternative sources for reporting similar series, is frequently abdicated by the user. The supplying agency is left to do the best it can with available time, ingenuity, and resources in the absence of user guidance for meeting specific needs. Gaps in employment data for rural development could be reduced by increased communication and exchange among decision-makers who identify and respond to rural development problems, researchers who analyze and explain them, and data suppliers who collect information with which to describe them.

Conclusion

This paper has provided a framework for identifying data gaps, has shown why, in principle, there will always be some gaps, and has pointed to some possibilities for narrowing present gaps. Some specific gaps identified by a panel of researchers and program monitors were listed. Closing some of the gaps in employment data for rural development research and programs requires a new committment of resources and personnel by the Department of Agriculture, by other Federal agencies, by universities, and by private institutions. New Federal legislation will be needed, including appropriate funding mechanisms. Such a new commitment will not happen without a unified effort on behalf of all participants. It is hoped this paper provides a stimulus for unified thought and that such a commitment may emerge.

APPENDIX: SOURCES OF RURAL AND NONMETRO EMPLOYMENT DATA

The reasons why data were originally gathered may be quite different from how they are currently being used. The Federal government collects data to meet three basic needs: (1) to obtain a population count on which to base Congressional representation, (2) to monitor the Nation's economic progress, and (3) to assess the economy's impact on the well-being of individuals. A data set designed to achieve one of these objectives need not be suitable for achieving another.

The 1790 Census of Population, the Federal Government's first attempt to collect data, was principally a head count used in apportioning Congressional representation. The first economic questions, covering manufactures, were added to the census in 1810. In 1840, the census was expanded to include mineral industries and agriculture. This was in accordance with section 13 of the 1839 Act, which reads in part "...collect and return in statistical tables, under proper heads, according to such forms as shall be furnished, all such information in relation to mines, agriculture, commerce, manufactures, and schools, as will exhibit a full view of the pursuits, industry, education, and resources of the country, as shall be directed by the President of the United States;" [18].

Throughout the second half of the 19th century, the scope of the decennial census continued to grow. By 1890, nearly a full decade was needed to complete the census, and information was no longer provided when it was most needed. Congress responded by limiting the census of 1900 to questions on population, mortality, manufactures, and agriculture.

By the turn of the century, manufacturing industries were playing an increasingly important role in the U.S. economy. Congress responded to the demand for more current economic data by authorizing the quinquennial census of manufacturing, to begin in 1905. As the size and diversity of the economy expanded and more data were needed, separate censuses of agriculture, business, construction, governments, housing, and transportation were initiated.

Data collection has been greatly expanded by technological and methodological developments, while punch cards and computers have made it possible to process large quantities of data. The development and continuing refinement of sampling techniques have enabled the statistical agencies to provide additional current data at a fraction of the cost of a complete census. Mail questionnaires, first used in the 1960 Census of Population, eliminated the need for enumerators to personally interview each respondent, further reducing data collecting costs. Administrative records--for example, Social Security files--have become a source of evaluative and research data. These records are used by the Bureau of the Census to construct mailing lists for census questionnaires, to provide data for small firms not sent questionnaires, and to fill in missing data on returned questionnaires.

Since 1790, when Federal marshalls were used to administer the census, data collection by the Federal Government has expanded considerably--primarily

because of the need for reliable information in determining public policy and in evaluating the performance of economic and social programs. Today, numerous Government agencies are involved in this activity; the largest is the Bureau of the Census.

Organization and Content of the Appendix

The data series contained in this appendix are primarily Government produced. A nongovernment series is produced by Dun and Bradstreet. The data sources cited are continuing series which provide nationwide employment-related statistics for rural areas. Excluded from consideration are data sets which were collected only once or twice, or which are not continuing.

Since the purpose of this appendix is to describe rural employment data, special attention is paid to uniquely rural factors which would affect the coverage or reliability of the data. A brief discussion of the background of the series is included for each data source. Where applicable, a discussion of the linkages and relations between data series is presented. Next follows a description of the elements of the data series and the statistical methodology employed to collect the data. For additional information a reference is given for each data source.

Appendix table 1--Sources of rural and nonmetropolitan employment data

Data series	Source 1/	Population covered	Degree of coverage	Level of greatest geographic detail	Frequency	Data items
Census of Manufactures	Estab.	SIC 20-39	Census	County	5 years	No. of estabs., no. of wkrs., value added., val. of ship., capital. expend. & payroll by ind. & size of establish.
Census of Retail Trade	Estab.	SIC 52-59	Census	County	5 years	No. of wkrs., sales & payrolls by kind of bus. & size
Census of Wholesale Trade	Estab.	SIC 50,51	Census	County	5 years	No. of workers, sales & payrolls by type of operation, kind of business & size
Census of Selected Service Industries	Estab.	2/	Census	County	5 years	No. of wkrs., receipts & payrolls by kind of bus. & size
Census of Mineral Industries	Estab.	SIC 10-14	Census	County	5 years	No. of workers, manhours, receipts, payrolls and supplemental labor costs by size of firm
Annual Survey of Manufactures	Estab.	SIC 20-39	Sample	SMSA's, lgst.	yearly	Workers, payrolls, value added, value of shipments by industry and size
Census of Agriculture	Estab.	Farms	Census	County	5 years	No. of regular & seasonal farmworkers, hired farmworkers, labor expend. at State level by value of farm sales & SIC
Annual Economic Survey of Agriculture	Estab.	Farms	Sample	North, south,west	yearly	Expenditures for wages, fringe benefits, in-kind payments to hired workers
Farm Labor Survey	Estab.	Farms	Sample	States	qrtrly.	No. of family & hired workers, avg. hours worked by farm operators, other unpaid family members, how wage rates
Census of Governments	Govt. units	State, local	Census	County	5 years	
Employment of major local governments						Total, full-time, and full-time equiv. wkrs., payrolls & avg. mthly. earns. by type of govt. & selec. functions
Compendium of public employment						Employment & payrolls by govt. functions, level of govt. & enrollment size group
Management-labor relations in state and local government						Particip. in wkr. organizations, type of labor relations policy & no. of work stoppages by ind. and type of govt.

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Appendix table 1--Sources of rural and nonmetropolitan employment data -- Continued

Data series	Source 1/	Population covered	Degree of coverage	Level of greatest geographic detail	Frequency	Data items
Public Employment	Govt. units	State & local	Sample	Largest SMSAs; state	yearly	No. of workers, payroll by type of govt. & function
Census of Population	Hshld.	All hshlds.	Census	County 3/	10 years	Emp. status, occup., industry by demographic charac. 2/
Current Population Survey	Hshld.	All 4/ hshlds.	Sample	Largest states, metro, nonmetro	monthly	Employment status, employment characteristics by demographic characteristics 2/
County Business Patterns	Admin. records	Soc. Sec. regis.	Census	County	yearly	No. of estabs. by no. of wkrs. & ind., taxable payroll
Department of Labor Establishment Data	Estab.	Nonagr. employ.	Sample	Substate	monthly	Employment, payrolls, average hours, and average earnings by industry
Continuous Work History Sample	Admin. records	Soc. Sec. regis.	1 percent sample	County	yearly	Age, race, sex, industry, earnings
Continuous Wage and Benefit History	Admin. records	Unemp. ins. claim.	Sample	County	monthly	Unemployment coverage, earnings, work history, demographic characteristics
Dun and Bradstreet	Admin. 2/ records	Selec.ind .	Census 2/	St.address	yearly	Emp. by firm size, sales vol., ownership structure
Bureau of Economic Analysis Employment Data	Admin. records	Labor force	Census	County	yearly	No. of full and part-time wage & salary wkrs., no. of proprietors of uninc. bus. by broad ind. group

1/ Distinguishes data obtained by a statistical agency directly from an establishment or household from data obtained from administrative records filed by establishments, governments, or individuals.

2/ See text.

3/ Selected information for selected smaller geographic units is reported for most series; see text.

4/ Of the civilian noninstitutional population.

Economic Censuses

Economic censuses include manufactures, retail trade, wholesale trade, selected service industries, mineral industries, construction industries, transportation, and government services. They describe the economic structure which accounts for nearly four-fifths of the national income originating in the private sector. Principal groups not covered are finance, insurance, and real estate; agriculture and forestry; communications; electric, gas, and sanitary services; and most health and medical services. Economic censuses provide essential information for constructing the national income and product accounts, furnish benchmarks for various surveys and indices, and describe economic structure for use by businessmen, professional associations, policymakers, and researchers.

The censuses covering manufactures, retail trade, wholesale trade, selected services, and mineral industries provide employment data for counties and metropolitan areas; therefore, they are an important source of employment data for rural development research and policy. These censuses are discussed separately below. The census of governments is discussed in a later section. Geographic detail of the census of construction industries is published only to the State level, and the census of transportation is based on a sample of geographic areas. Therefore, neither of them provide data with sufficient geographic detail to be considered below for purposes of rural development information.

Employment data comprise all full-time and part-time employees, including those on paid sick leave, paid holidays, and paid vacations during the pay periods covering the week of the survey. This may bias downward estimates of employment in rural areas where such benefits are less extensively used and therefore where workers are more likely to be absent without pay during the week of the survey. Production workers in manufacturing industries are reported as an average of survey data collected for midmonth employment for four survey weeks in March, May, August, and November. Until 1977, employees in the trade and service industries, on the other hand, were only counted if they were on the payroll during the mid-March survey week. For manufacturing, administrative employees and employees other than production workers are reported as of mid-March. The seasonal differences in method of reporting means that employment of manufacturing production workers is not strictly comparable to other paid employment. The seasonal measure of employment in retail trade may create potential data problems for research in rural areas with strong seasonal variations in employment.

Proprietors and partners in unincorporated businesses are not included in the census, but salaried officers and executives of corporations are included. Data are provided for proprietorships and partnerships, providing the research and program monitor a basis for imputing the number of actively engaged proprietors and partners based on knowledge of the particular industry. Information on active proprietors and partners is not available from administrative records. Active proprietors and partners are typically found in nonemployer and other small firms. This may bias downward estimates of employment in rural areas which contain a disproportionately large share of proprietors, partners, and self-employed persons.

The censuses cover the year previous to that in which data were collected. For example, questionnaires for manufacturing covering the year 1972 were sent out in January 1973, and collection was completed by July. No questions were asked to link the firm's 1972 activities to those of other years.

The 1977 economic census covers manufactures, minerals, and transportation. Some 2.5 million firms received a questionnaire. This represents about half the Nation's firms. Information from administrative records provide data for other firms. General questions asked of all firms include the kind of business and its location, type of ownership, dollar value of business in 1977, number of employees, and total payroll. Major employment data items collected in the 1977 economic census are shown in the accompanying table.

Relation to Other Series

Economic censuses make extensive use of administrative records from the Internal Revenue Service (IRS) and the Social Security Administration (SSA) for the name, address, payroll, gross receipts, and industry code. Prior administrative records provide part of the mailing list, but current records provide some of the payroll and gross receipts data for nonmail and nonresponse cases.

Results of the censuses are used as inputs to, and benchmarks for, a number of general economic indicators (available annually, quarterly, and monthly), such as the national income and product accounts and indices of production and prices. These series are used to describe the U.S. economy and form government policy. However, employment estimates from the economic censuses are not directly comparable with annual average employment reported by the Bureau of Labor Statistics, Department of Labor, for the census years. The latter estimates are constructed by averaging survey week employment estimates obtained monthly for the calendar year.

Linkages with other series are derived from mutual dependence on administrative records, on uses of the censuses as inputs to construction of other series, and on reliance on standard definitions of concepts, such as place, establishment, and industry. For example, it is possible to compare the establishment data in the censuses with corporation data in the Internal Revenue Service's "Statistics of Income" by aggregating the establishment data to the corporation level. Comparison of Census establishment data with IRS corporate data can only be carried out by the Census Bureau because of the laws of confidentiality. The most recent result of such an attempt is the Census Bureau's 1967 Enterprise Statistics, Part 3, "Lists of Census Establishments and IRS Corporation Data."

Linking the census data on corporations with the "Statistics of Income" data must be approached with caution. The "Statistics of Income" uses the reporting entity--employer identification number (EIN), firm, etc.--and assigns a principal industry activity (PIA) code to that entity based upon the primary activity of the entity. The entity may represent one or many establishments in various kinds of business.

Economic census employment data are approximately comparable to those reported in County Business Patterns (CBP) because both define employment

Appendix table 2--Major employment items collected in the 1977 economic censuses

Data item	Mining	Manufacturing	Wholesale trade	Retail trade	Service industries	Construction
Employment:						
Production (construction workers--quarterly	X	X				X
Other employees	X	X				X
Total employment--quarterly			X	X	X	X
Total employment--annual average	X	X				
Payrolls:						
Production (construction) workers	X	X				X
First quarter total	X	X	X	X	X	X
Annual total	X	X	X	X	X	X
Supplemental labor costs:						
Legally required programs	X	X	S	S	S	X
Other programs	X	X	S	S	S	X
Total	X	X	S	S	S	X
Production workers manhours, quarterly	X	X				
Total receipts	X	X	X	X	X	X
Legal form of organization	X	X	X	X	X	X

Source: Data User News, Vol. 12, No. 12, U.S. Department of Commerce, Dec. 1977.

X = question asked for the indicated census.
S = data collected on a sample basis; results published at the national level only.

according to Treasury Form 941. However, differences will arise because imputational techniques differ slightly for missing data, the sets of data differ in overall scope of businesses covered, the observation units can differ, and the industry classifications of observation units can differ. The CBP scope is more extensive than that in the economic censuses, although both include all of the same kinds of business. CBP does not, however, cover non-employers. The observation unit is the establishment, and the mailing list is the same for the census and for CBP. The data are not comparable with employment estimates in the census of population for which the observation unit is the household.

Census of Manufactures

Manufacturing establishments are engaged in the mechanical or chemical transformation of materials or substances into new products, assembling component parts, or blending materials. Inquiries on manufacturing, covering the year 1809, were included in the 1810 census of population. In the farm-oriented economy of the early 19th century, industrial statistics played a relatively small role in national policy formulation. The first manufacturing census to be conducted separately from the census of population was taken in 1905, covering the year 1904. Since 1939, the censuses have been approximately quinquennial. The Secretary of Commerce was authorized by Title 13 of the United States Code, amended in 1964, to collect and publish a census of manufacturing covering 1967 and every fifth year thereafter.

Description of Series

The census of manufactures obtains data on an establishment's input of labor, materials, and capital, its output, its location, and the legal form of organization. Data are reported on employment, payrolls, hours worked, production, prices, inventories, orders, investment in structures, fuels, and water. Establishments are classified by industry, size by value added, size by number of employees, homogeneity of output, type of operation, kind of equipment, relationship to other plants of the same firm, and occasionally by extent of vertical integration. Establishments are classified into 450 4-digit industries encompassed by Standard Industrial Classification (SIC) codes 20 to 39.

Regional detail at the State level has been available on manufacturers for over a century. Since 1909, reports at the level of the nine census divisions have been used to overcome State-level disclosure problems. Starting with the 1967 census, detail up to the 4-digit SIC code level has been shown for any Standard Metropolitan Statistical Area (SMSA) when it would not disclose individual establishment data and the industry had at least 250 employees. Value added by manufacture in all SMSA's accounted for 78 percent of the U.S. total in 1972. Data at the 2-digit level are published for any individual city with 450 or more employees in an industry, subject to disclosure rules. Data at the 2- and 3-digit level are published for any individual county with 450 or more employees in an industry, subject to disclosure rules. Size of employment detail published for cities and counties is total establishments and establishments with 20 or more employees. There is a special location of manufactures tape which includes the number of establishments and employment by county at

the 4-digit level. Geographic linkages between a central administrative office and other establishments of the same company are not shown. These priorities provide maximum detail for large areas and for urban areas, but minimum detail for small areas and rural areas. Tables for nonmetro parts of the nation, regions, divisions, and States would provide useful employment information for rural development program monitoring and research.

Statistical Procedures

Administrative records from the IRS and SSA are used to identify companies. Those with no employees (approximately 104,000 establishments in 1972) were excluded from the census. Those with one to nine employees (approximately 120,000 establishments in 1972) were excused from filing the questionnaire. Income and payroll tax returns for these small firms were used to estimate gross business receipts and payrolls and to obtain the industry classification. Other census statistics for these small firms were imputed using industry average ratios to sales and payrolls. Mail-in questionnaires were sent to all known manufacturing companies with 10 or more employees. Proxy returns were generated from administrative records for nonrespondents.

Over half the plants covered in 1972 had less than 10 employees; they accounted for less than 3 percent of total manufacturing employment. For the purpose of producing statistically reliable data at the national level, the imputational approach is efficient and effective. However, the data may provide questionable descriptions of economic opportunities for employment in small establishments in rural locations.

References

The following reports can be ordered from the U.S. Government Printing Office, Washington, D.C. 20402.

Census of Manufactures. U.S. Department of Commerce, Bureau of the Census

- Vol. 1: Summary and Subject Statistics, Series MC72(1).
  A general summary for 1972 with some comparisons to earlier censuses and with some State and regional data. Includes detail on survey methodology.
- Vol. 2: Industry Statistics, Series MC72(2).
  Data for 450 manufacturing industries with some State and regional data.
- Vol. 3: Area Statistics, Series MC72(3).
  Data for each State and for selected SMSA's, counties, and cities.

A special computer tape on "Location of Manufacturing Plants" includes the number of establishments in each of the 450 industries by county and by employment size. Contact:

Industry Division, Economic Censuses
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233

Census of Retail Trade

Inquiries on distributive trade were included in the decennial census of 1840. The first census of business, which included retail and wholesale trade, was taken in 1929. Since then, the retail trade censuses have been approximately quinquennial. Title 13 of the United States Code authorized a census of retail trade in 1967 and every fifth year thereafter.

Description of Series

The census of retail trade includes all establishments primarily engaged in selling merchandise for personal and household consumption, and rendering services incidental to the sale of goods. Establishments are classified into 65 4-digit industries encompassed by SIC codes 52 to 59. Information is collected concerning location, kind of business, volume of sales and payrolls, and the number of employees.

The geographic area reports by State present data on the number of establishments, sales, payroll, employment, and number of proprietorships and partnerships for the State, SMSA's, and areas outside SMSA's by detailed kinds of business. They also present data for counties and cities with 500 retail establishments or more by varied kind-of-business detail. Statistics are furnished on number of establishments and sales for 10 major kind-of-business groups for cities of 2,500 inhabitants or more and for all counties.

Statistical Procedures

Administrative records from the IRS are used to identify companies. Mail-in questionnaires are sent to known retail trade establishments with four or more employees and also to a 10-percent sample of establishments with one to three employees.

Firms with annual payroll are divided into three classes in the Censuses of Retail Trade and Service Industries:

(1) Multiunits -- All known multiunits receive census forms. In 1972, multiunits accounted for 45 percent and 35 percent of retail and service sales and receipts, respectively. Imputation, is fairly insignificant in the aggregate, but may be important for some rural areas. The procedures for imputing at the establishment level are the same as those used in wholesale trade.

(2) Single units above the mail cutoff -- A wide difference exists between what constitutes a "small" new car dealer and a "small" family shoe store. Mail cutoffs are established in such a manner that 85 percent of the dollar sales volume of a kind of business should be represented by the mail universe. All establishments above this cutoff are mailed forms. In addition, in order to get the trailer information, such as merchandise lines, floor space, analysis of receipts, etc., which are not available from administrative records, a sample of firms below the mail cutoff is included in the mail universe.

(3) Single units below the mail cutoff and nonresponse mailed single units -- Data are obtained by the same procedures for wholesale trade. The administrative records are matched and provide a surrogate report. The surrogate

reports are based on data reported to the Federal government on payroll, sales and employment; they are as accurate as the responsible agencies require in implementing their regulatory program. Moreover, the information requested on the census forms is in conformance with generally accepted accounting practices, and the same definitions used in the census are used for reporting data on Forms 1040, 1065, 1120 and 941.

Sales information for nonemployer firms is obtained from IRS records. About two-thirds of the establishments had from zero to three workers. These establishments, a disproportionately large share of which are located in nonmetropolitan areas, contributed to about 13 percent of the sales volume.

References

The following reports can be ordered from the U.S. Government Printing Office, Washington, D.C. 20402.

Census of Retail Trade. U.S. Department of Commerce, Bureau of the Census.

Vol. I: Summary and Subject Statistics, Series RC72(1).
A general summary for 1972 including establishment and firm size by legal form or organization, capital expenditures, merchandise line sales, and miscellaneous subjects such as the number of gallons of gasoline sold by county.

Vol. II: Area Statistics, Series RC72(2).
Data for each State, and selected data for selected cities and counties.

Vol. III: Major Retail Center Statistics, Series RC72(3).
Provides geographic detail within SMSA's on location of retail trade establishments. MRC reports are presented on the number of establishments, sales, payroll, and employment for each SMSA, for each city of 100,000 or more inhabitants and its CBD, and for other major retail centers in the SMSA that have 100 or more retail establishments. In addition, for smaller MRC's, the number of stores is shown by kind of business, and sales are shown for three major kind-of-business categories. For those SMSA's with one or more cities of 100,000 inhabitants or more, data are also shown for the SMSA, central city, and CBD on percent change in sales from 1967 to 1972 and percent distribution of 1972 sales by kind of business. Maps in each report show the total area covered, define the CBD's and locate the MRC's in the SMSA.

Requests for special tabulations may be sent to:

Business Division, Economic Censuses
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233.

Census of Wholesale Trade

Inquiries on wholesale trade activity have been taken concurrently with those for retail trade since the first data were collected covering the year 1929. It was part of the first census of distribution. Title 13 of the United States Code authorized a census of wholesale trade in 1967 and every fifth year thereafter.

Description of Series

The census of wholesale trade includes all establishments with one or more employees primarily engaged in selling merchandise to retailers, to industrial, commercial, institutional, farm, or professional users, to other wholesalers, or acting as agents or brokers in buying merchandise for, or selling merchandise to, such persons or companies. Firms without employees are not included in the wholesale trade census because administrative records make no distinction between commissions and gross sales for wholesalers. Establishments are classified into 61 4-digit industries encompassed by SIC codes 50 and 51. Information is collected concerning location, kind of business, volume of sales and payrolls, number of employees, end of year inventories, and operating expenses.

Regional detail by kind of business is provided for the four census divisions, nine census regions, States, SMSA's, and counties with 200 or more establishments. For the State, data on wholesale operations are presented separately for merchant wholesalers, manufacturers' sales branches and offices, and merchandise agents and brokers. Statistics also are presented by kind of business for the State and SMSA's with 2,000 or more establishments. Less detailed kind-of-business data are presented for SMSA's with less than 2,000 establishments and for counties with 200 or more establishments. In addition to the above census data items for total wholesale trade, statistics are furnished separately on number of establishments and sales for merchant wholesalers for cities with 5,000 or more inhabitants or more and for all counties.

Statistical Procedures

Administrative records from the IRS and SSA, and previous census information, are used to identify companies. All known wholesale firms with payrolls are sent questionnaires for each establishment operated. In 1972, about 370,000 firms were identified.

References

The following reports can be ordered from the U.S. Government Printing Office, Washington, D.C. 20402.

Census of Wholesale Trade. U.S. Department of Commerce, Bureau of the Census.

Vol. I: Summary and Subject Statistics, Series WC72(1). Provides a general summary, including detail by kind of business, for U.S. divisions, regions, States, and selected

SMSA's. Aggregate payroll and employment data for the 100 counties with largest payroll are included.

Vol. II: Area Statistics, Series WC72(2).
Provides detail by kind of industry for State, SMSA's, and counties with 200 or more establishments. Number of establishments and sales are presented for merchant wholesalers and other operating types for counties and for cities of more than 5,000 inhabitants.

Requests for special tabulations may be sent to:

Business Division, Economic Censuses
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233.

Census of Selected Service Industries

Inquiries on various services related to trade were included in the business census of 1933. The censuses of selected services have gradually expanded in coverage and have been approximately quinquennial since then. Title 13 of the United States Code authorized a census of service industries in 1967 and every fifth year thereafter.

Description of Series

Censuses of service industries include establishments primarily engaged in rendering a wide variety of services to individuals and business establishments. Prior to the 1977 census, it has been limited to the following SIC codes: 701, 703, 72, 73, 75, 76, 78, 79, 8072, 81, and 891. For 1977, however coverage has been expanded to include all industries in division I of the Standard Industrial Classification (SIC) Manual except for households and religious organizations. These newly covered industries are represented by the following SIC codes: 702, 704, 80 (except 8072), 82, 83, 84, 86 (except 866), 892, 893, and 899. Information is collected concerning location, kind of business or operation, volume of receipts (or expenses, for tax-exempt entities), payrolls, and number of employees. In addition, special information is collected for selected kinds of business.

Regional detail by kind of business is provided for divisions, regions, States, SMSA's, and counties and cities with 300 or more establishments. The 250 largest cities and counties are ranked by volume of receipts. In the subject series of reports, specialized data on employment and payroll are provided for selected industries in varying geographic detail. Except for the counties mentioned above, data on employment and payrolls for counties and for cities of 2,500 or more inhabitants are aggregated and published subject to disclosure rules.

Statistical Procedures

Administrative records from the IRS as well as on-going census surveys are used to identify companies and organizations. Firms with paid employees are identified from Federal income tax withholding records. In general, mail-in questionnaires are sent to establishments within census scope which employ four or more workers and to a 10 percent sample of establishments with one to three employees.

For some kinds of activity, however, the need for specialized data precludes reliance solely on administrative records for smaller establishments. Consequently, for such kinds of business, all establishments are sent a questionnaire. Receipts data for nonemployer firms are obtained from Federal income tax records. Data on receipts, payroll, and employment for small employer firms not sent a census questionnaire are generally obtained from IRS and SSA administrative records. About four-fifths of the establishments had zero to three employees but accounted for only one-fifth of the receipts volume.

References

The following reports can be ordered from the U.S. Government Printing Office, Washington, D.C. 20402.

Census of Selected Services. U.S. Department of Commerce, Bureau of the Census.

Vol. I: Summary and Subject Statistics, Series SC72(1). Provides a general summary, including detail by kind of business, for divisions, regions, States, and specialized data for selected industries by varying geographic detail.

Vol. II: Area Statistics, Series SC72(2). Provides detail by kind of business for States, SMSA's, and counties and cities with 300 or more establishments. Aggregate data on employment and payroll and data on establishment numbers and receipts volume for five kind-of-business groups, are provided for counties and for cities of 2,500 or more inhabitants.

Requests for special tabulations may be sent to:

Business Division, Economic Censuses
Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233.

Census of Mineral Industries

Data relating to the mineral industries were first collected as part of the 1840 census of population. Beginning in 1954, the census of mineral industries was conducted more frequently. In 1967, it became quinquennial being administered the same years as the other economic censuses.

Description of the Series

The census of mineral industries is conducted on an establishment basis. Through the enterprise statistics program, it is possible to link mineral establishment-based data on a modified basis to other statistical systems such as the Internal Revenue Service's "Statistics of Income" for corporations. The census of mineral industries provides information used in constructing the national income and product accounts, and in the input-output studies of the Bureau of Economic Analysis. The census also provides information used to develop indexes of production for census years.

The category "all employees" comprises all full and part-time employees on the payroll of mining establishments who worked or received pay for any part of the pay period which included the 12th day of the month included in the report form. Information on production, development, and exploration workers is as of March, May, August and November. The 4-month average is shown in the published report. Information for other employees is as of March.

The data reported include total employment, payroll, production-worker employment, man-hours, wages, cost of materials, value of shipments, capital expenditures, and value added by mining. These data are published by industry, area, and employment size of establishment.

General statistics for mineral industries, including total number of establishments, number of establishments with 20 or more employees, number of employees, and payrolls, are published by county. The number of establishments for each 2-digit SIC code are shown by county. These are by size class to the extent permitted by disclosure rules.

To present census data at an intermediate level between the U.S. total and those for the individual 50 States and the District of Columbia, the Census Bureau has used regional groupings for over a century, publishing data for the nine geographic divisions. These groupings are essential in presenting a maximum of geographic information when the individual State data cannot be shown without disclosing figures for individual companies. To further segegate data in the major oil producing States, selected figures are shown on a district basis in the oil and gas industry reports for Texas, Louisiana, New Mexico, and California.

Statistical Procedures

The census of mineral industries includes establishments primarily engaged in mining and covers SIC groups 10 to 14. These are subdivided into 42 4-digit industries. The production of minerals, particularly stone, sand, and gravel by Federal, State and local governments, is excluded from the census. Also excluded is some production of these items by highway contractors and construc-

tion contractors who do not maintain separate records for sand and gravel production. The census includes, however, mining establishments of the same company, such as coal mines serving only coke ovens operated by the same company, oil and gas wells serving only refineries, public utilities owned by the same company, and copper mines and mills where all of the ore is transferred to a company-owned smelter.

Multilocation companies submit separate reports for each location. A company engaged in distinctly different lines of activity at one location submits separate reports if the plant records permit such a separation and if the activities are substantial in size. For oil and gas field operations and contract services, reports are required for units somewhat different from the establishment reporting unit used for other types of mining. Every concern which operated oil and gas wells, drilled such wells for its own account or for others, performed exploration work for oil or gas, or performed oil and gas field services or other mining services for others during any part of the census calender year was required to submit a separate report for each State off-shore area adjacent to a State where they operated. Information on employment, oil and gas production, receipts for services, and capital expenditures was requested by county.

Mining companies with one to four employees were excused from filing reports. Approximately 7,600 companies fell into this category in 1972. Data for these companies are obtained from the SSA and the IRS. Estimates for data other than payrolls and sales for these small establishments are constructed from historical industry ratios.

All other firms are mailed a questionnaire. The mailing list is constructed from SSA and IRS records. Counts for establishments with 20 or more employees are far more reliable than the total number of establishments. More than half the establishments have zero to four employees, but these produce only about 4 percent of the value added.

Reference

U.S. Bureau of the Census
Census of Mineral Industries, 1972
Subject Series: General Summary, MIC72(1)-1
USGPO,1975

For area data see:
Area Series, MIC72(2)
USGPO

Annual Survey of Manufactures

The annual survey of manufactures (ASM) was initiated in 1949 and has been conducted every year since then. It is an integral part of the census of manufactures in the years the census is conducted.

Description of Series

The data collected by the ASM are quite similar to that collected by the quinquennial census of manufactures. The establishment, as in the economic censuses, is the observation unit. However, in ASM, once an establishment of a company is selected, all the establishments of that company are drawn into the survey. The data are reported for each establishment. The ASM is based on sample data for smaller firms. The data collected include the total number of employees, number of production workers, other employees, amount of total payrolls, production worker wages, salary and wages for other workers, total manhours for production workers, total cost of materials, value of shipments, capital expenditures, and value added. A request for information on expenditures for supplemental labor costs was added to the questionnaire in the late 1960's. This information has been published regularly, starting with the 1967 expenditures.

The data are published at the national level by 4-digit SIC codes, and for divisions, States, SMSA's, and large industrial counties by 2- and 3-digit SIC codes, subject to disclosure rules.

Statistical Procedures

The ASM sample consists of a complete enumeration of all large firms, those with one or more establishment with 100 or more employees (for SIC 23 and 27, the cut off is 250 employees), and a sample of smaller firms. The sample is supplemented by SSA records identifying new and small firms. The total sample consists of about 60,000 establishments (of which about 37,500 are large firms), and is controlled for efficient estimation of product class totals. The sample of smaller firms is rotated after every census year. Efforts are made to obtain data from firms which operate only part of the year, due either to seasonal operation, opening of a new plant, or closing of an existing plant. During those years the census of manufactures is taken, the ASM panel is identified as a subset of the census and the data are edited and tabulated following ASM procedures.

References

The following report describing methodology can be ordered from the U.S. Government Printing Office, Washington, D.C. 20402.

The Annual Survey of Manufactures: A Report on Methodology. Jack L. Ognus and Donald F. Clark. U.S. Department of Commerce, Bureau of the Census, Tech. Paper No. 24, 1971.

Census of Agriculture

The census of agriculture originated with a few questions added to the population census of 1840 requesting information on livestock and crops. The 1850 census was the first to obtain data on the number of farms and acreage. Every 5 years since 1920, there has been an agricultural census separate from the population census. The more recent censuses have collected data on the number of farms, farm characteristics, livestock, poultry, livestock and poultry products, crops, crop values, irrigation, drainage, agricultural services, type of farm operation, farm finances, number of regular and seasonal hired farm workers, and production expenses,including wages paid. Selected social and economic characteristics of farm operators were collected but later discontinued.

Legislation passed by Congress in 1976 has mandated that the census of agriculture, which was last conducted in 1974, be conducted in 1978, in 1982, and every 5 years thereafter to conform with reporting years for the economic censuses.

Relation to other Series

Employment data collected from the census of agriculture are not comparable with data collected from any other source. Agricultural employers provide an estimate of the total workers hired during the census year. The resulting figure overstates, by an unknown factor, the number of persons employed, since some farmworkers have more than one employer. An estimate of self-employed farmworkers is not available from this source.

Description of the Series

Extensive data are collected on the income, expenses, and quantity of output of farms, and on the number of employees working 150 or more days and less than 150 days on a particular farm. For the 1974 census, information was obtained which subdivided the less than 150 days into 25 to 149 days and under 25 days. For farms with sales of $2,500 and over, data for expenditures for hired and contract labor and the number of workers are shown at the State and county level. In addition, at the State level, these data are shown cross-classified by tenure of operator, size of farm, type or organization, value of products sold, and for a number of SIC categories. For the 1974 Census, farm operators were asked to classify themselves as farmers or in other occupations based on the majority of their work time.

Beginning in 1969, the census included a special survey which collected data for establishments whose primary activities were providing agricultural services. Data on payroll and number of workers were collected and published by county and State.

Statistical Procedures

Censuses of agriculture for 1969 and 1974 were conducted on a mail-out/mail-back basis using a mailing list of about 4 million names assembled from various administrative records. Lists include those who filed IRS form 1040F (for farm operators and persons with farm income), form 1040C (for farm

businesses), form 1065 (for farm partnerships), form 1120S (for farm corporations), and form 943 (for farm employees). Lists maintained by the Agriculture Stabilization and Conservation Service of the U.S. Department of Agriculture and records from prior censuses also were included.

The definition of a farm used for census purposes has been changed a number of times over the years to adjust to the changing agricultural situation. For the 1974 census, a farm was defined to include all land on which agricultural operations were conducted at any time during the census year under the day-to-day control of an individual manager and from which $1,000 or more of agricultural products were sold during the census year.

Coverage of the census is measured and published showing the characteristics of farms which were missed and not included in census totals.

References

The following reports describe methodology and available publications from the U.S. Government Printing Office, Washington, D.C., 20402.

Census of Agriculture, 1969. U.S. Department of Commerce, Bureau of the Census, 1973.
Vol. II: General Report; Chapter 1, General Information: Procedures for Collection, Processing, Classification.
Census of Agriculture, 1974. U.S. Department of Commerce, Bureau of the Census, 1977.
Vol. I: State and County Data

Annual Economic Survey of Agriculture

The Statistical Reporting Service (SRS) of the U.S. Department of Agriculture began an annual farm expenditure survey in fiscal year 1973. Under a reorganization effective January 1, 1978, SRS became a part of the Economics, Statistics, and Cooperatives Service (ESCS). The annual survey is designed to provide data needed for regular updating of weights for the index of prices paid by farmers for goods and services.

Relation to Other Series

Data for hired employment reported from this survey are conceptually similar to nonfarm establishment employment data reported by the Bureau of Labor Statistics. However, this data series reports employment for persons 14 and over, while the BLS data reports employment of people 16 and over.

Numbers of operator and unpaid family workers differ conceptually from household data reported by the Bureau of Labor Statistics and, thus, cannot be compared. All active farm operators are included in totals reported by the farm labor survey, while only persons whose principal activity was farm operators are reported by BLS. The age distinctions noted above are also applicable to farm operators.

Employment data from this series are not comparable to data reported from the December supplement to the CPS. These household data provide an estimate of the total people 14 and older who did any hired farm work during the calendar year.

Description of Series

The survey is conducted annually to obtain information on farmers' expenditures on physical plant materials, insurance, taxes, debts, and labor. Employment-related information includes annual expenditures for wages, fringe benefits, and in-kind payments to hired workers. The data are reported for the Nation and for three subnational regions: the North, South, and West.

Statistical Procedures

A multiple-frame survey design is used to collect the data from approximately 20,000 farms. The data are collected by personal interview in two sample groups. The sample design consists of an area frame and a list of farms with sales exceeding $20,000.

Reference

The following report describing methodology can be ordered from the U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Washington, D.C., 20250.

Scope and Methods of the Statistical Reporting Service.
U.S. Department of Agriculture, Statistical Reporting Service, Misc. Pub. No. 1308, July 1975.

Farm Labor Survey

ESCS and its predecessor agencies of the U.S. Department of Agriculture have provided estimates of farm employment since 1909 and estimates of farm wages since 1866. From 1909 through 1924, farm employment estimates were annual averages for the Nation; from 1925 through 1933, national monthly estimates were published. In 1934, regional breakdowns were included, and in 1950, monthly estimates by State were provided. In January 1975, USDA switched to a probability sample and produced quarterly estimates by State. Data are published quarterly by USDA in Farm Labor.

Description of Series

Beginning in 1975, data have been obtained quarterly from a sample representing all farm operators. Data are collected by mail, telephone, and personal enumeration. The survey weeks include the 12th of January, April, July, and October to be consistent with other Government employment series. Farmworkers are counted more than once if they worked on more than one sampled farm during the survey week. Information is collected on the type of work performed, the method of pay, hours worked, and wages paid for the farm operator, unpaid family members, and hired farmworkers.

Number of workers and average hours worked are computed for the farm operator and unpaid family workers. The same is provided for hired workers, along with wages by type of work and method of pay. Workers on farms, hours worked, and wage rates for all methods of pay are estimated by State. National average wages are reported by worker activity and method of earnings payments. Average annual employment is reported as an average of the quarterly data. Geographic detail is provided at the State level.

Statistical Procedures

In January 1975, a multiple-frame probability sample was instituted to collect the quarterly farm labor and wage data. A sample of farms stratified by the number of workers is supplemented by an area frame sample which measures incompleteness of the list. This results in a total sample covering approximately 17,000 farms.

The survey identifies one farm operator for each farm family member, and any partners and their families that worked without pay are considered unpaid family workers. The operator is counted if he worked at least 1 hour during the week; partners or unpaid family members are counted if they worked 15 hours or more.

Hired workers include family members who are paid and other workers who did agricultural jobs for 1 hour or more for pay during the survey week. Excluded from the hired worker category are crew leaders, crews employed directly by the crew leader, and other agricultural service employees working on a fee or contract basis. These excluded workers are sampled on a separate farm services survey for which National average employment totals are released in May.

Quarterly instead of monthly reporting means that the estimates may not always reflect peak labor periods. The coefficient of variation for hired and family workers is less than 5 percent at the national level. For State estimates, it is 10 to 20 percent for hired workers and 7 to 15 percent for family workers.

Reference

The following report describing methodology can be ordered from the U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Washington, D.C., 20250.

Scope and Methods of the Statistical Reporting Service.
U.S. Department of Agriculture, Statistical Reporting Service, Misc. Pub. No. 1308, July 1975, p. 124.

Census of Governments

The census of governments began as part of the decennial census of population. The first questions appeared on the 1840 census, requesting information on the number of pupils and the number and kind of schools. The scope of the census broadened in 1850 when collection of data on property valuation began. Collection of data on government debt and taxes began in 1870. In 1880, detailed information was collected directly from local government officials on the number of schools; details of cities, including drainage, sewers, utilities and public services; and financial information. The census of governments was separated from the population census in 1902 and was conducted in 1913, 1922, 1932, and 1942. In 1950, Congress enacted legislation providing that a census of governments be taken quinquennially beginning in 1952 (Title 13, Section 161, U.S. Code). However, due to a lack of appropriated funds, the first census taken under the provisions of the 1950 legislation was not conducted until 1957. Since then, the census of governments has been conducted quinquennially in years ending in 2 and 7.

Relation to Other Series

Data in the census of governments are based on institutional units of observation such as States, counties, municipalities, townships, school districts, and numerous kinds of special districts. These data are comparable to establishment employment data from other economic censuses; they are not directly comparable with data collected from households.

Description of Series

The 1972 census of governments is structured in four phases: (1) governmental organization, (2) taxable property values, (3) governmental employment, and (4) governmental finances. This discussion applies to phase 3.

Information on public employment and payrolls was assembled as of October 1972. The survey covered all State agencies and all local governments in the Nation. The data include numbers of employees and payroll amounts by function and by type of government, and statistics on retirement coverage and certain other fringe benefits available to public employees. The information has been published by State, county area, metropolitan area, and major individual units of government. Tabulations have been produced on the extent of public employee organizations; government labor-management policies for dealing with employee organizations; the number of labor-management agreements made during the 12-month period ending October 15, 1972, and in force as of the ending date; and number of work stoppages during the period by function of government, reason(s) for stoppage, and the method(s) of resolution.

For the purposes of the census, the term employee included persons paid during October for personal services performed, including paid officials, persons on paid-leave status, and temporary help including school employment. Unpaid officials, pensioners, employees of private contractors, and persons whose work was performed on a fee basis were excluded.

Statistical Procedures

The universe for the governmental employment phase of the 1972 census of governments included the Federal Government, the 50 State Governments, and the 78,218 local units of government. Data were collected primarily by mail questionnaire covering employment during pay periods which included October 15; all data were adjusted for publication to represent the month of October. Data for Federal employees were obtained from the Civil Service Commission.

Since all information collected is from governmental units, the data are in the public domain and, thus, there is no disclosure problem due to confidentiality requirements, as is true with the economic censuses.

Care should be exercised when interpreting data for school districts or other special districts, since many do not conform to boundaries of prevailing political subdivisions for which other data are reported.

References

Additional information is contained in the following reports available from the U.S. Government Printing Office, Washington, D.C., 20402.

Census of Governments, 1972. U.S. Department of Commerce, Bureau of the Census, 1975.
Vol. 9: Procedural History.
Vol. 3, No. 1: Employment of Major Local Governments
Vol. 3, No. 2: Compendium of Public Employment
Vol. 3, No. 3: Management-Labor Relations in State and Local Governments

Computer tapes are available from:

Bureau of the Census
U.S. Department of Commerce
Washington, D.C. 20233

Public Employment

An annual survey of all State governments and a stratified random sample of local governments is used to provide yearly updates of the quinquennial census of governments. Reporting of public employment and payrolls data began in 1940, and provided summary Nation-wide estimates, by type of government for the first month of each quarter. Before 1946, coverage was limited to non-school employment. Educational employees and payrolls were estimated on an annual average basis from data made available by the U.S. Office of Education. Beginning in 1946, survey coverage was broadened to include the education component.

State estimates by level of government have been issued at least once a year since the early 1940's, but without functional detail except for a dis-

tinction between school and nonschool components. Since 1955, responsibility for measuring intrayear changes in employment and payrolls of State and local governments has rested with the BLS. .The Bureau of the Census conducts an annual survey which provides national and State data for the month of October.

Relation to Other Series

These annual updates of the quinquennial census of governments include sample-based estimates for local governments, but do not provide as extensive geographic detail as found in the quinquennial census of governments.

Description of Series

An annual survey conducted by the Bureau of the Census collects data from State government agencies and a State-by-State sample of local governments (counties, municipalities, townships, school districts, and special districts) on employment and payrolls for the month of October. Figures are collected, by function, on numbers of full-time and part-time employees and on payrolls. The findings are reported nationally and by State, with breakdowns of employment and payrolls by type of government and function. Data for municipal governments also are published by population size group and with individual presentations for each of approximately 400 cities having 50,000 or more inhabitants. County government employment and payroll data are published by population size group and with individual presentations for each at about 330 county governments having 100,000 or more inhabitants. Beginning in 1972, data have been published on employment and payrolls of local governments in 72 major SMSA's, their component county areas, and other county areas of 200,000 or more population not within the largest SMSA's.

Statistical Procedures

The annual survey collects data from all State government agencies, and from a sample of approximately 16,000 local governments and school systems.

References

The following reports describing methodology can be ordered from the U.S. Government Printing Office, Washington, D.C., 20402.

U.S. Bureau of the Census, 1972
Vol. 9, Procedural History, 1975.

Public Employment in 1976. Series GE-76, No. 1.
City Employment in 1976. Series GE-76, No. 2.
Local Government Employment in Selected Metropolitan Areas and Large Counties: 1976. Series GE-76, No. 3.
County Government Employment in 1976. Series GE-76, No. 4.

Census of Population

The census of population was first conducted in 1790. It has been conducted every 10 years since, as mandated by the Constitution, for purposes of apportioning seats in the House of Representatives among the States. Throughout most of the 1800's, data pertaining to economic activity, as well as population, were collected by the population census. Over time, the economic censuses were developed and administered separately. In 1902, the Bureau of the Census was established as a permanent Federal agency primarily responsible for enumerating the population and for compiling statistics on other subjects.

Relation to Other Series

The decennial census is used as a benchmark for many intercensal series, such as the monthly current population survey which also is based on a place of residence concept and uses households as observation units.

Because the 1970 census employment data were obtained from respondents in households, they differ from statistics based on reports from individual business establishments, farm enterprises, and certain government programs. Workers aged 14 and 15 are excluded from detailed tables, but totals are provided. Persons employed at more than one job are counted only once and are classified according to the job at which they worked the greatest number of hours during the reference week. In statistics based on reports from business and farm establishments, persons who work for more than one establishment during the survey week are counted more than once. Establishment data published by the BLS exclude private household workers, unpaid family workers, self-employed persons, and persons who are included in household data.

An additional difference in the data arises from the fact that persons who had a job but were temporarily furloughed without pay are considered to be employed for purposes of the census of population but are likely to be excluded from employment figures based on establishment payroll reports. Population census data include persons on the basis of their place of residence regardless of where they work, whereas establishment data report persons at their place of work regardless of where they live. This latter consideration is particularly significant when data are being compared for areas where workers commute between areas.

The unemployment figures of the population census are not comparable with figures based on unemployment compensation claims data. Generally, persons such as private household workers, agricultural workers, State and local government workers, self-employed workers, new workers, and workers whose rights to unemployment benefits have expired are not eligible for unemployment compensation, and, therefore, are excluded from counts derived using these administrative data. The qualifications for drawing unemployment compensation differ from the definition of unemployment used by the population census. Persons working only a few hours during the week and persons temporarily absent from work for reasons other than layoff are sometimes eligible for unemployment compensation but are classified as employed in the population census reports. Differences in unemployment levels by the geographical distribution arise because the place where claims are filed may not necessarily be the same as the place of residence of the unemployed worker. Population census data reflect

unemployment by place of residence; establishment series reflect unemployment by place of work.

Description of Series

The census of population collects household data every 10 years. Each person is counted as an inhabitant of the usual place of residence. The information collected includes demographic and employment characteristics of the population and characteristics of housing units. Recent legislation has authorized a mid-decade census beginning in 1985.

The 1970 census of population obtained data on family composition, including size, race, sex, and age. Samples were used to obtain data on employment status, education, occupation, industry affiliation, earnings for 1969, place of work, and means of transportation to work. Sample data also were collected on industry affiliation, occupation, and place of residence 5 years earlier.

The data are available at several levels of geographic detail. Population counts are available for counties, county subdivisions, all incorporated places, and unincorporated places of 1,000 inhabitants or more. Statistics on age, sex, race, marital status, and relationship to the head of household are available at the same levels of geographic detail.

Family and individual statistics are published for States, counties (by urban, rural-nonfarm, and rural farm residence), SMSA's, urbanized areas, and places of 10,000 or more inhabitants for the following: on State or country of birth, race or ethnic origin, mother tongue, residence 5 years ago, year moved into present house, school enrollment, years of schooling completed, number of children ever born, family composition, veteran status, employment status, place of work, means of transportation to work, occupation group, industry group, class of worker, and income (by type) in 1969. Additional data, such as vocational training and disability status, are collected but not published.

Data are available on computer tapes. Summary tapes provide information on geographic units as detailed as the 250,000 enumeration districts. Public use sample tapes provide individual records, but do not have metro/nonmetro designations for all States due to disclosure restrictions.

Statistical Procedures

Beginning in 1960, the decennial census has been conducted principally by mail questionnaire. It is estimated that the 1970 census resulted in an under-enumeration of about 5.3 million persons. In 1970, three types of questionnaires were used throughout the country. Eighty percent of the households answered a form containing a limited number of population and housing questions; the remainder (split into 15-percent and 5-percent samples) answered forms which contained these questions, as well as additional questions. Some of the additional questions were the same on the 15-percent and 5-percent versions. A random procedure was used to determine which of the three forms any particular household received. The sample data may be used with confidence when large numbers are involved, but they limit the usefulness of the census as a source of small area data.

Comparable data from the 1960 census are based on a 25-percent sample of the population. Most of the sample items from the 1950 census are based on a 20 percent sample. Labor force data were collected on a 100 percent basis in 1940, but as sample data in all later censuses. With few exceptions, all statistics available for the 1940 and earlier censuses are based on 100 percent data.

Reference

The following reports describing methodology and available publications can be ordered from the U.S. Government Printing Office, Washington, D.C., 20402.

Census of Population: 1970. U.S. Department of Commerce, Bureau of the Census.
General Social and Economic Characteristics. Final report PC)1)-C1, United States Summary.
Detailed Characteristics. PC(1)-D27.

Current Population Survey

Prior to the development of the current population survey (CPS) and its predecessors in the late 1930's, no direct, current measurement of jobless persons existed beyond the decennial census. The first intercensal attempt to obtain national estimates of unemployment using probability sampling was the enumerative check census taken as part of the 1937 unemployment registration. The Works Progress Administration developed the sample survey of unemployment which was initiated in March 1940 as a monthly activity. Responsibility for this survey was transferred to the Bureau of the Census in 1943. The basic employment status questions were formulated in 1945 and have changed little since then. The CPS is the source of the monthly unemployment statistics published by the Department of Labor.

Relation to Other Series

The decennial census of population is used for establishing the sample design. Both the census of population and the CPS use households of the civilian noninstitutional population as the unit of observation. Many of the concepts, such as the definition of employment and unemployment, are the same in the two series. CPS data may differ from population census data because of sampling variability as well as differences in the enumeration process and procedures. The focus of the population census is on geographic detail at infrequent time periods; that of the survey is on current, monthly series, but with limited geographic detail.

The concepts used in the household series are different from those used in series collected from establishments. See discussions of the census of population and of the Department of Labor establishment survey data.

Description of Series

The CPS collects detailed information from households on the employment status of the population for the weeks including the 12th of each month. This information is used by BLS to estimate official Government unemployment rates. The data obtained include total employment, hours worked, industry and occupation group, age, race, sex, education, and information on the reasons for nonparticipation in the the labor force. Metropolitan and nonmetropolitan data appear quarterly in Employment and Earnings, published by BLS. Computer tapes are available from the Bureau of the Census for each month. These tapes contain individual record data identifying metro and nonmetro residence, large states, census region, and census division. In most months, supplemental questions are added to the basic CPS questionnaire to obtain additional information on a wide range of topics. The supplements for 1976 are described after the following section on statistical procedures.

Statistical Procedures

From early 1973, when the redesign of the CPS sample based on the 1970 Decennial Census was completed, through the end of 1977, the monthly CPS national sample consisted of approximately 55,000 assigned households (47,000 interviewed) located in 461 sample areas comprising 923 counties and independent cities with coverage in every State and the District of Columbia. In September 1975, an additional 9,000 households per month were added to the sample in 24 States and the District of Columbia to improve the reliability of annual average unemployment data for those States. Data from these additional households were included in the monthly national unemployment estimates in January 1978. This information is currently collected from a sample of about 56,000 households representing 614 areas which are comprised of 1,113 counties and independent cities. There is coverage in each of the 50 States plus the District of Columbia. Plans are being formulated for a further expansion of the sample by approximately 50,000 households per month to produce more reliable estimates of State-level unemployment on a monthly basis.

The survey is administered by trained enumerators. The sample population is rotated so that a household is interviewed for four consecutive months, is off for eight months, then returns for four months.

The sample design of the CPS is based almost entirely on the distribution of the population reported in the most recent decennial census. The coverage of nonmetro areas is in proportion to population. Since the rural population is sparse, this results in limited statistical reliability for nonmetro areas. Figures are available for nonmetro areas beginning with the third quarter of 1973.

The definition of metropolitan areas used in the sample is based on population statistics from the 1970 census. New SMSA county designations made by OMB from 1973 forward are not included. Consequently, the CPS definition of metropolitan areas may differ from that used in other published sources, but is consistent with data from published reports of the 1970 census of population.

1976 CPS Supplemental Surveys

March 1976

Annual Demographic Supplement

The demographic supplement has been sponsored annually by the Bureau of the Census and BLS. The March 1976 supplement obtained information on work experience by weeks employed full- or part-time, weeks unemployed, major reason for not working, industry and occupation of longest job during the year, income by source during the previous calendar year, migration within the country since March 1, 1975, household composition, family characteristics, educational attainment, and some housing characteristics. Data were collected in the full CPS sample plus an additional 2,500 sample of households of Spanish-origin selected from the November 1975 CPS.

April 1976

Survey of Food Stamp Recipiency

The food stamp supplement, taken in April and August of 1976, was sponsored by the Department of Health, Education, and Welfare. It obtained information on the number of households who purchased or received food stamps during the previous 15 months and the value and amount paid for food stamps in the most recent month since January 1976. The information was collected in the full CPS sample.

Farm Population

Estimates of April-centered farm population and related farm and nonfarm employment data are sponsored by the Bureau of the Census and USDA. A joint annual report is issued. Published data are weighted averages of 5 quarterly estimates centered on April. The January, April, and July data are weighted 0.250 each, and the two October estimates are weighted 0.125 each. The April center makes the data comparable with the April information in the census of population. The quarterly averages are used to improve the statistical reliability of the farm population estimate.

May 1976

Survey of Jobseeking Activity of the Unemployed

The job-seeking supplement was sponsored by BLS. It obtained information on the kinds of jobs unemployed persons were seeking and the methods and intensity with which such persons were looking for work. Data were obtained on reasons for refusing any job offers during the last month of the current period of unemployment, most recent job lasting at least 2 consecutive weeks, highest paying job since January 1974 if different from the most recent, and other characteristics (job-seeking problems, sources of income, family adjustments, etc.) during unemployment. The information was collected by mail-back questionnaire from all unemployed persons 16 years old and over in the full CPS sample.

Survey of Multiple Jobholding and Premium Pay

This survey was sponsored by BLS, and obtained information on the incidence and characteristics of multiple-job holders (persons working at more than one job during the survey week). It also determined if wage and salary employees working more than 40 hours at one job received premium rates of pay. Information was obtained on the beginning and ending times of work for wage and salary workers who worked during the survey week, usual days and hours worked, weekly and hourly earnings, and labor union membership for all employed and recently unemployed wage and salary workers. The data were collected in the full CPS sample.

June 1976

Survey of Children Ever Born and Expectancy of Children

The children supplement was sponsored by the Bureau of the Census. It obtained information from women 14 to 59 years old who had ever been marrried, including reports on the total number of children ever born and the date of birth of the most recent child. Information was obtained from married women 14 to 39 years old and unmarried women 18 to 29 years old to determine if they expected to have (more) children and, if so, the number expected and expected year of birth of their next child. The data were collected in the full CPS sample.

July and August, 1976

Survey of Work History and Job Search Activities of Persons Not in the Labor Force

The work-history supplement was sponsored by BLS to obtain information concerning previous employment (last job, hours worked, salary, reasons for leaving, etc.) and unemployment (methods used to find work, type of job sought, weeks looking, reasons for having stopped looking, etc.) as well as future plans to look for work (type of job, acceptable salary, etc.). July and August represent the peak employment months for seasonal jobs.

August 1976

Food Stamp Survey

This survey was sponsored by the Department of Health, Education and Welfare (HEW) and repeated the August 1974 and 1975 surveys. It concerned receipt of food stamps during previous 12 months, cost and value of food stamps received in most recent month, receipt of other transfer payments, monthly family income in July, and housing expenses.

September 1976

National Immunization Survey

The immunization supplement was sponsored by HEW and the Communicable Disease Center (CDC). The data provided counts of persons immunized against,

and incidence of, specified diseases, and determined the incidence of these diseases and of certain heart and respiratory ailments and chronic kidney disease.

October 1976

School Enrollment Survey

This supplement was sponsored by the Bureau of the Census and BLS. It has been an annual survey covering enrollment of persons 3 years old and over by type of school and grade level. Other questions concerned the living arrangements of college students and vocational training of persons 14 years old and over but not enrolled in regular school.

November 1976

Voting Survey

The voting supplement was sponsored by the Bureau of the Census. It has been a biennial survey to obtain information on voting, registration, and reasons for not voting or registering.

December 1976

Hired Farm Workers

The hired farm workers supplement is sponsored by USDA. It has been an annual survey of days of farm and nonfarm work for cash wages or salary, farm and nonfarm earnings, migrant status, and major employment status during the year. These questions are asked only of persons in the CPS sample who indicate that they have done or expect to do hired farm work at some time during the calendar year. About 4 percent of the total sample respond to this supplement. A report is issued annually by the Economics, Statistics, and Cooperatives Service, USDA.

References

The following publications can be obtained from the U.S. Department of Labor, Bureau of Labor Statistics, Washington, D.C.

Concepts and Methods Used in Labor Force Statistics Derived from the Current Population Survey. BLS Rpt. No. 463, Series P-23, No. 62, Oct. 1976.

Employment and Earnings published monthly by the Bureau of Labor Statistics.

County Business Patterns

County business patterns (CBP) have been published annually by the Bureau of the Census since 1964, and at irregular intervals since 1946. The data are useful for analyzing market advertising programs, setting sales quotas and budgets, analyzing the industrial structure of regions, making basic economic studies of small areas, and serving other business uses. They are also useful to government agencies for administration and planning purposes.

Relation to Other Series

CBP employment data follow definitions used by other establishment data sources. The series provides detailed industry employment data at county levels, as of mid March. The data are not directly comparable with data tapes available from the Bureau of Economic Analysis, U.S. Department of Commerce, which uses ES 202 series administrative data as the basic source of information. The observation unit for CPB data prior to 1974 was the social security reporting unit. Hence, employment for mulitunit firms were assigned to the county from which social security reports were filed rather than the county in which employment was located. Since 1974, employment for firms covered under the Social Security Act has been tabulated by county in which the employee works.

Tabulations since 1974 are on an establishment basis instead of on a company basis. In prior years, for nonmanufacturing industries, employers were counted only once in each county no matter how many establishments they operated in the same type of business. Also, the inclusion of data collected by the Bureau of the Census annual organization survey permits the inclusion of data on total payrolls for the entire year, thus overcoming one of the inherent drawbacks of previous CBP's which were limited to first quarter Federal Insurance Contribution Act (FICA) taxable payroll and failed to reflect the wage situation for seasonal operations.

Description of Series

The County Business Patterns' data provide information on most economic subsectors of the economy (agricultural services, mining, construction, manufacturing, transportation, public utilities, wholesale trade, retail trade, finance, insurance and real estate, and services). Those groups excluded from CBP are government employees, self-employed persons, farmworkers, domestic workers, and railroad employees subject to the Railroad Retirement Act. Summary data are provided on the number of employees for the mid-March pay period, first quarter total payroll, total annual payroll, number of establishments, and number of establishments by employment-size class. Estimates of the number of establishments operated by self-employed in covered industries are provided at the U.S. level. Data are tabulated by detailed kinds of business based on the 1972 revised standard industrial classification designations. The data are available annually by industry for the Nation, States, and counties.

Statistical Procedures

The data in CBP are drawn from administrative records and represent the following types of employment covered by the FICA: all covered wage and salary employment of private nonfarm employers and of nonprofit membership organiza-

tions under compulsory coverage, and all employment of charitable, educational and other nonprofit organizations covered under the elective provisions of the FICA.

Data are obtained from the Bureau of the Census standard statistical establishment list (SSEL) which consists of several data files that are updated annually. Data are obtained from the IRS form 941 (providing payroll data), SSA form 941, schedule A, covering the mid-March pay period employment (providing employment data for single establishment employers), and the SSA 5-quarter file covering FICA wages. These data are used as an aid in editing the administrative records file and Bureau of the Census annual organization survey (providing multi-establishment employer employment and first-quarter and annual payroll data for each establishment).

The data are tabulated from universe files and, therefore, are not subject to sampling errors. Nonsampling errors can be attributed to many sources: firm mobility which reduces the number of firms contacted, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the data obtained, and other errors of collection, response, coverage, and estimation for missing data. No direct measurement of the impact of these factors has been obtained. However, precautionary steps are taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize the effect of nonsampling errors.

Reference

The following report describing methodology is available from the U.S. Government Printing Office, Washington, D.C., 20402.

County Business Patterns, 1975—United States Summary, General Explanation. U.S. Department of Commerce, Bureau of the Census, 1976.

Department of Labor Establishment Data

The Department of Labor, through the BLS and the State employment offices, releases monthly establishment data covering national, State, county and labor market areas. Some of these series are derived directly from administrative sources, others from sample surveys.

The first monthly employment series released by BLS began in October 1915, covering four manufacturing industries. The program scope expanded slowly until 1930, when Congress authorized a much expanded program based on Federal and State cooperation. With the growth of unemployment insurance and other social insurance programs, the need for uniform place of work statistics on employment and related subjects also grew. By 1949, all States were included in the system.

Relation to Other Series

National Survey Data -- Survey employment data gathered to meet the statistical standards of BLS are published monthly. Industry coverage is

broader than that included in County Business Patterns but excludes farm and nonfarm self-employed and unpaid family workers. Data for some agricultural service industries, such as veterinary services and feed and supply stores, are included under the nonagricultural sector.

Data are not directly comparable with monthly labor force data published from the current population survey which are derived from household responses. The employment estimates compare favorably with annual average BEA employment estimates at State or higher levels of geographic aggregation. However, BLS estimates include only domestic civilian personnel, while BEA estimates include domestic and overseas civilian and military personnel.

State Administrative Data -- State employment security (ES) offices gather monthly data from firms covered under the unemployment insurance system. Industry and type of worker coverage is similar to that included under the BLS national survey series and, thus, compares with the nonagricultural employment totals of BEA, CBP and CPS estimates in the same way as the BLS series. The administrative data used to develop the ES estimates are also the source used to provide annual benchmarks for the national survey series.

Description of the Series

National, State, and Area Survey Data -- The industry employment statistics published from this monthly survey are drawn from a universe representing all wage and salary employees on payrolls of nonagricultural establishments during the weeks including the 12th of each month. For Federal Government establishments, employment figures represent the number of persons who occupied positions on the last day of the month. Intermittent workers are counted if they performed any service during the month. Covered industries include mining; contract construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance and real estate; services; and government. Data are available for most industries at the 3-digit SIC level, with some detail at the 4-digit level for manufacturing. Individual firms which are engaged in more than one activity and keep separate payroll records are treated as separate establishments and are identified with the appropriate industry code. In addition to total employment by industry, published data include women employees by industry and production workers by industry. Average weekly hours, average weekly earnings, and average hourly earnings are published for nonsupervisory or production workers by industry. Labor turnover is available for mining and manufacturing. Monthly employment totals are published by industry division in Employment and Earnings for the Nation, States, and 220 major metropolitan areas. Information for rural areas can be read from these published data only by subtracting metropolitan workers from total State or National workers.

State Administrative Data -- Employment estimates are prepared monthly by each State office from Unemployment Insurance (UI) system administrative records. These records, which include about 90 percent of total nonagricultural wage and salary employment, are supplemented by administrative data from the Social Security Administration, the Civil Service Commission, and the Interstate Commerce Commission. Employment totals for the government sector

and the railroad industry are obtained from the latter two sources. Hired farm employment is estimated from monthly farm labor reports made by State employment security personnel.

Farm and nonfarm wage and salary employment totals are tabulated monthly by major industry group for counties. The data are published by the individual States and National summaries are not available.

Statistical Procedures

Administrative data are tabulated from information on the ES-202 report. National survey data are collected by the States using BLS approved procedures. Data are collected from a sample of nonagricultural establishments using the BLS-790 form. Excluded from coverage are proprietors, the self-employed, unpaid volunteer and family workers, and domestic household and hired farm workers. Over 160,000 employing units, hiring 41 percent of the employees, were included in the 1976 survey. Most large employing units enter the sample with certainty, and smaller establishments are sampled at varying rates depending on industry size distributions. To ensure continued accuracy of the sample, the employment estimates are benchmarked annually using March administrative data. Administrative records used in this process are obtained from Unemployment Insurance, the Civil Service Commission, and the Social Security Administration. These records also are the source for State and small area estimates released monthly by the State employment security offices.

Approximately 8,700 separate State-level employment series and hours and earnings series for 3,400 industries were published in 1975 by cooperating State agencies. At the national level, the program produces a total of over 2,600 published series including Spendable Earnings and Indexes of Manhours and Payrolls.

References

The following report describing methodology and statistical series of the BLS can be ordered from the U.S. Government Printing Office, Washington, D.C., 20402.

BLS Handbook of Methods. U.S. Department of Labor, Bureau of Labor Statistics, Bul. 1910, 1976.

Major Programs 1977. U.S. Department of Labor, Bureau of Labor Statistics, 1977.

Employment and Earnings. U.S. Department of Labor, Bureau of Labor Statistics (published monthly).

Continuous Work History Sample

The BEA developed a system in the mid-1960's for summarizing and making available the work force employment and migration data included in the one percent Continuous Work History Sample (CWHS). With the cooperation of SSA, the BEA established a CWHS data system that provides information for regional economic and demographic analysis.

The BEA-SSA cooperative program recently received interagency sponsorship for its development of a 10 percent CWHS data file for 1971 and 1973. The Department of Housing and Urban Development (HUD) provided much of the funding for this project because of its interest in developing data systems useful for state and substate planning purposes.

Relation to Other Series

Since all the data contained in the several CWHS files are obtained from SSA records, only Social Security covered employment is included. Major groups not covered, which represent about 10 percent of paid employment, are Federal civilian employees, employees of State and local governments who have not been covered by a Federal-State agreement, certain agricultural and domestic workers, and employees of those nonprofit organizations which have not arranged for the Social Security coverage of their employees.

Estimates of employment and unemployment will, therefore, be different from those estimated from households establishments, and unemployment insurance data.

Description of the Series

The Continuous Work History Sample data are obtained from the administrative records of employer reports to the SSA. The data available are age, race, sex, industry of employment, county or city of employment, and earnings. Several data files have been constructed by BEA for analytic and policy research. Small area identifiers are included in the available computer tapes.

One-Percent Annual Employee-Employer File -- This is a 1-percent sample of workers containing one record for each job held during each year. The file contains about 1.4 million records for approximately 900,000 workers for the years 1957 through 1972. A new file is available approximately 2-1/2 years after the end of each year. Wages for the first quarter earnings only are reported for nonfarm workers, annual earnings of farm workers are reported up to the maximum taxable wage levels. Data identifiers include State, county, and industry of employer, as well as a coverage group indicator (farm, household, State and local government, other).

One-Percent Annual Self-Employed File -- This file contains records of self-employed individuals filing Schedule SE of IRS form 1040. The characteristics identified are age, race, sex, taxable income, net earnings, taxable earnings, farm, nonfarm, State, county, and industry. About 61,000 records were included in 1972, and data are available from 1957 through 1972. Updating procedures are on the same basis as the employee-employer file.

One-Percent Longitudinal Employee-Employer File -- Data elements in this file are identical to those in the 1-percent annual employee-employer file; however, this file is structured so that all records for an individual appear together, thus facilitating longitudinal analysis. The file is assembled for 1957 through 1972.

One-Percent 1937-to-Date Continuous Work History Sample File -- This file contains the same data items for worker characteristics as do the other files, but is available from 1937. Geographic location of employment is not included.

One-tenth Percent 1937-to-Date Continuous Work History Sample File -- This file is identical to the one-percent file except that there are fewer records, making this file easier to work with. Again, there is no information on location of employment.

First Quarter Files -- One-percent and 10-percent files have been created which provide the same data as the 1-percent annual employee-employer file, but contain information only for the first quarter of each year. These files are available within about 1 year after the end of the reference year. Disadvantages include the absence of farmworkers and late reporting firms. About 6 percent of the 1973 sample were unclassified by State and county.

In addition to computer tapes, several standard tabulations using these files are available from BEA. These are migration and summary tabulation; structure of migrants, nonmigrants, entrants, and exits; work force structure; longitudinal analysis; and commuter tabulation.

Statistical Procedures

Data on earnings and employment are derived from reporting forms submitted to the SSA by employers and self-employed persons. The taxable wages of employees are reported quarterly on form 942 by household employers, on form OAR-S3 by state and local government employers, and on form 941 by most remaining employers. Farm employers report quarterly earnings annually on form 943. Self-employed persons report only annual earnings on schedule SE of form 1040.

Personal characteristics are obtained from Social Security applications, form SS-5. Geographic and industrial data for employers are obtained from applications for identification numbers, form SS-4, from other forms used periodically to update these applications, forms OAA-100, OAA-102, SSA-5019, and from periodic updates with data from the economic census.

Location by place of employment is identified. Multi-establishment firms (having at least 50 employees with at least six in a separate location) are requested to file a supplemental form showing establishment location, industrial activity, and approximate number of employees for each establishment located in a different county. The sample is thin for small areas, but the user has access to small area identifiers which can be used to build up geographic units.

Reference

The following report describing methodology can be ordered from the U.S. Department of Commerce, Washington, D.C.

Regional Work Force Characteristics and Migration Data: A Handbook on the Social Security Continuous Work History Sample and its Applications. U.S. Department of Commerce, Bureau of Economic Analysis, Dec. 1976.

Continuous Wage and Benefit History

The continuous wage and benefit History (CWBH) sample was originated in 1966 by the Manpower Administration (renamed the Employment and Training Administration) to provide information on unemployment insurance claimants. These data are primarily used to evaluate the effectiveness of the unemployment insurance (UI) program, and to modify the system to make it more responsive to the changing needs of society. A pilot project was begun in 1976 to revise and expand the CWBH program. The new system will provide an extensive, longitudinal data bank on the employment and unemployment experience of claimants and provide benchmark employment data for workers covered under the program.

By early 1978, 15 States were involved in the pilot project: Georgia, Iowa, Idaho, Maine, Nevada, New Mexico, North Carolina, Pennsylvania, South Carolina, Missouri, Wisconsin, New York, Utah, Louisiana, and Washington. California was completing a feasibility study.

The following description of the CWBH sample is based on a preliminary manual compiled by the Unemployment Insurance System, U.S. Department of Labor.

Relation to Other Series

The CWBH sample is compiled from administrative records and supplemental questionnaires administered to a sample of claimants of the unemployment insurance system. Linkages with other data series are limited. As only those receiving UI benefits are in the sample, estimates of unemployment will not be consistent with estimates from either household or establishment based survey series or with other series based on administrative records other than UI. This data base does, however, provide an excellent source of data on the characteristics and experience of UI claimants, and provides time linkages to earlier employment information for the same claimant.

Description of Series

Data are collected by the State unemployment insurance offices for a sample of claimants and include employment and earnings, characteristics of previous employers, and family characteristics. The value of benefits paid and the program under which eligibility is determined are available. Limited employment data are available for a sample of covered workers. Identifiers are obtained for county of residence, county of last employer, and county of UI

office where claims were filed. The data bank is designed to be updated monthly. The time delay from local collection to national availability is not yet known.

The CWBH data base consists of two files--an active file and a history file. Each file contains records on individual wage data, individual claim characteristics, individual claim history, and individual benefit payment history. The history file contains wage and claim data which are at least 18 months old. Sample data purged from active files are merged into the history files.

Statistical Procedures

The national CWBH sample is constructed from data files on UI claimants submitted monthly by each State. The sampling rate for each State varies so as to obtain uniformly high levels of statistical reliability. Each State sample contains 6,000 to 10,000 records of unemployment claimants and 140,000 to 150,000 records of covered workers. All States are to be covered in the national file. The data are thin for small areas, but the user has access to small area identifiers which may be used to build up geographic units.

The data are obtained from the initial unemployment insurance claims form, supplemented by an additional questionnaire completed by the sample population.

Reference

The following report describing methodology can be ordered from:

U.S. Department of Labor
Employment and Training Administration
Division of Program Research
Office of Research and Actuarial Services
Patrick Henry Building
601 D. St., N.W.
Washington, D.C. 20213

Continuous Wage and Benefit History, Data Bank Manual (preliminary). M. Ishikawa, Unemployment Insurance System.

Dun and Bradstreet

The Dun and Bradstreet Corporation collects information on firms to provide data to perform credit checks. Their services have been expanded to provide data for performing marketing research.

Relation to other series

There is little comparability between the Dun's Market Identifiers (DMI) file and establishment data from other sources, because the file was not designed to be statistically representative, either as a sample or a complete

enumeration. The purpose of the file is to perform credit checks on individual firms, not to provide uniform data to program monitors and researchers. However, the user can compare aggregates of the DMI file with data from other sources to judge representativeness. The DMI file provides more geographic detail, without disclosure, than other sources.

Description of Series

The DMI files contain information for establishments on location (street address), value of sales, number of employees, industry affiliation by 4-digit SIC, and ownership, indicating whether an establishment is headquarters, branch, or single-unit operation. Industry affiliation includes as many as six SIC codes per establishment. Each record contains the date the establishment began operation and the last transaction date with Dun and Bradstreet. The DMI file is not subject to disclosure rules, so it can become a valuable source of industrial detail for small areas.

Statistical Procedure

The DMI file is neither a sample nor a complete enumeration. It includes those firms which provide data with which to perform credit checks. Over 70 percent of all establishments and employees covered by County Business Patterns were included in the 1972 DMI file. Coverage by industrial sector ranged from less than 50 percent for services to more than 90 percent for manufacturing. The data for a region or an industry may or may not be representative; there is no way, given the DMI procedures, to tell without making comparisons with other sources known to be representative.

The files are updated daily. For data users, historical files as of December 31 of each year are available. However, there is no assurance that all the information in the historical file has been updated. In reporting employment, all employees are assigned to the headquarters location for reporting total employment of their company. They are also reported by establishment location.

References

Using the Dun and Bradstreet Data for Research on Regional Economic Development. Peter M. Allaman. Mass. Inst. of Tech. and Harvard Univ., Joint Ctr. for Urban Stud., Working Paper No. 4, October 1975.

Data and further information can also be obtained from:

Dun and Bradstreet, Inc.
Marketing Services Division
99 Church Street
New York, NY 10007
(212-285-7514)

Inquiries from Federal Government sources may be directed to:

Dun and Bradstreet, Inc.
Marketing Services Division
1600 Wilson Blvd. Suite 805
Arlington, Va. 22209
(703-528-0220)

Bureau of Economic Analysis Employment Data

The Bureau of Economic Analysis in the Department of Commerce has developed, as an adjunct to its personal income series, an annual employment series (beginning with the year 1967) for all States and counties, including independent cities of Virginia and the census divisions of Alaska.

Relation to Other Series

BEA's measure of wage and salary employment and the BLS 790 employment series are conceptually similar; both are a count of jobs rather than of persons (i.e., persons employed by more than one establishment are counted at each place of employment), and both measure employment in the context of place of work. The two series differ, however, in coverage. The BLS series excludes farm workers, domestic workers employed by households, and the military, whereas the BEA series includes measures of all three.

The BEA data are not comparable with employment data from the Census of Population or from the Current Population Survey, both of which report on a place-of-residence basis.

Description of Series

The county series, as released to the public, includes separate estimates of the number of self-employed (farm and nonfarm), as well as the number of wage and salary workers by industry division. (Estimates are derived in 2-digit detail; but, because of disclosure problems, the detail is available for release only at the State level.) County level data are available by request subject to disclosure regulations. Beginning with 1975, the industry detail is based on the 1972 revised SIC designations. The data are available on a place-of-work basis only.

BEA's employment estimates of wage and salary workers (full- and part-time) are developed primarily from the tabulations of data from the administrative records of the State unemployment insurance programs, supplied by the various State employment security agencies. Hired farm workers, government employees, and persons employed in railroad transportation, private educational services, private nonprofit membership organizations, and private households are estimated from a variety of other sources.

The number of active nonfarm proprietors is derived from data tabulated from schedules filed with the IRS in conjunction with the Social Security self-employment tax. The number of farm proprietors is based on USDA and Census of Agriculture data (number of farms adjusted to include partners and exclude corporate and institutional farms).

Statistical Procedures

BEA employment estimates are not derived from surveys designed specifically for the measurement of employment, but rather from information generated from various State and Federal Government programs as well as from other public and private sources. County estimates are designed to sum to independently derived State totals which, in turn, sum to national control totals. Data are used

when available, imputed otherwise. In keeping with this policy, the county series is currently undergoing revision to reflect the conceptual changes first introduced at the national level in January 1976 and carried through to the State totals in late 1977. The revised county employment estimates, which will become available in mid-1978, also incorporate newly available data, which in some cases generated improvements in methodology as well.

Administrative records of the State unemployment insurance programs (form ES-202) provide more than 90 percent of the data underlying the private wage and salary employment estimates. Other sources of data used for estimating employment are County Business Patterns, the various censuses, the U.S. Department of Defense, the U.S. Civil Service Commission, the Association of American Railroads, and the OASI/IRS self-employment file.

Reference

Reports describing methodology and data available from the BEA tapes can be obtained upon request from:

Regional Economic Measurement Division
Bureau of Economic Analysis
U.S. Department of Commerce
Washington, D.C. 20230

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REFERENCES

1. Beale, Calvin L. "A Further Look at Nonmetropolitan Population Growth Since 1970," Amer. J. Agr. Econ., Vol. 58, No. 5, Dec. 1976, pp. 953-58.

2. _____, and Glenn V. Fuguitt. "The New Pattern of Nonmetropolitan Population Change," Univ. of Wis., Ctr. for Demog. and Ecol., CDE Working Paper 75-22, Aug. 1975, 34 pp.

3. Bonnen, James T. "Improving Information on Agriculture and Rural Life," Amer. J. of Agr. Econ., Vol. 57, No. 5, Dec. 1975, pp. 753-763.

4. _____, and others. "Our Obsolete Data Systems: New Directions and Opportunities," Amer. J. Agr. Econ., Vol. 54, No. 5, Dec. 1972, pp. 867-875.

5. Coltrane, Robert, and Nelson Bills. Long Run Population, Employment and Income Trends: Implications for Rural Development. Univ. of W. Va., Agr. Expt. Sta. in coop. with U.S. Dept. Agr., Agr. Econ. Staff Paper, RM 57, Sept. 1974.

6. Gardner, Bruce. "Strategies for Long-Run Investment in Rural, Social, and Economic Statistics," Amer. J. Agr. Econ., Vol. 57, No. 5, Dec. 1975, pp. 892-899.

7. Green, Gloria P. "Comparing Employment Estimates from Household and Payroll Surveys," Monthly Labor Rev., Vol 92, No. 12, Dec. 1969, pp. 9-20.

8. Hines, Fred K., David L. Brown, and John M. Zimmer. Social and Economic Characteristics of the Population in Metro and Nonmetro Counties, 1970. U.S. Dept. Agr., Econ. Res. Serv., Agr. Econ. Rpt. 272.

9. Marshall, Ray. Rural Workers in Rural Labor Markets. Salt Lake City: Olympus Pub. Co., 1974.

10. Office of Management and Budget, Statistical Policy Division. Statistical Services of the United States Government (rev. ed.). U.S. Gov't. Print. Off., 1975.

11. _____ Federal Statistical Directory (25th ed.). U.S. Gov't. Print. Off., 1976.

12. Orcutt, Guy H. Microanalysis of Socioeconomic Systems: A Simulation Study. New York: Harper, 1961.

13. Taeuber, Conrad. "Future Structure of Census Data Relating to Agriculture and Rural People," Amer. J. Agr. Econ., Vol. 53, No. 5, Dec. 1971, p.909.

14. U.S. Department of Commerce, Bureau of the Census. Public Use Samples of Basic Records from the 1970 Census: Description and Technical Documentation. Washington, D.C., 1972.

15. U.S. Department of Labor, Bureau of Labor Statistics. BLS Report No. 463, Series P-23, No. 62, October 1976. "Concepts and Methods Used in Labor Force Statistics Derived From The Current Population Survey," Current Population Reports, Special Series.

16. U.S. Senate Committee on Agriculture and Forestry, 94th Congress. The Economic and Social Condition of Nonmetropolitan America in the 1970's, May 30, 1975.

17. Vlasin, Raymond D., Lawrence W. Libby, and Ronald L. Shelton. "Economic and Social Information for Rural America: Priorities for Immediate Improvement," Amer. J. Agr. Econ., Vol. 57, No. 5, Dec. 1975, pp. 900-909.

18. Wright, Carroll D. and William C. Hunt. History and Growth of the United States Census, Senate Document 194, 56th Congress, 7th Session, U.S. Gov't. Print. Off., 1900, p. 33.

INCOME AND WEALTH DATA AS INDICATORS OF WELL-BEING FOR PEOPLE ENGAGED IN FARMING*

INTRODUCTION

An individual's well-being is a complex phenomenon, highly personal in nature, and determined by the interactions of many factors. Some experts have argued that well-being should be viewed as a "state of mind" which varies directly with the congruence of an individual's expectations and achievements. Of course, well-being is dynamic because expectations and perceptions of achievement change as a result of social experiences.

Proxy variables which have been used to measure well-being include personal income, daily intake of calories, availability of community services, wealth, job satisfaction, amount of leisure time, and longevity of life. In varying degrees, the proxy variables determine, or reflect, the individual's preferences and choice opportunities. If a hypothetical rational individual selects alternative "A" (increased personal income) over alternative "B" (more leisure time), then we conclude that well-being is higher in "A."

This paper is specifically concerned with measuring personal income and wealth of people engaged in farming. There is considerable evidence that these variables influence the preferences and consumption alternatives of an individual, or family, and therefore relate directly to current economic well-being (3). Our focus is not intended to minimize the importance of other dimensions of well-being. However, we have explicitly restricted the scope of the paper to allow development of practical recommendations.

Earlier task forces on farm income estimates made major contributions in suggesting improvements in concepts and data for measuring farm income (4, 15). Their effort focused on achieving compatibility of farm income measures with national income accounts and emphasized farm establishments as opposed to farm households. We concur with the recommendations of the earlier committees and utilize their material as the starting point for the following discussion. This paper extends the earlier reports by making specific suggestions for improving data used to measure the well-being of people engaged in farming. An important task is to develop the appropriate linkages between the farm as a business establishment and the economic well-being of farm people.

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Because of the wide diversity of economic interests and activities among farm people, we feel that existing data are inadequate to monitor their economic well-being, to understand how well-being is redistributed as economic conditions change, and to realistically measure the impact of government programs. However, many of these problems can be overcome with some revision of definitions, collection of additional data, and publication of data using appropriate cross-tabulations. We do not propose to minimize problems of current series by redefining the population to eliminate diversity within the sector. Our approach is to start from a realistic definition of people engaged in farming and recommend practical well-being measures that can be used to understand why specific distortions in the level and distribution of well-being exist by size and type of farm, educational level, age of farm people, and other key variables.

CONCEPTUAL FRAMEWORK

Relationship Between the Farm Business and Households

The conceptual framework utilized in this paper separates the farm business from households associated with farming. The farm business is viewed as an establishment, that is, an economic unit, often at a single physical location, where farming activity is performed. The output of farms, production of grain, livestock, or other farm commodities is either sold to nonfarm establishments or used on the farm (table 1). Inputs used in the production process--seed, fertilizer, feed, etc.--are considered intermediate products consumed. The difference between the total output of farms and the intermediate products consumed, net capital consumption and business taxes and transfers, represents the net value added on farm establishments. Net value added is dispursed to hired farm employees through wages and benefits; owners of farm capital through rents, dividends, and interests; and as a residual, the surplus to farm operators. 1/

Households, on the other hand, are defined as a group of individuals residing together in a single housing unit, be it a house, apartment, or a group of rooms occupied as separate living quarters. Households associated with farming have at least one member who works on and/or receives income from a farm establishment. In all probability, the number of households associated with farming exceeds the number of farm establishments or farms. Households associated with farming establishments can be further subdivided according to the primary role performed by the various individuals within the household. For example, households where the individual is either a hired employee or a full- or part-time, self-employed farmer can be separately identified.

Households of hired farmworkers and farm self-employed are most numerous among households associated with farming and are of most interest from a public policy perspective. Hired farmworkers have historically been viewed

1/ See (1), (15), (16), (17), and (18) for a more detailed discussion of these concepts.

Table 1--Outputs and inputs associated with farming establishments

Debit	Credit
I. Intermediate products consumed	III. Items sold
A. Seed	A. Crops
B. Fertilizer	B. Livestock
C. Fuel	C. Farm-related output
D. Etc.	D. Home consumption
II. Gross value added	IV. Items for own account use
A. Capital consumption	A. Intermediate product consumed
B. Indirect business taxes	B. Fixed capital formation
C. Business transfer payments	C. Changes in inventories
D. Net value added	
1. Employee compensation	
2. Rental payments	
3. Interest and dividend payments	
4. Operator surplus	
a. Corporate profits	
b. Proprietary income	

as disadvantaged; many have low family incomes, a large number are minorities, and all are employed in an industry with relatively high accident rates. We note that considerable data on earnings and other measures of well-being of hired farmworkers are currently published on an annual basis (10). This information is already developed from data collected on a household basis. We endorse this effort, but because the issue is discussed in other papers in this series, we do not examine it further.

The largest single category of households associated with farming are full- or part-time, self-employed farmers. About 90 percent of all farms are operated as sole proprietorships, thus, involve only one farm household. In addition, about 160,000 farms are operated on a partnership or a corporation with 10 or fewer shareholders, and in these cases, two or more households are involved. We propose that personal income and wealth be collected separately for each household in a partnership or family corporation.

The remainder of this report deals with income and wealth data on households of the farm self-employed. Because most farms are of a proprietary nature, farm management decisions are generally made within the context of the household. Most self-employed farm households derive income from both farm and off-farm sources (6, 8, 9). Thus, farm management decisions are

made by a decisionmaking unit which includes both farm and nonfarm activities. Understanding the nature of this household-based decision unit is important for public policy formulation.

"Silent" partners, stockholders, hired farm managers, and similar individuals who have a nonproprietary business interest in farming are specifically excluded from this discussion. However, principles developed here can be generalized to apply to any such group.

Proposed Income and Wealth Measures

We have recommended personal income as a key indicator of the well-being of farm, self-employed households (table 2). Total personal income of this group is composed of proprietor's income from farm establishments, proprietor's income from nonfarm establishments, wages and salaries, rents, interest, dividends, and public and private transfers less contributions to social insurance. Disposable personal income is defined as total personal income less personal tax and nontax payments. Disposable personal income can be allocated to personal consumption expenditures (plus consumer interest payments) or savings. 2/

The definition of personal income used here is the conventional definition used by the Bureau of Economic Analysis, U.S. Department of Commerce. Recent research on the personal distribution of in-kind income and the nature of income dynamics has not been incorporated into the concept of income utilized in this paper. However, our income concept can easily be adjusted to accommodate these factors when appropriate data become readily available. 3/

Wealth is defined as net worth--total tangible assets minus total liabilities. Assets would include the farm business (real estate, machinery, livestock, etc.), nonfarm businesses, household goods, and financial holdings of proprietary farm households (table 3). Claims against these assets, identified by type of asset, would include household equity and secured debts owed to others.

Special attention is directed at capital gains. When current income is defined as the total value of goods and services that can be consumed in a given time period while leaving the real net value of assets constant, it becomes apparent that capital gains as well as money income need to be explicitly considered. However, the importance farmers give to capital gains

2/ Personal disposable income also includes a very small quantity called "personal transfer payments to foreigners."

3/ The Department of Health, Education, and Welfare is currently planning a new Survey of Income and Program Participation (SIPP). This survey, to be made operational in the early 1980's, will provide better information on personal income including income in-kind and participation in public welfare programs. Additional information on SIPP can be obtained from the Office of the Assistant Secretary for Planning and Evaluation, DHEW.

Table 2--Personal income of farm, self-employed households

Debit	Credit
Personal consumption	Proprietor's income from farm establishments
Personal savings	Proprietor's income from nonfarm establishments
Personal taxes	Wages and salaries
	Rents, interest, and dividends
	Public and private transfers
	Less contributions to social insurance

in determining their well-being is unclear. On the one hand, because it may be difficult to "cash out" capital gains in a given year (in some cases, that would mean liquidation of the farming investment as a production unit and, hence, loss of occupation), capital gains may be seen as a less desirable source of income than current earnings. On the other hand, more favorable tax treatment for liquidated capital gains makes it more desirable than cash earnings as an emergency or retirement fund (2). This lack of clarity leads us to suggest that estimates of unrealized capital gains be presented in the context of a wealth statement, distinctly and separately from those of personal income.

A clear picture of the economic position of persons engaged in farming requires data on the level and distribution of personal disposable income and wealth by various categories including type of farming, tenure, economic sales class, time spent farming, age, education, and geographic region. Finally, theory and empirical evidence points to variability of income and wealth as an important dimension of satisfaction.

Accordingly, continuing time series data on individual farms are needed. Such data will allow us to trace the position of specific households over time and will help answer many difficult questions. For example, how many poor people are engaged in farming, and what are their key sociodemographic characteristics? Do poor farm families shift from a low-income to a more favorable income position from one year to the next? How do returns to part-time farming differ by type of farm and geographic region? How are capital gains from real estate distributed by family income level, tenure, and economic sales class? Combined with data on age and education, this information will permit us to monitor the economic well-being of farm families and to evaluate the performance of programs to assist farm people.

Table 3--Balance sheet for farm-operator families

Claims	Assets
Household equity	Total farm assets
Farm	Real estate
Nonfarm	Land
Liabilities	Buildings
Farm	Dwellings
Real estate debt	Non-real estate
Non-real estate debt	Machinery, motor vehicles, and equipment
Accounts payable	Livestock and poultry
Nonfarm	Breeding herds
Real estate debt	Other
Non-real estate debt	Crops stored on and off farms
Accounts payable	Trees and vines
	Supplies and tools
	Financial
	Working deposits
	Accounts receivable
	Total nonfarm assets
	Real estate
	Other physical
	Financial
	Currency
	Savings bonds
	Other stocks and bonds
	Life insurance
	Bank deposits
	Other financial

Income

ESCS

The Economics, Statistics, and Cooperatives Service publishes two series of annual data which depict the income of people associated with farming (14). The first is the total income of farm-operator families distributed by value of farm sales (table 4). Total family income includes realized net income from farming and off-farm income. Off-farm income respresents money income from wages and salaries earned on farms operated by others and sources other than farming. Realized net farm income reflects cash receipts including government payments plus value of farm perquisites less cash operating expenses, depreciation, and payments to nonfarm landlords plus net receipts from customwork for other farmers, sale of recreational services, and other farm-related activities. Thus, the concept of income differs somewhat by source. No deductions are made for contributions to social insurance or personal tax and nontax payments. Published data presume the one farm-one operator family identity and show the average income per farm by sales class. Data by sales class are actually compiled on an establishment basis rather than a household basis, and some farming establishments may support more than one household. The estimates are not distributed by size-of-family income. Thus, the number and proportion of all farm-operator families with low-income problems cannot be identified. Some households operating farms with large gross sales of farm products have low personal income while some households operating farms with small sales of farm products have high personal income because of off-farm earnings (6). This data series does not allow an investigation of the low-income issue.

The second income series published by the Economics, Statistics, and Cooperatives Service is the total personal income and total disposable personal income of the farm population (table 5). This series reflects the personal income of farm residents from farming activity and from nonfarm sources. The income of nonresident farm operators is excluded, while farm residents who may have no attachment to the farming sector other than as a place to live are included. Thus, major commodity policies do not affect some of the "farm" population as defined in the published series. Conversely, the income of some major actors in the farm sector, such as nonresident farm operators, are completely excluded from coverage. Distributions are not made by size of personal income; thus, again, it is impossible to identify residents with low incomes. Furthermore, because of the differences in population coverage, it is not possible to attend these data with appropriate ESCS estimates of capital gains and wealth.

The personal income series is highly dependent on data collected in the Census of Agriculture. The most recent benchmark data are the 1970 Special Financial Survey of Agriculture conducted by the Bureau of the Census in connection with the 1969 Census of Agriculture. Prior to that, the 1965 Sample Survey of Agriculture, again conducted by the Bureau of the Census, was used to adjust the current series. These surveys provide detailed information on family income by source with particular detail on off-farm

Table 4--Income per farm operator family by major source and by value of sales classes, 1960-76

Year	Farms with sales: $100,000 and over	$40,000 to $99,999	$20,000 to $39,999	$10,000 to $19,999	$5,000 to $9,999	$2,500 to $4,999	Less than $2,500	All farms
				Dollars				
				Realized net income 1/				
1960	30,826	13,812	8,080	5,095	3,212	1,931	806	4,806
1961	31,730	14,588	8,431	5,317	3,339	1,997	852	5,058
1962	30,275	14,321	8,268	5,258	3,240	1,918	844	5,000
1963	29,516	14,018	8,045	5,139	3,109	1,816	827	4,910
1964	31,594	12,562	8,435	5,443	3,250	1,886	875	5,272
1965	33,084	15,136	8,578	5,527	3,211	1,830	899	5,533
1966	44,581	18,127	10,134	6,045	3,361	1,895	936	4,312
1967	30,094	15,147	8,823	5,328	3,006	1,678	872	5,695
1968	32,178	15,726	9,353	5,532	3,106	1,695	894	5,972
1969	42,136	17,547	10,561	5,961	3,300	1,722	927	4,733
1970	41,124	17,034	10,305	5,800	3,220	1,692	1,018	4,788
1971	36,158	15,618	9,522	5,345	2,979	1,566	1,059	4,550
1972	55,049	18,966	11,163	6,286	3,509	1,904	1,297	6,204
1973	93,748	23,539	12,972	7,119	3,970	2,178	1,575	10,529
1974	82,413	20,617	11,409	6,170	3,476	1,915	1,644	9,801
1975	55,916	16,633	9,623	5,224	2,987	1,684	1,727	7,410
1976	55,716	16,558	9,622	5,248	3,030	1,725	1,921	7,885
				Off-farm income				
1960	NA	NA	1,678	1,258	1,574	1,848	2,732	2,140
1961	NA	NA	1,757	1,414	1,838	2,113	3,039	2,396
1962	NA	NA	1,894	1,604	2,141	2,402	3,377	2,773
1963	NA	NA	2,169	1,870	2,542	2,784	3,845	3,085
1964	NA	NA	2,287	2,058	2,831	3,068	4,180	3,366
1965	7,278	3,680	2,507	2,319	3,232	3,471	4,713	3,792
1966	7,209	3,699	2,694	2,717	3,723	4,079	5,312	4,282
1967	7,140	3,662	2,809	3,044	4,109	4,560	5,661	4,584
1968	7,400	3,799	3,023	3,446	4,592	5,137	6,212	5,036
1969	7,490	3,869	3,215	3,860	5,094	5,752	6,963	5,539
1970	7,596	3,943	3,350	4,165	5,419	6,151	7,391	5,874
1971	8,317	4,348	3,665	4,541	5,892	6,680	8,191	6,456
1972	8,988	4,667	3,944	4,873	6,322	7,167	9,380	7,160
1973	9,406	4,906	4,175	5,205	6,801	7,740	11,824	8,335
1974	10,587	5,520	4,662	5,792	7,574	8,607	13,280	9,330
1975	12,007	6,229	5,199	6,397	8,283	9,400	14,223	10,148
1976	13,310	6,906	5,762	7,060	9,124	10,342	15,630	11,174
				Total income including non-money income from farm food and housing 1/				
1960	NA	NA	9,758	6,353	4,786	3,779	3,538	4,946
1961	NA	NA	10,188	6,731	5,177	4,110	3,891	5,434
1962	NA	NA	10,162	6,862	5,381	4,320	4,221	5,782
1963	NA	NA	10,214	7,009	5,651	4,600	4,672	6,204
1964	NA	NA	10,722	7,501	6,081	4,954	5,055	6,638
1965	40,362	18,816	11,085	7,846	6,443	5,301	5,612	7,325
1966	51,790	21,826	12,828	8,762	7,084	5,974	6,248	8,574
1967	37,234	18,809	11,632	8,372	7,115	6,238	6,533	8,279
1968	39,578	19,525	12,376	8,978	7,698	6,832	7,106	9,008
1969	49,626	21,416	13,776	9,821	8,394	7,474	7,890	10,272
1970	48,720	20,977	13,655	9,965	8,639	7,843	8,409	10,662
1971	44,475	19,966	13,187	9,886	8,871	8,246	9,250	11,006
1972	64,037	23,633	15,107	11,159	9,831	9,071	10,677	13,364
1973	103,154	28,445	17,147	12,324	10,771	9,918	13,399	18,864
1974	93,000	26,137	16,071	11,962	11,050	10,522	14,924	19,131
1975	67,923	22,862	14,822	11,621	11,270	11,084	15,950	17,558
1976	69,026	23,464	15,384	12,308	12,154	12,067	17,551	19,059

1/ Includes Government payments.
NA = Not available.

Table 5--Personal income and disposable personal income of the farm population, 1934-77 1/

Year	Total net income of farm operators, including Government payments 1/	Less: Net income of nonresident operators	Plus: Wages and other labor income of farm residence workers	Less: Contributions of farm residence operators and workers to social insurance	Equals: Personal income of farm population from farm sources 2/	Personal income of farm population from nonfarm sources 3/	Total personal income of farm population, all sources	Less: Personal tax and nontax payments 4/	Equals: Disposable personal income of farm population
1934	2,923	224	489	---	3,188	2,186	5,374	94	5,280
1935	5,278	412	557	---	5,423	2,307	7,730	106	7,624
1936	4,308	340	624	---	4,592	2,640	7,232	122	7,110
1937	6,005	486	709	---	6,228	2,748	8,976	126	8,850
1938	4,361	358	699	---	4,702	2,475	7,177	138	7,039
1939	4,414	366	703	---	4,751	2,610	7,361	128	7,233
1940	4,482	376	732	---	4,838	2,759	7,597	118	7,479
1941	6,490	552	885	---	6,823	3,257	10,080	123	9,957
1942	9,853	857	1,153	---	10,149	3,941	14,090	213	13,877
1943	11,736	1,045	1,429	---	12,120	4,361	16,481	529	15,952
1944	11,705	1,053	1,549	---	12,201	4,435	16,636	991	15,645
1945	12,312	1,120	1,615	---	12,807	4,405	17,212	1,224	15,983
1946	15,068	1,386	1,793	---	15,475	4,551	20,026	1,180	18,846
1947	15,354	1,428	1,910	---	15,836	5,297	21,133	1,143	19,990
1948	17,664	1,678	1,991	---	17,977	5,815	23,792	1,530	22,262
1949	12,780	1,240	1,744	---	13,284	6,192	19,476	1,122	18,354
1950	13,648	1,338	1,772	---	14,082	6,263	20,345	982	19,363
1951	15,934	1,641	1,866	11	16,148	6,511	22,659	1,027	21,632
1952	14,961	1,616	1,945	11	15,279	6,726	22,005	1,357	20,648
1953	12,980	1,480	1,778	12	13,266	6,437	19,703	1,537	18,166
1954	12,373	1,472	1,521	17	12,405	5,934	18,339	1,589	16,750
1955	11,305	1,402	1,470	118	11,255	6,197	17,452	1,269	16,183
1956	11,254	1,452	1,401	138	11,065	6,584	17,649	1,235	16,414
1957	11,085	1,485	1,391	148	10,843	6,616	17,459	1,281	16,178
1958	13,168	1,844	1,359	155	12,528	6,681	19,209	1,276	17,933
1959	10,723	1,564	1,421	161	10,409	7,124	17,533	1,420	16,113
1960	11,518	1,693	1,493	192	11,126	7,236	18,362	1,389	16,973
1961	11,957	1,770	1,423	200	11,410	7,637	19,047	1,520	17,527
1962	12,064	1,798	1,336	207	11,395	8,342	19,737	1,667	18,070
1963	11,770	1,766	1,234	226	11,012	8,958	19,970	1,731	18,239
1964	10,492	1,584	1,331	227	10,012	9,743	19,755	1,693	18,062
1965	12,899	1,961	1,261	231	11,968	10,627	22,595	1,679	20,916
1966	13,960	2,136	1,094	310	12,608	11,205	23,813	1,858	21,955
1967	12,339	1,900	987	309	11,117	11,737	22,854	1,923	20,931
1968	12,322	1,910	1,200	341	11,271	12,828	24,099	2,155	21,944
1969	14,293	2,230	1,276	412	12,927	13,929	26,856	2,818	24,038
1970	14,151	2,208	1,422	389	12,976	14,404	27,380	3,002	24,378
1971	14,633	2,283	1,463	373	13,440	15,274	28,714	3,172	25,542
1972	18,665	2,912	1,444	435	16,762	17,643	34,405	3,433	30,972
1973	33,349	5,202	1,538	654	29,031	19,544	48,575	4,392	44,183
1974	26,130	4,076	1,776	686	23,144	21,572	44,716	4,810	39,906
1975	24,258	3,784	1,749	703	21,520	22,776	44,296	4,476	39,820
1976	20,914	3,122	1,605	711	17,786	24,166	41,952	4,665	37,287

1/ From table 2H. Total returns from farming operations to farm operators for their capital, labor and management, after deduction of farm production expenses (there is no allowance in the item farm production expenses for a return on investment of farm capital). 2/ Includes returns from farming operations to resident farm operators for their capital, labor and management, after deduction of farm production expenses (there is no allowance in the item farm production expenses for a return on investment of farm capital). Also includes farm wages and other labor income received by hired farm-resident workers. 3/ Includes all income received by farm residents from nonfarm sources such as wages & salaries from nonfarm employment, non farm business and professional income, rents from nonfarm real estate, dividends, interest, royalties, unemployment compensation and Social Security payments. 4/ Includes all personal tax and nontax payments by the farm population to Federal, State and local governments.

income. In addition, this data source is also used to make estimates of the number of nonresident operators. Between survey years, the series is extrapolated using per capita estimates of various components of personal income provided by the Bureau of Economic Analysis, U.S. Department of Commerce. Certain assumptions are made about how the farm population is sharing in the increases or decreases in these components of personal income between survey years.

Census Bureau

The Bureau of the Census provides data by measuring the income of people who reside on farms and of persons and families whose head is a farmer or farm manager by occupation. 4/ Occupation is defined as the job held longest during the survey week or income year. The decennial Census of Population provides detailed income and demographic data on these same groups. In addition, the annual March Current Population Survey (12) collects income and demographic information for a small sample of farm families. The Economics, Statistics, and Cooperatives Service, in cooperation with the Bureau of the Census, publishes an annual report on the economic and social characteristics of the farm population using data from the Current Population Survey (12). This activity is being expanded to include information on the farm self-employed. The concept of income used here covers usual money income received before payments of personal income taxes, Social Security, union dues, etc. Nonmoney income and transfers, such as housing, food and fuel produced on the farm and consumed by the household, Food Stamps, etc., are excluded. Data are tabulated by size-of-family income, type of family, and other demographic characteristics. Per capita total money income estimates provided by population data are usually lower than that estimated by ESCS, even after adjusting for definitional differences (table 6). It is not unusual for estimates from survey income data to be less than those provided by more aggregated approaches, particularly self-employment income, income from capital, and cash transfers. Respondents often forget or refuse to report some types of income. And, respondents seldom reveal the method used to compute the self-employment income reported on surveys. A major weakness of population data for use in developing well-being measures is the lack of information on the farm business itself.

Internal Revenue Service

The Internal Revenue Service annually reports summary income data from a sampling of returns filing Schedule F (Form 1040), Farm Income and Expenses, and/or Form 4835, Farm Rental Income and Expenses (5). Data can be obtained on type of farm, gross business receipts, farm and off-farm income, and other information commonly provided on Federal income tax forms. Total farm profit reported on Federal income tax returns is less than net farm income reported by ESCS even after adjusting for definitional differences (table 7). A comparison of 1972 tax return data with farm income data provided by ESCS

4/ The concept of a farm operator who both works on and has equity in the farm business is unique to the Census of Agriculture and the agricultural establishment.

Table 6--Per capita money income of farm population estimated from Current Population Survey and using Farm Income Statistics

Year	Per capita money income		Ratio CPS/FIS
	CPS	FIS 1/	
1975	3,514	3,831	.92
1974	3,587	4,172	.85
1973	3,489	4,208	.83
1972	2,890	2,974	.97
1971	2,518	2,430	1.04
1970	2,054	2,370	.87

1/ Total personal income of the farm population, less resident value of farm products consumed, less gross resident rental value of farm dwelling, less resident value of change in farm inventories, plus contributions to social insurance from farm sources, less resident value of depreciation adjustment. See footnote 1, table 7 for further explanation.

Source: U.S. Bureau of the Census, "Money Income of Families and Persons in the United States," Current Population Reports, Series P-60, and U.S. Department of Agriculture, "Farm Income Statistics."

showed that estimates of gross business or farm receipts between the two sources were surprisingly close but that expenses differed considerably. Differences in accounting procedures, especially special farm tax provisions, as well as the concept of a farm contribute to the apparent discrepancy. Tax return data are quite useful for providing insights into the farm business economy and for tax policy research, but there are difficulties in using tax return data for obtaining information on farm operators. The unit of observation is the tax return. The filing unit, in the case of sole proprietorship, does not reflect the Census concept of farm family, farmer or farm manager occupation, or farm operator. While information is available on the number of dependents, no data are provided on their characteristics. At best, tax

Table 7--Farm income depicted by ESCS and IRS

Year	ESCS 1/	IRS 2/	Ratio
	Adjusted farm income	Net profit from farms	IRS/ESCS
1973	22.1	3/ 9.8	.44
1972	11.1	5.7	.51
1971	7.0	3.0	.43
1970	8.3	3.3	.40

1/ Most farm taxpayers utilize cash accounting for tax purposes. Thus, ESCS estimates were adjusted to a tax reporting concept. Farm income is defined as realized net farm income including government payments less the value of home-produced food and fuel and the rental value of farm housing. ESCS estimates depreciation and other capital consumption on a replacement cost basis. Most farm taxpayers report depreciation on a book value basis. ESCS farm income was adjusted to reflect book value depreciation.

2/ Net farm profit, less losses to sole proprietorship and partnerships and net income, less deficit of small business corporations.

3/ Excludes corporate data. These data not available for 1973.

Source: Internal Revenue Service, Statistics of Income, Business Income Tax Return, U.S. Government Printing Office, Washington, D.C., 1973, 1974, 1975.

return data relate only to people with farm income. Only persons who file Federal income tax returns are included. Thus, some very low-income units with no Federal income tax liability are excluded from the sample.

Wealth

The only continuing statement of farm wealth is found in the ESCS publication, Balance Sheet of the Farm Sector (BSFS) (13). BSFS is a unique publication; no other sector of the U.S. economy has asset and claim data compiled in a similar fashion. Its principal purpose is to provide informa-

tion on the financial structure of the farming sector. Major categories of farm-related physical and financial assets are annually equated with farm liabilities and the equity of farm operators and nonoperator landlords and investors. The farming sector is viewed in the BSFS as a "national family farm." Aggregates are distributed by farm sales class. Classification by other socioeconomic variables is not possible. Recent extensions to the basic balance sheet include estimates of capital gains on assets and the creation of an account which attempts to explain the means by which farmers pay for acquired assets (7, 11).

In its present form, BSFS provides an incomplete picture for wealth of farm-operator families. There are four shortcomings which largely result from data deficiencies. The first problem area involves the accuracy and completeness of the coverage of farm business assets. Currently, four types of farm assets are not included in the balance sheet: farmer-owned non-CCC crop inventories stored off farms; purchased supplies of feed, fuel, fertilizer, and pesticides; inventories of small tools and machines; and farm business accounts receivable. Several other assets are covered but are improperly defined. For example, animals held for breeding purposes are presently included in livestock held-for-sale inventories. Although this does not greatly reduce or increase farm asset levels, it distorts the picture of capital composition. Home-produced capital construction, land improvements, and perennial crop development are also improperly defined. Rather than being explicitly measured as capital additions, they are captured in the year to year capital gains in the value of land and buildings. Research discovering the extent of these errors and then correcting them has begun but has been hampered by a shortage of data.

The second general problem area is the minimal coverage of household and nonfarm business assets and related liabilities. The present system includes operators' dwellings, time and demand deposits in commercial banks, currency, savings bonds, household equipment and furnishings, and equity in cooperative enterprises. However, many farm operators own other assets (and related liabilities) such as life insurance, interests in nonfarm businesses and properties, corporate and public stocks and bonds, and cash deposits in nonbank institutions. Since there is very little information on these nonfarm assets, it is difficult to determine how much their absence biases the overall wealth statement. However, surveys taken during the early and middle 1960's suggest that from 10 to 20 percent of the average farm-operator family's net worth may be accounted for by missing household and nonfarm business assets. If this is true, then the omission is far too important to ignore.

The third problem in the BSFS system is the inability to completely separate the asset and debt ownership between farm operators and nonoperator landlords and investors. The division is made for land and building ownership, but all other assets and debts are assumed to be owned by operators. Finally, the wealth information presented in the BSFS cannot be directly related to similar income information provided by ESCS without modifications due mainly to differences in population coverage. Nor can wealth be distributed by size-of-family income or other socioeconomic variables.

Estimates of farm assets and liabilities are largely derived from Census of Agriculture financial surveys, the most recent being the 1970 Special Financial Survey. Limited data are available from the 1974 Census of Agriculture. Additional information on farm assets and debts was obtained on the 1975 Farm Production Expenditures Survey conducted by ESCS. Financial asset data are based on periodic surveys and reports of farm financial institutions, primarily commercial banks that are members of the Federal Reserve System and located in agricultural counties. The most recent information on nonfarm asset and debt ownership is from the 1975 Farm Production Expenditures Survey. Prior to that, the 1966 Pesticide and General Farm Survey provided the basic benchmarks.

As stated earlier, the BSFS is the only continuing wealth statement for farm families. Comparable alternative estimates are not available. Information from all the periodic national surveys are incorporated directly. Thus far, information to improve the obvious shortcomings of this series has not been available.

CONCLUDING REMARKS

The growing complexity of the farm household-farm establishment relationship will increase the need for data which allow us to separate and then link the economic activities of each. This ability to link the household and the farm firm is required because of the continued prevalence of proprietary-type establishments in the sector. The capacity to separately identify (or more correctly, identify in addition) household from farm activities is required because of the increased nonfarm economic activities of farm household members. No longer can we equate the financial condition of the household with that of the farm business.

The one farm-one family is no longer realistic. A larger share of farm production is taking place on family partnerships and family corporations. Hence, an increased percentage of the larger establishments are supporting more than one family.

Presently, two Federal agencies are charged with the responsibility of obtaining information on farmers: the Agricultural Division, Bureau of the Census, and the Economics, Statistics, and Cooperatives Service, USDA. While the specific missions of the two agencies differ, both devote considerable time to developing commodity production data and some economic data for the farm sector. However, the information on total income and wealth is inadequate, and the prospect for substantial improvement is not bright.

Income

It seems unlikely that large and expansive agricultural surveys to collect farm and nonfarm income information will be possible. We are much more likely to get periodic benchmark agricultural data supplemented by information from annual "population type" surveys to serve as income "movers" between agricultural Census years. Our best potential source of benchmark

data is the periodic Survey of Farm Finance which follows the regular Census of Agriculture. In the past, this survey has provided information on farm and off-farm income. However, in 1974, the Census of Agriculture collected no off-farm income information for farms with less than $2,500 in gross farm sales. Yet, this group received nearly 40 percent of the total off-farm income.

The Farm Finance Survey following the 1979 Census of Agriculture offers the next chance for real improvement in income data. If this survey is modified to accommodate the concepts developed above, it would provide valuable input into creation of benchmark linkages between farm establishments and associated households.

More extensive use should be made of existing "population type" household surveys to provide up-to-date income information between Census years. The March Current Population Survey estimates that approximately 3 million families and unrelated individuals have farm self-employment income annually. Although the CPS data does not exactly match with Agricultural Census data, the addition of two questions to the CPS questionnaire--type of farm and amount of gross farm sales--should permit a useful merging of information from the two data systems.

Wealth

If prospects for improved income data can be rated as fair, prospects for increased information on the stock and growth of nonfarm business and household wealth are poor. Presently, there is no regular source for data of this type. Good benchmark information could be obtained via the financial survey following the 1979 Census of Agriculture. However, past experience suggests that Bureau of the Census has little interest in collecting such information. Another potential source is the USDA's annual Farm Production Expenditure Survey. If properly structured, this survey could provide valuable information on either an annual or benchmark basis. However, after an initial effort in 1975, subsequent editors of the survey have omitted wealth questions.

We can expect little support from other ongoing surveys. Presently, the annual population surveys, e.g., CPS, do not collect wealth data, and there is small liklihood that they will begin a large effort for such a small segment of the population. While plans for the Survey of Income and Program Participation do include the collection of wealth data, it is too early to evaluate its usefulness for this purpose.

In summary, only a very strong demand will elicit the response required to gather sufficiently complete and sufficiently frequent data for measuring farmers' personal wealth situation.

RECOMMENDATIONS

1. Because of the unique character of the farming sector, special effort must be directed toward developing data linkages between farming establishments and households associated with farming. Periodic benchmark information can best be developed by either the Agriculture Division, Bureau of the Census, or the Economics, Statistics, and Cooperatives Service using special surveys such as the Survey of Agricultural Finance. Both Federal agencies collect detailed data on farms, but neither has utilized the household as the unit of observation for collecting information on well-being. We recommend that this responsibility be clearly assigned either to the Bureau of the Census or the Economics, Statistics, and Cooperatives Service.

2. The farm resident population is no longer as uniquely associated with farming activity as it once was. At the same time, many nonfarm residents receive some farm income or are occupationally linked to farming. We recommend that information currently compiled on a farm residence basis be discontinued and replaced with economic and demographic information on people with farm self-employment income who are occupationally linked to farming.

3. The March Current Population Survey, as well as other household-based surveys, have a potential for providing data on the well-being of farm-related households. The USDA has, to date, made limited use of such data sources. We recommend that a pilot study be immediately undertaken to determine the feasibility of developing a periodic report on the well-being of farm, self-employed households. This study should include an evaluation of sample adequacy, possible alternative distributions, needed questionnaires to accommodate linkages to the farm establishment, and potential costs of modifying questionnaires or sampling procedures. If such a report proves feasible, we recommend that the USDA implement such an activity to essentially replace current series on personal income of the farm population and income of farm-operator families.

4. The definition of farm income, particularly that reported in cross-sectional surveys, continues to be a perplexing problem. Alternative sources of farm income estimates continue to differ substantially. We recommend that the USDA undertake a study attempting to reconcile alternative farm income estimates and to develop a questionnaire design which provides the best possible estimate of farm income for measuring well-being.

5. Estimates of the stocks and growth of farmers' household and nonfarm business net worth are practically nonexistent. We recommend the suggested income surveys be complemented with requests for adequate wealth information.

REFERENCES

(1) Carlin, Thomas A., and Charles R. Handy
"Concepts of the Agricultural Economy and Economic Accounting," Amer. Jour. of Agr. Econ., Vol. 56, No. 5, pp. 964-975, Dec. 1974.

(2) _____, and Edward I. Reinsel
"Combining Income and Wealth: An Analysis of Farm Family 'Well-Being'," Amer. Jour. of Agr. Econ., Vol. 55, No. 1, Feb. 1973.

(3) Harper, Wilmer
The Role of Income in Perceived Quality of Life of the Rural Populace. Unpublished Ph.D. Dissertation. Dept. of Agr. Econ., Oklahoma State Univ., Stillwater, 1977.

(4) Hildreth, R. J.
Report of Task Force on Farm Income Estimates. Unpublished Manuscript. Econ. Res. Serv., U.S. Dept. of Agr., July 1972.

(5) Internal Revenue Service
"Business Income Tax Returns," Statistics of Income, Government Printing Office, Washington, D.C., 1973 through 1977.

(6) Larson, Donald K.
"Economic Class as a Measure of Farmers' Welfare," Amer. Jour. of Agr. Econ., Vol. 57, No. 4, pp. 658-664, 1975.

(7) Penson, John B., Jr.
"Toward an Aggregative Measure of Savings and Capital Finance for U.S. Farm Operator Families," Amer. Jour. of Agr. Econ., Vol. 59, No. 1, pp. 49-60, Feb. 1977.

(8) Reinsel, Edward I.
People With Farm Earnings: Sources and Distribution of Income. ERS-498. Econ. Res. Serv., U.S. Dept. of Agr., Mar. 1972.

(9) _____
Farm and Off-Farm Income on Federal Tax Returns. ERS-383. Econ. Res. Serv., U.S. Dept. of Agr., Aug. 1968.

(10) Rowe, Gene, and Leslie Whitener Smith
The Hired Farm Working Force. AER-355. Econ. Res. Serv., U.S. Dept. of Agr., Dec. 1976.

(11) Simunek, Richard W.
"National Farm Capital Accounts," Amer. Jour. of Agr. Econ., Vol. 58, No. 3, pp. 532-542, Aug. 1976.

(12) U.S. Bureau of the Census
"Money Income in 1973 of Families and Persons in the United States," Curr. Pop. Rpts., Series P-60, No. 97, U.S. Government Printing Office, Washington, D.C., 1975.

(13) U.S. Department of Agriculture
Balance Sheet of the Farming Sector. Agr. Info. Bul. 389. Econ. Res. Serv., U.S. Dept. of Agr., Sept. 1975.

(14) _____
Farm Income Statistics. Stat. Bul. 557. Econ. Res. Serv., U.S. Dept. of Agr., July 1976.

(15) Weeks, Eldon et al.
Farm Income and Capital Accounting - Findings and Recommendations of a 1972 ERS Task Force. Unpublished Manuscript. Econ. Res. Serv., U.S. Dept. of Agr., July 1972.

(16) _____
Economic Accounts for the Food and Fiber Sector, Part I: The Food and Fiber Sector--Recommended Concept and Definition. Unpublished NEAD Working Paper. Econ., Stat., and Coop. Serv., U.S. Dept. of Agr., Feb. 1978.

(17) _____
Economic Accounts for the Food and Fiber Sector, Part II: Basic Economic Accounts for the Food and Fiber Sector. Unpublished NEAD Working Paper. Econ., Stat., and Coop. Serv., U.S. Dept. of Agr., expected Feb. 1978.

(18) _____, and Thomas Browning
Economic Accounts for the Food and Fiber Sector, Part III: The Farming Subsector--Additional Dimensions. Unpublished NEAD Working Paper. Econ., Stat., and Coop. Serv., U.S. Dept. of Agr., expected Mar. 1978.

TOWARD THE DEFINITION AND MEASUREMENT OF FARM EMPLOYMENT*

INTRODUCTION

The Need for Farm Labor Data

Of all the types of data collected by an advanced society, employment related data have special significance and status. Workers are essential to any and all types of economic activity. But because workers are people, the importance of their employment, compensation and welfare transcends that of other factors of production. Employment data provide one of our most important measures for monitoring the performance of the economic system.

The agricultural industry and work force have posed some particularly difficult problems for those attempting to collect, disseminate and use agricultural employment data, to wit:

- the geographical dispersion of the industry coupled with the large number of potential reporting units.
- large seasonal fluctuations in certain types of agricultural employment and wide variation in these seasonal peaks among various commodities.
- the high incidence of casual labor market participants and multiple jobholders in the agricultural work force.
- the high incidence of self-employment and unpaid family employment, which is inherently difficult to identify, define and measure.
- split responsibility for agricultural employment data collection among USDA and USDL.

Nevertheless, questions of who does the work on the nation's farms, of their income and welfare status, and a multitude of related matters are of more than passing interest in contemporary American life. The questions that arise are as diverse as the perspectives and purposes of those who raise them. Some come with emergencies such as the Florida freeze or the California drought. These unexpected needs to know about farm labor come along frequently enough to add considerably to the weight of sustained and enduring needs. Emergency

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or not, questions far outnumber reliable answers. In consequence, ignorance, myth and bias abound and much too frequently they, rather than knowledge, are the foundation of conclusions and actions.

Only to a limited extent can producers of data on farm employment depend upon and be guided by expressions of need by users. There is no steady clientele of users comparable to that, for example, for commodity markets. Many of the complaints encountered on data inadequacy are related to local and specific situations to which continuing national series could not be obligated. Furthermore, data on farm employment are used mainly by persons who have limited sophistication; for them, farm employment data are in the category of goods for which supply creates its own demand; these users seldom have much of a concept of what they need until they discover what they can get. Consequently, our views of what should be done are considerably influenced by our own perceptions of the value of knowledge for its own sake, which include expectations of usefulness. Within our perceptions of usefulness, we include public policy formation and research. Examples of policy questions related to farm employment seem omnipresent. A list of recent and current examples would include occupational health and safety, migrant and seasonal public employment service policy, labor organization and collective bargaining, income and wage policies, including unemployment insurance and wage and hour legislation, legal and illegal alien worker policy, and effects of technological innovation on population movements and welfare obligations. However, we acknowledge that national series are not likely to have the comprehensiveness or detail to completely meet the needs of either policymaker or researchers. Yet, a reliable, timely set of general estimates should afford for each a background with which orders of magnitude and problem definitions can be established.

The Objectives of National Statistical Series

We believe there are two categories of obligation that national statistical reporting of farm employment and wages should try to meet:

1. Basic data should be supplied that are based upon definitions and measurement techiques sufficiently homogeneous with those used in non-farm reporting so that the results will be comparable, additive, and taken together, comprehensive.

2. Farm employment has exceptional characteristics that need to be measured and reported as fully and accurately as possible. These include the large proportions of seasonal and migratory workers, many of whom would be missed in a standard occupational survey and not less importantly, the farm work done by operators and members of their families, many of whom are multiple job holders. Notwithstanding the great changes that have occurred in technology and farm enterprise, self-employment on either a full-time or part-time basis is still the principal source of labor supply for the nation's farms. Inasmuch as many legislators and policy makers speak as though the terms migrant and farmworker were synonymous there is a continuing need to debunk these fallacies.

Interest in trends is at least equal to that in specific contemporary situations The recent reversal in population growth patterns in rural areas, and the apparent recent leveling of hired agricultural employment are but two examples of the rapidity with which yesterday's planning premise has become today's historical phenomenon. Policymakers, for obvious reasons, are keenly interested in projections. This interest, and the likelihood of yet more change to come, impose further constraints upon the design of continuing statistical series. Beyond temporal homogeneity, these series need to have reasonable prospects of survival. Attainment of these needs is made the more likely by avoiding massiveness and attachment to program operations--the former brings vulnerability to cost surveillance and the latter vulnerability to ephermerality of programs. These considerations carry implications of modesty on how far it is practical to recommend going to alleviate data deficiencies we know to exist. We judge that consistency of measurement over time and minimizing uncertainties of continuance are worth trade-offs against ambitious striving for magnitude and detail.

Scope and Limitations of the Report

Observations such as those on the prceeding pages could be the prelude to proposals for new and grand statistical schemes. That is not our intent. There are several practical limitations to how detailed and accurate farm labor statistics can be. Given the multifold heterogeneities of work force and employment circumstances that are embraced in American agriculture, it is quite impractical to dwell upon the prospects of continuing statistical series that go beyond reporting farm employment, unemployment, wage rates and earnings in the most general manner. Specific situations and their data needs will usually have to be dealt with by ad hoc or locally sponsored reporting or survey arrangements. We have proceeded with the task of this committee under the assumption that the present data gathering vehicles and general levels of resource commitment are indicative of the realistic limitations to this activity. Thus the task we have taken upon ourselves is how to sharpen concepts, enhance accuracy and expand knowledge of farm employment and the work force without significant increase in costs.

In this report we have focused on the relatively few concepts and methodological issues dealing with the definitions and measurement of farm employment and the farm work force and the major sources through which these statistics are generated. We have done so because we believe these statistics to be of fundamental importance and these series to be the most efficacious means for producing them. We have not, for example, discussed farm wage rates or earnings data, dealt at length with the identification and measurement of migratory work or addressed the estimation or forecasting of farm labor supply and demand. We recognize these and other topics as legitimate present or potential subjects of farm labor statistical series, but we are conviced that the basic employment and labor force concepts treated here must be implemented before substantial progress can be made on other labor force data.

We have elected not to undertake the building of an inventory of proposals on what we believe would be useful, to stand apart from proposals on the means of implementation. As we propose no new series but only modifications in present ones, substantive discussion will in each instance center on the particular series under consideration.

II. THE PRINCIPAL AGRICULTURAL EMPLOYMENT DATA SOURCES

Sources of national labor force data fall into two classes, those based on surveys of households and those based on surveys of farms or establishments. Establishment surveys generally provide data on the characteristics of jobs while household surveys generally provide data on the characteristics of workers. Unfortunately, it has seldom proved possible to link the two although much important manpower policy requires essentially that kind of information.

Household versus Establishment Surveys

Both household and worker surveys can produce statistics which may be labelled "farm employment" statistics. However, the definitions applied and the nature of the survey can produce vastly different numbers. Instances of confusions and misinterpretation of these statistics, particularly with respect to agriculture, are sufficiently common that an explanation of significance of some of the variation in statistics from different sources seems appropriate.

Business firms are frequently engaged in more than one activity. Thus a single firm may be engaged in producing agricultural commodities (i.e., farming) and in other activities such as processing or selling those commodities, or in an activity totally unrelated to farming. If one is surveying and classifying business firms, two choices exist in such instances, either to count the firm once and classify it in the activity or industry in which it is chiefly engaged, or to count it several times, once in each industry in which it is engaged.

Obviously the first choice will produce statistics which underestimate the number of firms engaged in a particular industry, since those firms chiefly engaged in other businesses will not be counted, even though their "secondary" activities may be very substantial. The second choice will overestimate the aggregate number of firms, since those in several activities will be counted more than once.

If one is conducting a survey or census of business firms, and enumerating characteristics of these firms, such as employment or payroll, then the enumerated characteristics will be classified according to the chief activity of the firm, or the enumerator must somehow divide up the employment, payroll, or other item, among the activities of the firm. There may be no logically compelling basis upon which to make this separation.

One example of the difficulties that can arise results where agricultural employment data are collected by one agency and total population employment data are collected by another. In reporting employment data, the agency collecting data from all firms may report agricultural employment as the employment of firms whose chief activity is agriculture. The agency surveying agricultural employment only may include in its survey population all firms engaged in agriculture, irrespective of their other activities, enumerating their agricultural employment. Both sources can yield estimates of "agricultural employment"; the first would actually be estimating the employment of (chiefly)agri-

cultural firms, while the second would be estimating the agricultural employment of all firms. Since there are firms that have agricultural employment, but whose chief activity is other than agriculture, the latter enumeration is likely to produce larger estimates of agricultural employment than the former.

A similar but more severe problem exists with workers. Workers commonly may be engaged in more than one activity, either for the same employer or by holding more than one job. In measuring employment, the worker might be counted only once, presumably in the activity to which he devoted the most time, or several times, once in each activity in which he is engaged. If he works for more than one employer, and the employment count is made by contacting employers, then he will be counted more than once, even though he is counted only once for each employer. If the count is made by contacting workers, he will be counted only once, but his occupational and industrial classification will reflect the activity in which he spends the greatest amount of time. When workers are counted only once, according to the activity to which they devote the most time, then the number of workers working in a given activity is underestimated because those doing it as a secondary activity are excluded. If, on the other hand, workers are counted in each activity in which they work, then the sum of the number of workers working in each activity will be larger than the total number of all workers because some workers will be counted more than once. This dilemma can be reconciled only by having two sets of statistics--one representing the total number of persons at work and the other representing the total number of job slots filled. The most practical means of counting the number of job slots filled in an industry is to survey employers in the industry. However, the only practical way of determining an unduplicated count of the total number of persons at work, in an industry or for the economy as a whole, is to survey persons in their homes.

In an industry such as agriculture, where seasonal labor demand results in employing many multiple jobholders and persons with low labor force attachment, this phenomenon produces what appears to be a bewildering, and at first blush conflicting, array of statistics. A firm engaged only in farming, employing only one or two people who work only on that farm, who do all the farm work, and do so year round, presents no problem. Each worker is counted as a farmworker once and only once by everybody, regardless of the definitions used, the time of year the survey is taken, or whether the farm business itself or the workers are the survey contact (i.e., establishment or household survey).

As the farm business grows large enough to have some degree of specialization among its workers, however, the problems begin. If one farm employee works full time keeping the books and another works full time repairing and servicing the farm machinery or driving a truck, the occupation of these workers would no longer be "farm laborer," but rather "bookkeeper" or "mechanic". Some definitions would count them as farmworkers (those counting workers who work on a farm) while others would not (those counting workers who do agricultural work). Similar problems arise if the farm adds a packing shed to prepare produce for market. If the packing shed then begins to pack produce of other neighboring farmers as well, the definition of a farm becomes a point at issue, because at some point in the process of adding volume due to the handling of produce grown on other farms, the packing shed operation ceases to be part of the farm business and becomes a separate enterprise.

Seasonality and job turnover add yet another dimension. If one of the full-time workers leaves his job and is replaced by another, there is still only one employee if the interview unit is the firm, but if the interview unit is the household, there may now be two farmworkers counted, depending upon the question asked. Now if seasonal employees are added, the number of employees encountered will depend upon when the count is made and what is asked (i.e., employment at a precise point in time or over some past period). Turnover among the seasonal component of the work force adds yet another confounding dimension.

The final complication comes when employers who do not themselves operate farms are added to the picture. If the farmer decides to discontinue hiring his own bookkeeper and instead has his books kept by an accountant in town, those farm employment counts that included the bookkeeper now lose a worker. But nobody really minds that much, because many of us thought the bookkeeper should not have been counted as a farmworker in the first place. But now suppose the farmer's operations have grown to the point that he decides to discontinue spraying his crops using his own workers and field equipment and instead contracts to have the spray applied by airplane and reduce his hired labor force. We have substituted an airplane pilot for a tractor driver. Some definitions would count the pilot as an agricultural worker if he was employed exclusively or primarily to do agricultural spraying but not if he did mostly other types of flying and only a small amount of spraying. Others would not count him as an agricultural worker no matter how much spraying he did. A similar problem arises if, instead of hiring and supervising seasonal harvest workers directly, the farmer contracts with a labor contractor (crew leader) to supply and supervise a crew to perform the harvesting operation. Now instead of paying wages, the farmer pays the contractor a fixed price per unit for a certain number of units of work (i.e., a certain price per box for apples picked). Now the pickers are no longer employees of the farmers, nor are they employees of any farmer, since the labor contractor is not a farmer. Whether or not they are still counted as farmworkers again depends upon the definitions. Unlike the airplane pilot cited earlier, these workers are doing the same work, in the same way they always did.

It is quite apparent from the admittedly lengthy but totally realistic foregoing discussion that the simple straightforward case that we started with, in which precise definitions were unnecessary and agreement was easy, quickly dissolves into a welter of definitions, statistical specifications, and differing statistical results. The familiar terminology of "farm," "farmer," and "farm work" becomes useless. Whether you count the people working on farms, the people doing farm work, whether you do it in April or September, whether you classify people according to what they are doing on a precise day or during a week or a year, and whether you contact establishments or households, is all going to have a marked effect on the numbers one ends up with. None of the numbers are inherently right or wrong. One way of counting may make more sense for one purpose while another may make more sense for another purpose. Some may make sense for a good many purposes; others may be mostly meaningless. We are examining here some of the farm employment statistics which we feel have greatest general utility, recognizing that no one statistic is going to meet every need.

The major household survey sources for both agricultural and nonagricultural work force data are the decennial Censuses of Population and the monthly Current Population Survey (CPS). The latter is conducted by the Bureau of the Census and serves as the basis for the household data released monthly by the Bureau of Labor Statistics (BLS) and the Hired Farm Working Force (HFWF) series published annually by the Economic Research Service (ERS). 1/ There are several major establishment series gathered by various agencies. These include the Census of Agriculture taken every five years, quarterly surveys made by SRS, 2/ monthly surveys of business conducted by BLS and others.

In addition, there is a great deal of employment related data generated in the course of administering labor force programs. Examples would include Unemployment Insurance data and the data on migrant and seasonal farm workers being generated by the Employment and Training Administration. Unfortunately, it is difficult to generalize from these program data, because it is difficult to delineate the characteristics of the populations from which they derive. We are not treating these sources in this report. However, the authors feel these data are potentially useful, since they can frequently be obtained with great economy relative to primary survey data. Additional attention needs to be directed at them, particularly at ways of delineating more clearly the program populations.

The following two sections of this chapter present a brief discussion of the major sources of household and establishment data on agricultural employment. An appendix to this chapter presents a brief discussion on major nonagricultural employment sources indicating those areas in which there are and are not equivalent agricultural and nonagricultural employment data.

Agricultural Employment Data

Household Surveys

The series based on household surveys have similar objectives, namely to provide an estimate of the number of persons in the agricultural work force and to enumerate certain characteristics of them and their households. The surveys differ largely in the characteristics enumerated and in the size of the sample, and therefore, the geographic areas for which reliable estimates can be made.

Problems in comparability exist, principally involving time period to which the estimates refer. Great seasonal variation in size, composition and location of the agricultural work force tends to intensify this problem. The Censuses of Population report the number and characteristics of persons employed in agriculture during an April survey week of the Census year. The ERS Hired Farm Working Force series reports the total number of persons who

1,2/Under reorganization in the Department of Agriculture since this paper was initially presented, the Economic Research Service and the Statistical Reporting Service have been redesignated as the Economics and Statistics units in the Economics, Statistics and Cooperatives Services. We will continue to use the previous titles to maintain consistancy with other references to USDA data series.

did farm work for wages any time during the year. The BLS labor force data report the number of persons doing farm work primarily during a reference week each month.

Censuses of Population

The Census of Population constitutes the only attempt to make a complete enumeration of the national population. Information is obtained regarding size, residence, and general characteristics of the labor force and nonlabor force populations. It is useful in this review as a source of data on actual and potential members of the farm labor force. Data are available for states, counties and other areas within states, and by a variety of categorizations of place of residence.

Enumeration takes place in April as mandated by law. The Censuses are now largely self-enumerated, and a considerable portion of the social and economic data are obtained by sample. Employment data refer to the calendar week preceding enumeration, and to the employment at which the respondent spent the greatest number of hours during the survey week.

Relatively few detailed demographic tabulations pertaining to specific occupation or industry groups of workers are presented in the Census of Population. Furthermore, the seasonality associated with agricultural employment precludes an accurate appraisal of the size or composition of this work force by using a point in time, particularly early in April. Large increases in the agricultural work force occur during the growing season which follows the Census enumerative period. The Census accurately reflects the number of farm workers nationally at the time of enumeration as migrating worker are counted at their usual place of residence. However, short-time and under-age workers who enter the farm work force later in the year go uncounted. Furthermore, with agricultural technology changing rapidly, the lack of currency in Census data requires that its use in assessing the size and character of the farm work force be specific and qualified.

BLS Labor Force Estimates

The Current Population Survey 3/ upon which these series are based is conducted monthly by the Bureau of the Census. Labor Force statistics from the CPS, along with other information based on data from establishments, are published by BLS. Although this publication includes primarily data on the total labor force and on nonagricultural sectors, national estimates of many aspects of agricultural workers are reported. Statistics descriptive of both the employed and unemployed members of the current labor force are provided. Employment data from the CPS are published monthly in Employment and Earnings.

In January 1967, the minimum age for inclusion in the labor force was raised from 14 to 16 years of age and other concepts were changed. Estimates for most major series were revised back to 1947 on an annual basis and for

3/ For additional detail on the CPS see the appendix to this section.

1966 on a monthly basis to reflect the new age floor. However, data on the employment status of 14 and 15-year-olds in agriculture are published separately each month which permits conversion of current estimates to the 14 and over basis.

The survey provides information at the national level for useful classifications of farm workers: (1) wage and salary workers, (2) self-employed workers, and (3) unpaid family workers. Another classification for occupations includes: (1) farmers and farm managers, and (2) farm laborers and foremen; with the latter often subdivided into paid workers and unpaid family workers. Data on the agricultural work force by age, sex, color, hours worked per week as well as some classifications of the unemployed for the survey week each month are published.

The BLS labor force data are useful principally in giving an indication of the size of the adult agricultural work force on a national basis. Data on characteristics of workers by month can be used to determine to some extent how the size and composition of this work force changes seasonally. In addition to information released by BLS each month, supplements are added to the CPS questionnaire for certain months. Various subjects are covered in the supplemental questions such as migration, income by source, marital status, educational attainment, work experience, and school enrollment.

Results of supplemental questions on multiple jobholding, which currently are asked in May of certain years, indicate that an increasing proportion of people who work on farms are classified as nonagricultural workers by BLS. This apparently has resulted because: (1) employed persons are counted only once and are classified according to industry in which they worked the greatest number of hours, (2) the strong tendency to work the standard 40 hours a week in nonagricultural jobs, and (3) the increasing tendency to combine part-time farming with a nonagricultural job.

The following aspects of the survey limits somewhat the usefulness of the information with reference to agriculture.

1. Youth under 14 years of age are not covered.

2. Unpaid family members who work fewer than 15 hours during the week are not included.

3. Characteristics of employing farms at the submajor industry group are not obtained. Data are available only for the Major Industry Group which includes Agriculture, Agricultural Services, Forestry and Fisheries employment.

4. Unavailability of information on a regular monthly basis for areas smaller than the nation.

ERS Hired Farm Working Force

This body of data is based on information obtained for the Economic Research Service and predecessor agencies by the Bureau of the Census through

supplementary questions on the Current Population Survey for one month each year. Beginning in 1961, the supplemental questions have been asked each December. Certain previous years, they were asked in January or February. If an affirmative answer is received to a screening question designed to identify persons who did hired farm work during the year, additional questions are asked relating to days of farm wage and salary work and farm earnings, migratory or nonmigratory status, nonfarm wage or salary work and associated earnings, chief activity during the year and other characteristics. Thus, the number of people who did any farm wage work during the year are estimated along with their characteristics and earnings. Estimates are made for the nation and in less detail for four regions.

Persons who did hired farm work during the year but who died, entered the armed forces, or were otherwise removed from the civilian noninstitutional population before the survey are not counted. This means that foreign workers who did hired farm work in the United States but had returned to their homes before the survey was conducted are not included.

The data are published annually. The report is chiefly devoted to information for the current year but some historical data are included. Annual estimates of hired farm workers by various combinations of age, sex, color, migratory status, place of residence and length of employment are presented. Days worked and wages earned on a daily and annual basis for both farm and nonfarm wage and salary work are shown for these and other characteristics of workers.

The data provide unique information regarding the size, composition and mobility of the hired farm labor force. The information on duration of and earnings from farm and nonfarm work provides insight into the tenure of farm employment and the characteristics of workers of various tenure classes.

Establishment Surveys

The principal establishment surveys dealing with agricultural employment are the USDA's, Statistical Reporting Service (SRS) quarterly labor surveys and the Censuses of Agriculture. The principal objective of the SRS survey is to provide estimates of farm employment, hours worked and wage rates. The section of the Census of Agriculture devoted to farm labor seeks to measure the magnitude of hired labor used on farms and the characteristics of farms hiring labor.

Censuses of Agriculture

The principal consistent agricultural labor data obtained in the Censuses of Agriculture has been that pertaining to the number of farms hiring labor, and payroll for the year preceding enumeration. Although most of the Censuses have also included questions on employment or number of workers, the utility of this information has been marred by an incredible variety of factors. Since the 1950 Census there have been changes in the time period of enumeration (and therefore the reference week for employment questions), constant changes in the employment questions, and other more technical variations that have made the comparability of the Census data with previous Censuses or with other sources virtually impossible.

SRS Quarterly Survey

After many years of reporting monthly farm employment data based on voluntary survey response, beginning in 1974 estimates were published based upon a quarterly probability survey conducted in January, April, July and October. Data pertain to employment on the respondent's farm for the reference week containing the 12th of the month, to correspond with the CPS reference week.

The sample frame for these surveys consists of: (1) an area segment sample by which every agricultural land area in the U.S. can be sampled at a known probability, and (2) lists of large users of farm labor, which are also sampled at determined rates. The latter lists provide a more efficient means than the area sample for gathering data from large users of hired labor. Certain tehcnical problems of overlap are handled in the estimating procedure.

A developing problem in measurement of farm labor is being attacked in the SRS Quarterly Survey. It relates to the increasing use by farmers of "agricultural service firms" on a contract or fee basis to perform farm operations that formerly were done chiefly by farm workers. These operations include corn shelling, hay baleing, threshing or combining small grain, harvesting, sorting grading, packaging, packing and shipping many products but usually fruits and vegetables, spraying agricultural chemicals with airplane or ground machine, hatching poultry eggs, and boarding and breeding of livestock. Often, pay for both equipment and labor is included in the fee. Workers employed by these firms are largely excluded in current estimates of both SRS farm employment and BLS nonagricultural employment based on reports from establishments. But these firms are being brought into the sample for the SRS Quarterly Survey. More will be said on this issue in Section IV of this report.

The survey uses several different questionnaires, each tailored to the particular list to which it is addressed. The questions are directed to collecting the following basic information: (1) unpaid family workers, including operators: number and hours worked; (2) hired workers, including paid family members: number, hours worked, and type of work, plus some basic demographics; (3) agricultural services: number, type of service, employment, and method and rate of pay; (4) wage rates for hired workers: amount and method of pay, such as per month or per hour, with or without perquisities; (5) data for classifying farms by type and economic class.

Although the quarterly surveys have brought vastly improved statistical precision to the SRS farm employment estimates, the definitions, concepts and tabulations used were borrowed largely unchanged from the monthly voluntary crop reporter's estimates. Opportunities now exist for expanded data presentation and greater comparability with nonagricultural employment statistics. Since comparability with past estimates largely disappeared with the change to the probability estimates, the time would seem ripe for some other conceptual changes as well. These are discussed in more detail in Section IV.

CHAPTER II APPENDIX: NONAGRICULTURAL EMPLOYMENT DATA SOURCES

Labor data series pertaining to the nonagricultural sector also arise from two bases: household surveys and establishment surveys. The basic sources for the household surveys are the Census of Population and the Current Population Surveys. The establishment surveys are somewhat more scattered. Although the Census of Manufacturers is quinquennial, there are many other more scattered reporting programs in the Bureau of Labor Statistics.

Household Surveys

Household surveys are by definition nonspecific to the occupational category and industrial sector of the individual's employment. Consequently much of the information collected in such surveys is available with respect to both agricultural and nonagricultural employment, although the former is not always broken out in published tabular form. The reasons for this are presumably, (1) the sparsity of sampling which does not permit refined breakdowns of agricultural labor with an acceptable level of statistical reliability and (2) a division of responsibility between the Department of Agriculture and the Bureau of Labor Statistics.

Current Population Survey (CPS)

The CPS is a monthly national survey carried out by the Bureau of Census for the Bureau of Labor Statistics (BLS). 4/ The Bureau of the Census has the responsibility of collecting and tabulating the data while the BLS is responsible for analyzing and publishing the data. Although the CPS now provides information on "... a wide variety of demographic, social and economic characteristics of the population," it originated in 1940 under the Work Progress Administration with a primary focus on employment and unemployment.

The CPS relates to the noninstitutional population 16 years of age and over, based on a monthly sample of 47,000 households selected by a random sampling procedure. The data refer to the week of the month including the 12th day. The sample is set up on a rotational pattern. A household is in the sample for a total of eight months: it is in the sample for four consecutive months, out for the following eight months and back in for the following consecutive four months. The rationale for such a procedure is to provide stability and continuity to the data which might not be achieved by a new sample every month. By the same token, rotating households out of the sample and new ones in avoids the problem of uncooperativeness and possible bias resulting from interviewing over an extended time span.

The CPS was originally designed as a source of national data rather than state or regional data. Recent expansion of the sample size may make some items available at lower levels of aggregation and additional expansions are being planned which would further increase the reliability of this data source for state and regional employment estimates.

4/ This draws heavily from the BLS Handbook of Methods, from which the interested reader can obtain greater detail.

It is a somewhat arbitrary question as to whether or not the CPS data are deficient with respect to agricultural employment since the same data are collected regardless of the employment sector. The "deficiencies" arise only in the published form; the raw data include the same information for all. Although the CPS tapes now available are useful, they are basically useful only for specialized purposes. They are at best a poor alternative to published tabular information equivalent for both sectors. 5/ The following indicate the data collected and the underlying conceptual basis.

Persons employed are classified on the basis of the reference week. Included are two major groups: (1) paid employees, self-employed persons, and those working 15 hours or more as unpaid workers in family operated enterprises, and (2) those not working "...but had jobs or businesses from which they were temporarily absent due to illness, bad weather, vacation, labor-management dispute, or various personal reasons..."

Employed persons are categorized by occupation including farmers and farm laborers separately. Breakdowns by full-time or part-time are quite limited for agricultural employment relative to nonagricultural employment. 6/ Except for this point, the published data are broken out for agricultural employment equally with nonagricultural sectors.

The following information is collected by the CPS for each household member 16 years of age or over: race, age, sex, type of living quarters, employment status, hours worked last week, time off last week, usual working hours, reasons for not working, wage rate, months worked, hours worked/week. In addition to these are data collected in December of each year specifically oriented to farm workers, discussed previously in this section and in Section V.

Census of Population

The Census of Population is not occupation specific; the same information is collected whether the person is associated with the agricultural or nonagricultural sector. A general description of the data is given in the main body of this section. The only sense in which there is differing information is in the occupation classification.

The 1970 Census has 12 major occupation groups of which one was farm laborers and foremen. There is far less breakdown of this category than is the case for nonagricultural workers. As a result, the data are rather heterogeneous.

Establishment Data

In contrast to household data, the interview unit for establishment data is the firm. Consequently, the data are more descriptive of the firm and its

5/ This is not to deny the usefulness of the CPS tapes for many other purposes. Their availability is a long-awaited event for many research purposes.
6/ The December special survey has greater detail, but only for hired farm workers. Secondly, comparability with the monthly data is not direct.

jobs than of the persons who work there. The two major sources of establishment data are the Bureau of Labor Statistics and the Bureau of the Census.

Both of these sources are primarily nonagricultural data sources and thus unlike the household data, the comparability questions with existing agricultural employment data goes beyond whether or not comparable tabulations are made. First, the identical raw data for both groups are not there to be gleaned, and secondly since they arise from different sources, alternative definitions and procedures are to be expected. Since our interest is only in those aspects of nonagricultural employment data which are relevant to agricultural employment, this discussion will not be an exhaustive presentation of nonagricultural employment data.

Employment, Hours and Earnings

One set of establishment data relates to employment, hours and earnings. Although these monthly data had their origin in 1915, it was not until after the Great Depression that the program took on its current format. As stated by the BLS, "The ultimate goal of the [employment, hours and earnings data] is to provide current estimates of employment, hours, and earnings for all nonagricultural industries in the nation as a whole, and also for all significant industries in all states and all Standard Metropolitan Statistical Areas..." The major publication outlet for these data is also Employment and Earnings, published monthly by BLS.

The data are sample data collected on a voluntary basis through cooperative federal-state agreements. In order to establish reliability on the sample data, data from the nearly universal unemployment insurance program supplemented by County Business Pattern data are used as benchmarks. The data are collected on what is commonly referred to as form BLS 790. As with the CPS and other federal employment data, the reference point is to the week of the month including the 12th day.

The following data are collected for each establishment:

1. The number of full- and part-time production workers.
2. Total gross payrolls for production workers.
3. Total hours worked by production workers.
4. Overtime hours for which premiums were paid production workers.
5. Total employment.

Labor Turnover

Labor turnover has arisen recently as a major area of concern by many large agricultural employers. But there are no data which relates to the issue. By contrast there is an ongoing series of the BLS which relates specifically to this question. The data are treated separately for accessions and separations of employment. Publication is monthly in the form of the rate per 100 employees.

These data relate to the following concepts: separations, quits, layoffs, discharges, other separations, accessions, new hires, recalls, and other accessions.

These data are sample data collected on a voluntary basis, again through federal-state cooperation. The sampling universe is those firms subject to unemployment insurance. The data are categorized by type of industry according to SIC code. Summaries of the data are published by industry classification at the national level and for selected states and metropolitan areas monthly in Employment and Earnings.

Occupation

An additional nonfarm establishment survey is conducted by state Employment Security agencies for the purpose of detailed occupational data (the OES survey). The data are categorized by industry and for 2,000-2,500 occupations. The survey is rotated over a three-year cycle among industries.

The data are sample data drawn from a universe of establishments in state unemployment insurance programs. Data relate to the pay period including the 12th day of the month in which the data are collected.

Industries are classified according to the SIC manual. The occupational classification is drawn from the 1965 Dictionary of Occupational Titles and the Census of Population classification system. The results of the surveys are published by the state employment security agencies.

Miscellaneous Data

In addition to the above general employment, unemployment and wage data, a variety of other nonagricultural labor data are collected, principally from establishment surveys. Employment and wage data for industries covered by unemployment insurance, by SIC code, are published quarterly by BLS in Employment and Wages. Data on the insured unemployment (not establishment) are also published. Occupational pay and supplementary benefits surveys, focused primarily at rates of pay categorized by occupations, are conducted intermittently on a rotating basis and published in the Monthly Labor Review.

A variety of wage data related to workers covered by collective bargaining agreements are monitored by special surveys published in Current Wage Developments. This publication also reports wage chronologies on a group of labor-management agreements, and the "package" cost of major wage and benefits agreements.

Estimates of annual earnings by industry for the private nonagricultural sector are developed annually by BLS in an Annual Earnings and Employment Patterns series. The primary source for the data is the Social Security Administration with some information coming from the Railroad Retirement Board. Since wages are reported to Social Security only up to the maximum taxable wages, the wages of those exceeding this are estimated for the remainder of the year.

An Employer Expenditures for Employee Compensations survey is conducted by BLS to provide a measure of employee cost beyond the wages paid. The data are sample data with the establishments drawn from a supplemented unemployment insurance universe for the private nonfarm sector. As stated by BLS, "The survey relates to employee compensation practices, employer expenditures from using these practices, and to all hours for which payment is made -- hours worked, paid hours of vacation, holiday, sick leave, and civic and personal leave."

The data are biennial and are classified by manufacturing and nonmanufacturing industries, all employers and office and nonoffice workers separately. Nonoffice workers are also separated by union and nonunion membership.

An Employment Cost Index is under development by BLS. The objective of the program"... is to produce a timely and comprehensive measure of changes in the price of labor services..." similar to what the Consumer Price Index does for consumer goods. As such, it will include in addition to hourly earnings, the costs of benefit programs. The survey is currently restricted to the private nonfarm economy quarterly, but will eventually be expanded to ecompass the total civilian economy on a monthly basis.

The data are collected by a probability survey from establishments. Stratification is done by SIC industry codes as well as across occupations (1970 Census of Population) to obtain representative components of the cost index. This permits obtaining indexes of major components of the series as well as an overall index. The wage data are collected as hourly rates of pay and relate to the occupation rather than the individual. The collection of data on benefits has not yet begun.

Although the series does not at this time include the agricultural sector, the plans are to include it at a later date. One feature which needs careful study is the Census of Population occupation category--farm laborers and farm supervisors. Additional refinement of this would produce useful data through this survey. The series is published quarterly under the current program.

Other series published by BLS pertain to work stoppage, summaries of provisions of collective bargaining agreements, union and labor association membership, and occupational injuries and accidents.

The Bureau of the Census produces several establishment employment data sources for nonagricultural industries as follows:

The Economic Censuses include the quinquennial Census of Manufacturers, Census of Wholesale Trade, Census of Retail Trade, and the Census of Selected Service Industries. These are establishment based censuses at a given location. All are categorized by SIC definitions. Payroll information is collected defined to include all forms of compensation rather than just wages. The same definition for payroll is used as on Treasury Form 941. Paid employees are reported as of March 12 for the Trade and Service Censuses, and the 12th of the months specified for Manufacturers. The Census of Manufacturers in addition separates out production and related workers. Man-hours for production and related workers are also collected for the Census of Manufacturers.

The Annual Survey of Manufacturers is designed to provide information for intercensal years. Data are collected on employment, man-hours, and payrolls among other nonemployment data. Data on both total employees and production workers are collected. The data follows the same format as the Census of Manufacturers. The sample in 1974 consisted of about 7,000 manufacturing establishments.

The County Business Patterns data are derived from employment and payroll information reported on Treasury Form 941, Schedule A. This information is supplemented by a special survey of multi-unit companies. Most private nonfarm establishments are included. The data include taxable payrolls for the January-March Quarter of the year. The employment data by SIC categories are as of March 12 as reported on Treasury Form 941. In contrast to much of the other data collection which is voluntary, reporting for this program is mandatory under Social Security.

III. BASIC ATTRIBUTES OF AGRICULTURAL EMPLOYMENT AND THE AGRICULTURAL WORK FORCE

Concepts & Definitions

Farm employment seemingly ought not to be so difficult to measure. Work done on a farm is farm work; persons who do farm work are farm workers. Right? Maybe. If a person who does farm work is paid wages, he is a hired farm worker; if he does farm work and is not paid wages, he is either an operator or unpaid family labor. Right? Maybe.

We have become accustomed to the reality that many farm residents have nonfarm occupations and that persons occupied in farming may live elsewhere. This sort of separation is easily accepted for hired workers, but the statement that one fourth of all farm operators do not now live on farms is a fact for which proof is sometimes demanded. Where they live and what they do are matters in which Americans have incredible mobility and dexterity, and these attributes come into full bloom with respect to farming. Much of the nation's farm work--both hired and self-employed--is done by persons whose principal occupations are in other sectors and, of course, the reciprocal of this is also true. And it also occasionally occurs that not all work done on a farm is farming.

Farms and Farming

Elusiveness about farm work and farming occupations commences with the activity unit itself. Economists like to think about it as an enterprise or as a unit in an industrial system. Actually, the words "farm" and "farmer" have about as much political and literary usage as they do economic.

In this report we will be primarily concerned with the concept of agricultural production as an industrial activity and presume others have jurdisdiction over the definition of what constitutes a "farm". Thus we interpret our job as being concerned with identification and measurement of persons and amounts of employment involved in agricultural production. (We will, in fact not find it necessary to define or use the term "farm" in any precise sense). Furthermore our focus will center on "agricultural production" work rather than the sometimes more inclusive concept of "agriculture," which loosely may embrace some activities of the marketing, supplying and service sectors.

Self-employed

Notwithstanding all the changes in enterprise structure that have occurred, the farm operator and members of his family still are the main labor force in American farming. Among the nation's major industrial sectors, this is a considerable novelty. It does not accord with the standard labor force conception; yet, no accounting of labor used in the farming sector would be accurate if this segment were not included.

The familiar components are "operator" and "unpaid family labor." What we know about them derives mainly from reported activity during a survey week. "Operators" who did any work in a survey week and who were not hired managers or paid officers of a corporation are included. If there are partners, one is counted as the operator and the remainder are classified as unpaid family members. The historical concept of an unpaid family worker is anyone not working for wages who did at least 15 hours of work on the farm during the survey week. If family members are paid wages, they are classified as hired workers. Household status rather than blood relationship underlines the concept of "family".

Who is an "operator" seems to be the main question in this complex. According to our current conceptions, a person need do very little operating to be classed as an operator but if he happens to be a partner he will be excluded regardless of how much operating he does. A full time factory worker who lives on a place defined as a farm and who feeds the chickens in the evening can be a farm operator. But the lawyer who lives in town and is the owner of a large commercial farm who has an inspired entreprenurial thought at the stop sign on the way home and telephones it to his manager is not an operator; nor is his manager. Definitions can produce ridiculous results--the little chicken flock has an operator; the large commercial farm has no operator; feeding the chickens is productive work; thinking profitable entrepreneurial thoughts is not.

The orthodoxy of American farming is self-employment together with capital ownership and entrepreneurship. Much of reality, however, finds these functions separated and divergently supplied. Established trends suggest still greater separation. Notwithstanding that entrepreneurship is an integral function of farm work we believe it impractical to try to account for entrepreneurial activity that is not embodied in the work force of the farm. This means excluding nonresident owners and investors even though they may spend considerable time doing the very same thing as many on-farm operators do much of their time. Trying to account for off-farm entrepreneurial inputs is more than a statistical system could bear.

Hired Farm Labor

According to the only estimate series available, some 2 3/4 million persons do some hired farm work during the year. This series is based on data derived from the December CPS sample; estimates are prepared in ERS and annual reports, The Hired Farm Working Force, are issued in the Agricultural Economic Report Series. From this source, now more than 30 years old, we know a great deal about the characteristics and labor force participation of the population that does the hired work on the nation's farms. However, the household sample is small and the information obtained depends upon recall of the year's activity; estimates are made mainly in national totals and averages.

Farm Work by Persons Who are Not Farm Workers

For only one fourth of those who did some hired farm work in 1975 was it the person's chief activity; the large majority were mainly not employed at all or were mainly employed at nonfarm work. Of the fraction for whom farm work was chief activity, almost half worked less than 250 days (for all employers). In terms of its population, the hired farm labor scene nationally is dominated by persons who mainly are students, housewives, retirees, temporarily unemployed nonfarm workers and others who, for whatever reasons, are mainly unemployed or mainly not in the labor market. This heterogenity in hired farm labor is the counterpart of that found in farm self-employment--both are exceptional characteristics of the agricultural sector.

Labor force characteristics and participation, when the employment relation is so causal, would obviously not be obtainable from employers in an establishment survey. If these data are worth obtaining, which we believe they are, the worker household is the only feasible source.

Regular Workers; Regular Jobs; Turn-over

The household survey supplies the basis for estimating the regularity with which workers do farm work; it is not a good source for determining the extent to which workers left longer term jobs or the extent to which apparently regular workers are in a series of short term jobs. To know the content of an employment relationship requires obtaining the employer's perspective. It seems plausible that there are more year round farm jobs than the annual work histories of the HFWF reflect. Hence, this is one of the aspects of farm employment upon which dependence must be placed in the establishment survey.

Migrants

The proportion of seasonal or temporarily employed hired farm workers who are migratory is small. That this category is listed for separate discussion is only because it looms so mistakenly large in popular conception. Not exceptionally, any collection of workers seen stooping over row crops or working on ladders in fruit trees will be called "migrants." People living in rural shacktowns are also likely to be called migrants, regardless of how long they have steadily lived there or whether they actually do farm work. The term contributes nothing but obfuscation to communication; it is not a significant category for labor force analysis. But, as with the word "teamster", it is not likely to go away soon. Questions will be asked that cannot be turned away by advising the interrogator to ask more significant questions.

Migratoriness is only one form of mobility; it is something other than residential relocation, job-changing or commuting. It has something to do with leaving one's home temporarily to work or not having a permanent home. Yet there are many among the fashionable and opulent who could qualify as migrants with respect to where they live or sleep but they are not commonly so identified. Among the many less opulent than resort entertainers who also could meet the test of migrancy are numerous workers in construction, mining and forestry. They also are not usually regarded as migrants. Apparently, to meet the popular conception, a form of movement must include some Joad-like characteristics and a connection with farming. Again, we are having to deal with a concept that is more political and literary than economic.

The only continuing series available on farm migrancy is that of the Hired Farm Working Force. According to a definition that generally involves leaving home and crossing a county boundary or having no permanent home but doing some farmwork within the survey year, migratory persons are estimated. They now amount to 7 or 8 percent of all persons who do some farm wage work; their numbers are now just under 200 thousand. These persons are so classified by reason of having done a stint of migrancy some time during the survey year. We know that for many, only a portion of the work year involved migrancy; yet the published tabulations show the year's work as though all of it had been done while the persons were in migratory status. Migrants, while in migratory status, may not do as much as 3 percent of all man-days of work performed by hired workers of all man-days of work in the nation's farming; this proportion may not much exceed one percent. The maps of migratory streams--Atlantic, Pacific and Mid-continent--which in the past were so prominent and still are to be seen now and again, embodied more flows of imagination than of people. The main role of a data series on migrancy is to do battle with misconception.

Crew Leaders; Labor Contractors; Contract Services

When a crew leader merely brings a bus load of workers to a farm for them to be employed, supervised and paid by the farmer, there is apparently no great obstacle to identification of them as farm workers in either the household or establishment survey approach. The difficulty of identifying farm work would not likely be much greater in the household survey when the labor contractor does the work on contract with the farmer, and the labor contractor supervises and pays the workers--but in this situation, this element of employ-

ment could easily be missed in the establishment survey. A still more complex category is the service contractor who comes to the farm with his own equipment, supplies that he furnishes, and his own crew of employees. The service may involve harvesting and packing, fertilizing, applying insecticide, land leveling or chick sexing. On farms lying side-by-side, an airplane pilot and a farm laborer may be performing work in different ways to serve identical ends. Everyone concerned recongnizes one as a farm worker; nobody concerned recognizes the other as a farm worker. Is this a burden of illogic to be suffered or to be overcome?

We have not endeavored to follow statistically and incorporate as farm work those many aspects of erstwhile farm work that historically made the transition into allied industries. Perhaps it is no less logical that services performed on the farm fall into the same occupational and industrial categories as services of a like nature performed off the farm. Is it what is done or where it is done that counts? Is it what or where, by whom, or by which employer that counts?

The Universe of Jobs and Workers

Among the most insistent demands placed on agricultural employment data series is for measurements of worker availability and labor requirements (sometimes loosely referred to as labor supply and demand). Again the peculiarities of the industry frustrate simple logic. It is well recognized, of course, that an employment statistic at a point in time says nothing about the number of vacant jobs for which workers are being sought or the number of workers seeking jobs. An employment statistic at a point in time tells only what is at that time, according to a specific definition and set of procedures. One cannot say that that level of employment is good or bad, or "in balance" or not. An employment statistic by itself has little social significance. (Its political significance is, of course, another matter.)

The notion of job vacancies, or labor demand is dependent on the notion of a "job slot" or position. In its most straightforward form it consists of a daily unit of work to be accomplished by an individual on a continuing, though not necessarily indefinite, basis. The work situation often defines the number of job slots--so many positions on an assembly line, so many desks, so many tools or implements to be used. In some situations the number of job slots is more a matter of managerial prerogative than of the structure of the work situation, for example policemen, store clerks and full-time farm hands.

The question of labor requirments in agriculture arises frequently in the context of seasonal work. Unfortunately it is in that context that the notion of a quantitative agricultural labor requirement is most nebulous. This is true primarily because most seasonal agricultural activities are "batch" processes rather than continuous or flow processes. For example, a crop reaches maturity, and the job is to harvest it. Generally speaking, the farmer's desire is to get the job done in the shortest possible period of time, because there may be product deterioration associated with elapsing time (apples, peaches, tomatoes), or the uncertainty of bad weather (snow, rain, frost, etc).

Often there are only very broad constraints other than manpower availability on the amount of the task that can be performed in a day. (These constraints would usually take the form of limitations on capacity to transport or receive the product at the next stage in the processing or marketing chain. This capacity is frequently in excess of what would be adequate to accomplish the task in the time likely to be available.) Since the cost per unit to accomplish the harvesting task will be approximately the same to a grower regardless of how many workers are used or how many days the job takes, the risk averse manager will desire to accomplish the task in the shortest possible time consistent with whatever constraint is governing, even though it is likely that the harvest period could be extended over a longer period of time. The number of workers demanded by an employer then becomes the number necessary to accomplish the task in the shortest possible time given the expected productivity and turnover rates of the workers. When anything short of that exists, which it is likely to, and a farmer is asked if he could use more workers, the answer is likely to be yes, even though the fixed quantity of work could be handled by the labor force.

Labor availability, is an equally difficult concept to quantify. A very substantial proportion of those in the agricultural labor force at some time during the year are either multiple jobholders or persons otherwise not in the labor force. There is also evidence of substantial turnover among seasonal agricultural workers. The duration of work of seasonal agricultural workers is apparently in part a matter of the duration of the job and in part a matter of individual decision. Perhaps one of the least well understood of all facets of the agricultural labor scene is the processes by which workers decide to enter and exit the agricultural labor force. Confounding the difficulty is the reasonably well documented finding that a substantial number of agricultural workers, at any given time, are on their first stint of agricultural work. In this context, the most useful measure of labor availability, the experienced unemployed in a given occupation, has little meaning, except for the relatively small year round component of the agricultural work force. (It should be pointed out however that some agricultural workers working at seasonal work are full-time workers in the sense that they piece together a succession of seasonal jobs, or attempt to do so.)

Concluding Observations

In designing agricultural employment data systems, choices are required, inevitably many must be arbitrary. Which elusive element in an unstable universe to attempt to follow with statistical series is a Hobson's choice. But the choices ought not to become another source of obfuscation to an already confusing situation, i.e., they should avoid being a compound of diverse fractions of arbitrariness.

Also, whatever choice is elected should be consistently treated by all concerned with employment statistics. It clearly does not contribute to anyone's enlightenment, for example, to have a fraction of the nation's employment disappear into thin air because one series counts employment by farmers and another counts nonagricultural employment. Estimates derived from households and from employment establishments are both essential. Deliberately striving to make the household and establishment surveys more complementary can improve the contribution of each.

IV. ESTABLISHMENT STATISTICS

Employment statistics derived from establishment surveys provide a description of job slots presently filled. They can provide only limited information about persons filling those job slots, namely that information known by the employer and likely to be included in employee records. This would typically include information about characteristics of employment and earnings of the worker for that employer, and might include limited demographic information such as sex, age and possibly ethnic background. Such magnitudes as employment and earnings of individuals and households over time, and similar characteristics can only be obtained through household surveys because of multiple job-holding and seasonality phenomena, both of which are, of course, hallmarks of agricultural employment.

The principal establishment series have been described in Section II. Establishment data for agricultural employment have been collected and published by SRS and the Bureau of the Census with the farm as the principal survey unit. Nonagricultural establishment data are collected and published by the U.S. Department of Labor and the Bureau of the Census, with the nonagricultural establishment as the reporting unit.

This divided responsibility can and has given rise to differences in population definitions that lead to gaps and overlaps in statistical coverage. It also can and has given rise to differences in major classification variables and statistical procedures that inhibit useful comparisons. Our premise has been that ideally statistical measures should not be affected by the fact that administratively it has been determined that agricultural labor data are to be collected primarily by one agency and nonagricultural labor data by another.

A major portion of this section is devoted to recommendations for changes in coverage and concepts of agricultural employment statistics that will make them conceptually more nearly comparable to current nonagricultural statistics. In our judgment the changes will also make the agricultural statistics more reflective of the current status of American agricultural employment. A second set of recommendations in this section deals with revisions and expansion in the reporting of existing agricultural employment data, to make it more informative as well as more comparable to other data.

Redefining Key Employment Concepts

Agricultural employment statistical reporting has been handicapped by having become wedded to some terminology which was probably capable of reasonably unambiguous definition when it was first used, but which has become increasingly difficult to define precisely for statistical purposes. Two such terms are "farm" and "farmer" or "farm operator." These terms obviously have appropriate everyday usage, and in some context appropriate statistical usage as well. However, changes in the structure of agriculture have destroyed the utility of these items in employment statistics. Furthermore they have no nonagricultural counterparts.

The term "farmworker" is variously used to describe persons doing farm work and persons working on farms. However, agricultural employment like all other employment has both an occupational dimension, describing the kind of functions performed, and an industrial dimension describing the kind of business or employer for whom the job is performed. Since there are occupations other than agricultural production workers represented on farmer's payrolls, and a considerable number of persons engaged directly in agricultural production who are not on farmer's payrolls, the same term cannot simultaneously be used to refer to both groups with precision. As one moves away from the concept of the production worker working on a farm, either occupationally or industrially, the cutoff point in the definition of farm work becomes somewhat arbitrary. Although the precise line may be arbitrary, it nevertheless must be drawn.

By definition, establishment series are structured by industry, while household employment survey data focus on occupational classifications. This is not to say, however, that occupational cross-classification within establishment data are not meaningful. Such a cross-classification, in fact, serves to focus our attention on what a meaningful employment data collection scheme for agriculture might be.

There are two basic schemes for classification of firms by industry that dominate statistical usage, the Standard Industrial Classification (SIC), and the classification of the Bureau of the Census in the Index of Occupations and Industries. Efforts to merge the Census system into the SIC have made substantial headway in the past decade and the two systems are now highly compatible. (A major problem that confronts the Census of Population, which depends upon household surveys, is to obtain sufficiently detailed data from employed respondents about their employers to make the detailed classification by SIC code possible).

There is somewhat less uniformity in the classification of occupations In addition to the Census' Index, there are other classifications in use such as the Dictionary of Occupational Titles (DOT) and HEW's Standard Terminology for Curriculum and Instruction. SRS has developed a limited occupation classification for agricultural workers. A Standard Occupational Classification (SOC) is presently under development to complement the SIC. 7/ The purpose of both the SIC and SOC, developed under the aegis of the Office of Management and Budget, is to promote uniformity in definition and reporting of statistics by Federal agencies. The SIC has received nearly universal acceptance and it seems likely that the SOC will be similary adopted. Definition of agricultural labor in terms of these systems seems to be most appropriatate.

Industry Classification

Any line separating agriculture from non-agriculture is somewhat arbitrary. The BLS major "nonagricultural" employment series, appearing in Employment and Earnings implicitly defines nonagricultural by excluding agricultural produc-

7/ The SOC has been published since this paper was originally presented.

FIGURE 1. AGRICULTURAL INDUSTRY CLASSIFICATION (SIC Codes)

Classification Headings Only

01 Agricultural Production - Crops

011 Cash Grains

0111 Wheat
0112 Rice
0115 Corn
0116 Soybeans
0119 Cash Grains, Not Elsewhere Classified

013 Field Crops, Except Cash Grains

0131 Cotton
0132 Tobacco
0133 Sugar Crops
0134 Irish Potatoes
0139 Field Crops, Except Cash Grains, Not Elsewhere Classified

016 Vegetables and Melons

0161 Vegetables and Melons

017 Fruits and Tree Nuts

0171 Berry Crops
0172 Grapes
0173 Tree Nuts
0174 Citrus Fruits
0175 Deciduous Tree Fruits
0179 Fruits and Tree Nuts, Not Elsewhere Classified

018 Horticultural Specialties

0181 Ornamental Floriculture and Nursery Products
0182 Food Crops Grown Under Cover
0189 Horticultural Specialities, Not Elsewhere Classified

019 General Farms, Primarily Crop

0191 General Farms, Primarily Crop

02 Agricultural Production - Livestock

021 Livestock, Except Dairy, Poultry, and Animal Specialties

0221 Beef Cattle Feedlots
0212 Beef Cattle, Except Feedlots
0213 Hogs
0214 Sheep and Goats
0219 General Livestock, Except Dairy, Poultry, and Animal Specialities

024 Dairy Farms

0241 Dairy Farms

025 Poultry and Eggs

0251 Broiler, Fryer, and Roaster Chickens
0252 Chicken Eggs
0253 Turkeys and Turkey Eggs
0254 Poultry Hatcheries
0259 Poultry and Eggs, Not Elsewhere Classified

FIGURE 1. (continued)

027 Animal Specialties

0271 Fur-Bearing Animals and Rabbits
0272 Horses and Other Equines
0279 Animal Specialties, Not Elsewhere Classified

029 General Farms, Primarily Livestock

0291 General Farms, Primarily Livestock

07 Agricultural Services

071 Soil Preparation Services

0711 Soil Preparation Services

072 Crop Services

0721 Crop Planting, Cultivating, and Protection
0722 Crop Harvesting, Primarily by Machine
0723 Crop Preparation Services for Market, Except Cotton Ginning
0729 General Crop Services

074 Veterinary Services

0741 Veterinary Services for Livestock, Except Animal Specialties
0742 Veterinary Services for Animal Specialties

075 Animal Services, Except Verterinary

0751 Livestock Services, Except Services for Animal Specialties
07522 Animal Specialty Services

076 Farm Labor and Management Services

0761 Farm Labor Contractors and Crew Leaders
0762 Farm Management Services

078 Landscape and Horticultural Services

0781 Landscape Counseling and Planning
0782 Lawn and Garden Services
0783 Ornamental Shrub and Tree Services

tion (SIC 01, 02), agricultural services (SIC 07), forestry (SIC 08), and fisheries (SIC 09). 8/ This is not altogether satisfactory since forestry and fisheries are not within the usual conception of agriculture. A second alternative is to include only agricultural production establishments (SIC 01, 02). A deficiency of this approach is that a large number of "production" workers are excluded, such as harvesting labor crews. A salient characteristic of U.S. agriculture over the past several decades has been the transfer of jobs from the direct employ of the farmer to various types of contractors who in turn employ workers. This has been one of the sources of "decline" in agricultural employment, since until recently these workers ceased to be counted in employment statistics once this change in employment relationship occurred. A third alternative is to follow the SIC major groupings, including all of categories 01, 02, and 07, i.e., agricultural production, crops and livestock, and agricultural services. This is conceptually clean at first sight, but reviewing previous editions of the SIC manuals, activities included in agricultural services have changed from edition to edition. A preferable procedure is thus to include only those activities which can be argued to be a part of commercial agricultural production, and to exclude the remainder. This is the current SRS approach. 9/

Thus, included would be the following agricultural service establishment categories (SIC 07):

0711 Soil Preparation Services
0721 Crop Planting, Cultivating and Protection
0722 Crop Harvesting, Primarily by Machine
0723 Crop Preparation Services for Market, Except Cotton Ginning
0724 Cotton Ginning
0729 General Crop Services
0751 Livestock Services, Except Services for Animal Specialties
0761 Farm Labor Contractors and Crew Leaders
0762 Farm Management Services

These are all reasonably close to agricultural production and conversely most excluded 07 categories are not sufficiently close to be a great concern. Perhaps the most questionable of the included services is cotton ginning. Similarly, veterinary services for livestock other than animal specialties could be argued for inclusion. However, consistency of the data series outweighs the importance of such changes. The types of establishments which should be incorporated in the establishment employment data are agricultural production (SIC 01, 02) and the parts of agricultural services (SIC 07) noted above.

8/ See figure 1 for a detailed listing of SIC agriculturally related industry codes (SIC 01, 02, and 07).

9/ SRS has only included agricultural services in its regular estimates for all of the U.S. starting in 1977. Prior to 1977 agricultural service establishments were included in the survey sample only once a year and the estimates were not published, except for Florida where they were included quarterly and separate estimates published.

It should be noted that data for agricultural service industries SIC 07 are not published separately from the BLS establishment suvey. Because of the small sample size for this industry group the estimates are included with the Services industry group, thereby resulting in an overlap of coverage between the SRS and the BLS establishment reports. Data for Forestry and Fishery industry groups SIC 08 and 09 are also included with the Services group. While it is not the function of the Committee to make recommendations about employment statistics for these industries, it seems that they have as legitimate a claim on the statistics establishment as any other industry group.

Occupational Classification

Establishments are classified by industry according to their product of major sales. If we know approximately the production processes for the commodity, we have a general notion as to what the majority of workers in that firm do. However, the same establishment may produce a variety of commodities. This is no less true in agriculture than in other industries, where farms with several crop and livestock operations, or production combined with some processing or sales activites are not uncommon. Similarly, specialization of function has occurred to a sufficient degree in some agricultural production firms to permit identification of workers with nonagricultural occupations. Table 1 shows the industry-occupation tabulation from the 1970 Census of Population.

Occupational classification of agricultural workers has not occurred to nearly the extent that it has in other occupational categories. The Census' subclassification within the major occupational group Farm Workers is shown at the bottom of Table 1. Nearly all of the workers are in two categories. (It is interesting to note that the rudimentary classification is not a result of small numbers. The Farm Worker occupational cell within the Agriculture, Forestry and Fisheries industry class is the largest single occupation/industry cell reported in the Census' published two-way classification.)

The Standard Occupational Classification (SOC) currently under development provides for considerably more detailed classification of agricultural occupations, Figure 2. Since this classification will most likely eventually be adopted by all Federal agencies, there is considerable merit in attempting to adopt present classifications to be compatible with that scheme.

Table 1. Occupation of Employed Persons in Agriculture, Forestry and Fisheries, 1970 Census of Population

Occupation	Number of Employed Persons
Total Employed	2,840,488
Professional, Technical and kindred workers	82,465
Managers and Administrators, except farm	25,465
Sales Workers	12,253
Clerical and kindred workers	53,565
Craftsmen and kindred workers	44,879
Operatives and kindred workers (except transport)	29,451
Transport equipment operatives	28,264
Laborers, except farm	178,815
Farm workers*	2,367,055
Service workers, including private household workers	17,814

*Farm Worker Occupational Group Detail and Sub-detail. 1970 Census of Population.

Farmers and Farm Managers	1,418,746
Farmers, owners and tenant	1,279,420
Farm managers	60,556
Farmers and farm managers, allocated	78,770
Farm Laborers and Foremen	948,309
Farm Foremen	32,622
Farm laborers, wage workers	743,219
Farm service workers, self employed	3,983
Farm laborers and farm foremen, allocated	75,743
Unpaid Family Workers	
Unpaid Family Workers Unpaid Family Workers, allocated	92,742

FIGURE 2. AGRICULTURAL OCCUPATION CLASSIFICATION (proposed SOC)

Classification Heading Only

55 Farm Operators and Managers

551 Farmers (Working Proprietors)

5512 General Farmers
5513 Crop and Fruit Farmers
5514 Livestock Farmers
5515 Nursery and Greenhouse Farmers

552 Farm Managers

5522 Managers: General Farms
5523 Managers: Crop and Fruit Farms
5524 Managers: Livestock Farms
5525 Managers: Nursery and Greenhouse

56 Other Agricultural and Related Occupations

561 Farm Occupations: Except Managerial

5611 Supervisors: Farm Workers
5612 General Farm Workers
5613 Field Crop and Vegetable Farm Workers (Hand)
5614 Orchard and Vineyard and Related Workers (Hand)
5615 Irrigation Workers
5616 Farm Machinery Operators
5617 Livestock Workers
5618 Workers in Marine Life Cultivation

562 Related Agricultural Occupations

5621 Supervisors: Related Agricultural Workers
5622 Groundskeepers and Gardeners: Except Farm
*5623 Nursery Workers
5624 Animal Caretakers: Except Farm
5625 Graders and Sorters: Agricultural Products
5627 Inspectors: Agricultural Products

* The Task Force recommends that SOC category 5623, Nursery Workers, be moved to SOC category 561 since nursery products are commonly considered agricultural products and nurseries are in SIC 01.

At their present stage of development, the agricultural occupations of the SOC represent little improvement over the Census categories, since most subclasses are merely subclassifications by industry, (e.g., crop and fruit farmers, crop and fruit farm managers, livestock workers). However the SOC includes the beginning of some real occupational classification (e.g., irrigation workers, farm machinery operators) and it is to be hoped that further refinement of the classification will be actively pursued. Substantially greater skill differentiation exists in agriculture than the presently developed occupational classification schemes suggest. Unfortunately, failure to develop a vocabulary to describe these differences leads persons unacquainted with agriculture to believe agricultural skills are uniform and interchangeable. The Task Force strongly supports further work in agricultural occupational classification.

Since the inception of the probability farm labor surveys SRS has collected data on some broad occupational categories for hired farm workers. The categories presently utilized are: field and livestock workers, packinghouse workers, machine operators, maintenance and bookkeepers, and supervisors. Employment estimates are published for field and livestock workers as a group, and all other categories as a group. Beginning in July, wage rates and employment estimates will be published separately for field workers and livestock workers. Wage rates will be published for field workers, livestock workers, packinghouse workers, machine operators, supervisors and others. In addition, nonhired workers are classified as farm operators (must have worked one or more hours on farm during survey week) and unpaid family workers (must have worked 15 or more hours on farm during survey week). The number of such workers are reported together as "family workers," although separate estimates of hours worked are made for each group.

Self Employment

The notion of a "farm operator," although once a cornerstone of the agricultural enterprise, is becoming more and more a victim of technological and entrepreneurial evolution. Partnerships, corporations (both family and others) and joint ownership/management arrangements of all sorts abound. Currently, it is our understanding that when a partnership or other joint ownership arrangement is encountered, one person is called the "farm operator" and the remainder are classed as unpaid family workers, provided they meet the 15 hour criteria. Defining a single person, or perhaps any person, as farm operator amounts in many cases to a flight of fancy. Furthermore, the concept of farm operator has no direct equivalent in other industries. We recommend, replacing the concept of "farm operator" with the concept of "self-employed." Although this concept is not without practical problems too, it appears more precise than farm operator, and is a concept which has direct counterparts in other industries. The unpaid family worker category would then consist of unpaid members of families of persons classified as self-employed in agriculture.

There are two practical problems associated with defining persons who are self employed in agriculture in statistical surveys. Most occupations, such as selling shoes and brain surgery, are engaged in only as a business, and the mere fact that they are engaged in is evidence of the self-employment.

The few exceptions (mostly in the arts) are too infrequent to be troublesome. However many persons engage in agricultural production essentially as recreation or for subsistence purposes. These persons clearly should be excluded from employment statistics. Self-employment criteria applied in other industries, based upon amount of involvement, are not appropriate to agriculture without some test of the existence of a true profit making intention in this involvement, i.e., a definition of minimum criteria for the existence of an agricultural business. Some development work will be required. Ideally, the definition developed will be reasonably consistent with the definition of a farm and of self-employment in other statistical usages.

The other practical problem is in distinguishing between persons actually employed in agriculture, and resource owners not actually employed. The present scheme effectively averts this problem, because once an individual is identified as a farm operator, all others with self employment interests within the same household must actually work 15 hours during the survey week to be considered employed. Again some developmental work will be required to devise workable definitions.

We would stress that these problems exist now, and are only brought into sharper focus by adopting the concepts of self-employment in place of farm operator. This change in concepts will therefore not raise new problems, but merely raise questions about the appropriateness of existing solutions.

Consideration should also be given the proprietors of agricultural service firms. It is our understanding that only paid employees and unpaid family members are presently counted among the employed for these establishments. Since many of them undoubtedly have working proprietors, these should be counted and included under the self-employed in a manner entirely analogous to the proprietors of agricultural firms.

A Classification Scheme for Agriculture Employment Statistics

The classification scheme suggested in Figure 3 illustrates a classification for establishment employment data compatible with the changing structure of agricultural employment. It is logically possible for all cells to have entries, although at the present time the Census classification--the only one with published data by occupation and industry that includes both agriculture and nonagriculture--does not allow the combination of agricultural occupations with nonagricultural industry codes. The division between agriculture and nonagricultural establishments would come in SIC Group 07 as outlined earlier in this section. All industries should be included.

Five occupational groupings are proposed in Figure 3. Applying earlier recommendations, the first two would be self-employed workers and unpaid workers, in each case classified by industry.

The third major occupational category is managerial and office workers. (The recommendation to designate this category apart form the "production" workers follows the format of nonagricultural employment data). Managerial personnel would be a new category corresponding roughly to what we expect to

FIGURE 3

INDUSTRY / OCCUPATION	AGRICULTURE				NONAGRICULTURE
	Agricultural Production		Agricultural Services		
	Crops (SIC 01)	Livestock (SIC 02)	Some (SIC 07)	Remainder (SIC 07)	All Other Industries (including SIC 08 amd 09)
Self-employed SOC 551					
Unpaid family workers					
Managerial and Office					
Managers SOC 552					
Other office (non-ag SOC)					
Production Workers					
Supervisors SOC 5611					
Field workers 5613, 5614, 5615					
Livestock workers 5617					
Farm machine operators 5616					
General farm workers (SOC 5612)					
Maintenance (non-ag SOC)					
Packinghouse workers (non-ag SOC)					
Related and Nonagricultural Occupations					

be included in SOC Code 552. The "other office" category would include bookkeepers (currently merged with maintenance workers) and other office personnel.

The fourth category is production workers--those directly involved with activities required to generate agricultural products. These would be what are normally thought of as agricultural workers and would correspond roughly to SOC Code 561. Working supervisors are designated as a separate subcategory as they now are. It is proposed that field and livestock workers be separated. Both farm machine operators and packinghouse workers would remain as separate subcategories as they now are. Maintenance workers would be a new subcategory separated from bookkeepers--they are production whereas the latter are office personnel. A final subcategory would include any other agricultural production workers not covered by the previous subcategories.

The fifth and final major group is nonagricultural employees. Currently their numbers are being collected by SRS for agricultural firms, but they are not published. Such data would be informative for the extent to which there are nonagricultural activities by agricultural firms. An equal reporting of the number of nonagricultural employees of agricultural firms would be desirable.

Additions and Retabulations of Existing Data

Additional Tabulations

The Task Force was impressed by the possibilities for utilization of information from the SRS quarterly surveys which is presently collected and analyzed but not published. For example data is available on farm type and economic class and on size of payroll and labor force on farms. Information on type of worker (hired, family, regular and seasonal) as well as limited demographic information is also collected.

The tabulations presented in the quarterly Farm Labor publication represent modification and some expansion of those published from the old voluntary crop reporters' data, and do not fully exploit the possibilities of the new data. While additional detail in state estimates might, in many cases, not be feasible because of sample size, expansion of details at the regional and national level would appear possible. The Task Force could not, in its limited tenure, develop detailed recommendations, but we feel that significant additional knowledge could result from little or no additional expenditure in expanding the estimates and publication from the quarterly surveys.

Data Frequency

Since January 1975, farm labor data have been collected and published quarterly following the development of the quarterly probability survey. Prior to this the data were collected and published monthly. There is no question that the quarterly probability survey is a superior survey procedure related to the previous nonrandom system. However, it is still possible within the quarterly probability survey structure to collect monthly information rather than the information only for the month of enumeration.

It is proposed that employment and payroll data also be collected for the week containing the 12th of the month for the two months preceding the survey. While this would require some recall, it is not for such a long period to be of great concern. Given the vagaries of weather as well as other random unpredictable phenomena that can make a substantial impact on employment in a given week, an entire quarter can presently be "lost" due to grossly abnormal temporary phenomena. The importance of having monthly estimates is particularly acute for a seasonal industry such as agriculture.

Additional data

There are two areas of data coverage in which the Task Force recommends that serious consideration be given to expansion. The first of these relates to fringe benefits and employment costs. (Some data on benefits are collected now but are not published). The BLS nonagricultural employment series include data on the cost of employment. Examples of items included range from Social Security tax contributions to vacation time. Historically, housing or meals have been considered as the usual benefits for agricultural workers. Although there are difficulties in measuring these benefits, efforts to include the cost of such benefits for the labor force would be useful. The need for benefit or employment costs other than wages becomes more important as agriculture moves further in the direction of collective bargaining. Such factors will be of interest to employees as well as bargaining agents. Examples of items which might be included would be the Social Security tax contributions, workmen's compensation taxes, unemployment insurance taxes, minimum employment guarantees, labor housing costs, transportation of workers, meals cost borne by the employer, and health insurance premiums. The criteria for inclusion should parallel the nonagricultural employment series as closely as possible.

The second item for consideration is labor turnover. It is recommended that any consideration of this be limited to year around positions rather than seasonal employment. Again, the specific concepts should parallel as closely as possible the BLS labor turnover data series. The items gathered there are separations, quits, lay-offs, discharges, other separations; accessions, new hires, recalls, and other accessions. The SRS survey is the appropriate survey instrument for this information. However, in contrast to most other employment data, the coverage has to be inclusive over time rather than for a particular reference week. One possibility would be for collection over the quarter rather than concern with monthly information as is the case with BLS data.

There are also two items which currently are on the survey questionnaire that are of questionable value: "How many workers are expected to work less than 25 days in a year?" and "How many of these workers are migrant workers?" The employer is not in a very good position to answer either of these questions. This is a good example of the necessity of both establishment and household data; household data can answer these questions.

Publication Availability

Every effort should be made to publish all information that is collected with meaningful breakdowns and cross-comparisons. (An example of collected but unpublished information is the benefit data). The efforts which have been extended to present data for each state are commendable and should be continued.

On the other hand, if the sample size is insufficient to maintain state data with cross-comparisons, such comparisons should be given at a more aggregate level. Examples of such comparisons are with respect to the size of the farm or the type of farm.

A second consideration is to arrange for release of the basic data for research purposes after adjustment for disclosure problems. It is becoming more and more common for research to proceed with micro level data. Many federal agencies are in the process of regularly making such data available for this purpose after disclosure problems are resolved. Although considerable effort is required the first time this is done, subsequent releases would become routine. The advantage that this has is on avoiding having to prepare special reports for other agencies and then be concerned about release of the data afterwards; the data would already be in the public domain.

The Census of Agriculture

The introduction of Agricultural Services as a part of the Census of Agriculture in 1969 was a major step forward. 10/ With this there is now a broader coverage of agricultural labor by industry in the census similar to the outline presented in Figure 1. The volume on agricultural services is also illustrative of improvements which could be made in the census of farms employing labor.

The Census of Agriculture divides workers into those working 150 days or more and those less than 150 days. This is true for both farms and services. Although this differs from procedures for the other establishment censuses, it is not unreasonable given the nature of the industry and its long tradition. One deficiency of this conceptual measure is that it entails double counting of workers employed on more than one establishment during the year. The alternative would be measurement of the total number of workers at given points in time throughout the year. The latter not only avoids the problems of double-counting workers (for all practical purposes) but also provides information on seasonality. Not to be ignored would be the benchmark information provided for the SRS Quarterly Probability Survey of Farm Labor.

Agricultural Services respondents in 1969 and 1974 were asked for their employment during four quarterly payroll periods. One difficulty with the data obtained was a tendency not to answer this question, and the Census has no basis for imputing estimates. This is sufficiently important information that additional effort should be extended in this direction. It is equally as useful as the number of workers working 150 days or more. A second difficulty is that although in 1969 the survey months corresponded with the current SRS survey months, in 1974 these were changed to March, June, September and December. These months do not correspond with any other Economic Censuses, and they prevent using the Census of Agricultural Services data as a benchmark or comparison with the SRS data.

10/ U.S. Bureau of the Census, Census of Agriculture, 1969, Volume 3 Agricultural Services, U.S. Government Printing Office, Washington, D.C. 1972.

We recommend that the same question on quarterly employment be asked for farms as well as services, and that the survey months for the Agricultural Census and the Census of Agriculture be made to coincide with the SRS survey months.

V. HOUSEHOLD STATISTICS

Household employment surveys can be characteristized as providing economic and demographic characteristics from a people perspective. Unlike establishments surveys, which count individuals who are employed for a specific firm and relate employment and earnings information from the perspective of the firm, household surveys obtain companion information from the perspective of the individual and/or family.

CPS Monthly Estimates and Special Supplements

The Bureau of the Census is the major source of all household data on agricultural employment. The decennial Census of Population and the monthly Current Population Survey (CPS) are the two data generating vehicles. However, the Bureau of Labor Statistics, USDL and the Economic Research Service, USDA each serve as the primary outlet for some of the CPS statistical data. Nevertheless, in constrast to the situation with establishment data, there is general uniformity in concept and method throughout the household based statistical series.

Monthly agricultural employment estimates and associated unemployment data are published by the BLS. Data include estimates of hired, self-employed and unpaid family workers. Industrial and occupational classifications are made by the Census using their classification indices and the respondent's description of the kind of business for whom worked and the kind of work done. The determination of whether the respondent is self-employed at any work is largely determined by the respondent's self perception. It appears that persons self-employed in their own incorporated farm businesses are classified as self-employed. Persons are classified as agricultural if their primary source of employment was agricultural work during the survey week.

Farm employment data are also obtained from the CPS survey. From the ERS control card tabulations are made each quarter of the population living on farms. An annual report based on these data is released jointly by the Census Bureau and the Economic Research Service. It displays demographic characteristics of farm residents and includes counts of the number of self-employed and hired farm workers resident on farms. The annual farm population report, provides estimates of primary source of employment (agricultural and nonagricultural) of farm residents and primary agricultural employment of nonfarm residents pegged to an annual average centered on the month of April. The technique of averaging over several quarters improves the statistical reliability of the farm resident population but does not accurately measure total agricultural employment because persons working in agriculture as a secondary job are not counted.

A special CPS supplement in May, collected for the Bureau of Labor Statistics, provides detail on the characteristics of persons holding more than one job during the May survey week. About 4 million persons were included in this population in 1976. Even though the May survey period is not a period of high seasonal agricultural employment in more than a few commodities, about a quarter of the persons with two or more jobs held one of them in agriculture. Additional analysis of the data collected on the May CPS supplement could shed additional light on multiple jobholding in agriculture.

The Current Population Survey, and the special supplements reviewed above, serve as useful measures of some dimensions of agricultural employment at different points in time and in the context of larger populations. However, all of these surveys are designed primarily for other purposes, and the populations and survey instruments must be designed primarily with these other purposes in mind. As a consequence of seasonality, multiple jobholding and the high incidence of self-employment and unpaid family work in agriculture, all of them share the common characteristic of providing an incomplete measure of the number and characteristics of persons engaged as hired and self-employed members of the farm labor force. This is because the data collected are of the intra-year variety. Intra-year employment data are best suited for measurement of repetitive short-term cyclical and seasonal labor force phenomena. However, this Task Force feels that the central core of a household survey is its ability to obtain a full year's work, labor force participation and earnings history for desired work force populations. Characteristics such as annual labor force participation and earnings levels by occupation and industry, income sources of individuals and families, employment commuting patterns, and the extent of multiple job holding, unemployment, and underemployment are some of the data elements potentially obtainable from annual household surveys. Moreover, they provide the basis for further analysis and understanding of differing labor market structures. Through an understanding of the components of the labor market, and their relationships to its subsequent operation, knowledge is gained which can be applied to increasing the efficiency of labor market processes, i.e. allocation of available supply, and toward improving distribution of income among labor force members.

The Hired Farm Working Force Report

Since 1944, the Census Bureau has conducted an annual survey of hired farmworker households for the Economic Research Service of the Department of Agriculture. These data have been collected and published annually as The Hired Farm Working Force (HFWF) series. Publication has been continuous since 1945 with the exception of 1953 and 1955. The survey is conducted in conjunction with the December CPS each year and detailed monthly work and earnings histories are obtained for all persons who indicate that they have done farm work for wages or salary during the current calendar year. This special survey is the only source of annual people earnings and employment data which compliments annual cost of production data gathered from farm business establishments. A profile for all persons in the hired working force at some time during the year is tabulated annually from these data. Statistics on duration of farm and nonfarm work (in days) and farm and nonfarm earnings, by age, sex, and employment status of persons doing hired farm work are reported annually. Information by two racial identifiers, white, and black and other have been

traditionally reported. Beginning with the report issued in 1976 (The Hired Farm Working Force of 1975) data for persons of Hispanic origin who are doing hired farm work are also being reported.

The HFWF is a rich source of data suitable for gaining additional knowledge of labor force earnings characteristics and other attributes of persons doing hired farm work. Important elements of our knowledge of the hired farm work force have developed from these surveys. For example, this survey represents the only national source of data on the employment status of farm workers, and the role of multiple jobholders, students and migrant workers in the farm work force. It is the only suitable vehicle for monitoring the effects of technological, economic and social change or the effect of current and future labor legislation and regulation on the composition, employment, earnings or other dimensions of the farm work force. However, the potential of this important data source is not being fully realized, in terms of (1) fullest utilization of information currently collected, and (2) utilization of the survey vehicle, and the substantial investment it represents, to expand our knowledge base in special labor force problem areas.

We would first recommend that consideration be given to utilizing more of the base population data in conjunction with the HFWF supplement. Such information as household status of workers, household size and composition, prior employment and/or unemployment experience, and conceivably details of employment during the December survey week could provide valuable insights. In addition some information on farm employment, such as its monthly distribution, is presently being collected but is not published.

The farm labor force data collected on the December CPS supplement includes only persons doing hired farm work. Our second recommendation is that consideration be given to the feasibilty and value of expanding the survey population to include annual work histories and other comparable data on the self-employed component of the farm work force. The universe for the hired segment of the farm work force now represents over 8 million hired farm workers and household members. Expansion to include self-employed farm worker households would bring an additional to 6 to 7 million individuals within the scope of the survey. The major weakness of the present survey is the limited CPS sample size from which estimates of the universe are made. Recent expansion of the CPS sample will largely overcome these weaknesses. The addition to this survey of all self-employed farm workers would provide a comprehensive agricultural manpower survey including, among others, hired workers seasonally employed in agriculture and self-employed farmers with primary employment in the non-agricultural sector.

It was noted at the outset of this report that one of the obligations of agricultural labor data is to shed light on those topics which are unique to agricultural employment. Most of the series reviewed in this report are primarily directed at other objectives, and agricultural labor force data are a secondary consideration. However, the December CPS supplement is a specialized instrument designed to measure the unique characteristics of agricultural employment. Thus, our third recommendation is that a continuing series of special labor force studies be conducted by the Economic Research Service with

the December supplement data similar to the recent study "Social and Economic Characteristics of Spanish Origin Farm Workers. 11/

Candidate subjects for such studies are numerous. As noted earlier, many diverse groups comprise the hired farm work force. Persons under 25 years of age are the single largest identifiable group doing hired farm work. They account for 60 percent of the total. Students, who account for about 40 percent of all persons with hired farm work make up an important subgroup of youth who work in the farm sector. During the recent period of decline and leveling off of persons doing hired farm work, the proportional representation of youth has increased, implying that this group exhibits a high rate of entry into and exit from the agricultural labor force. These implications, as they relate to rural manpower policy, require further study. Should young persons be discouraged from doing hired farm work or should they be encouraged?

While the attachment of many workers to the hired farm work force (in terms of days of farm work) appears to be increasing in the western states, the midwestern states have been using increasing numbers of short-term workers. 12/ How do entry and exit patterns differ among these groups? What are the implications of these entry and exit patterns for labor market organization and labor recruitment?

Almost half of all persons with hired farmwork who are in the labor force for most of the year and 40 percent of all migratory workers, combine farm jobs with nonfarm work. In addition, self-employed farm work constitutes about one fourth of the jobs held by multiple job holders. Of what importance is income earned from farm work for these persons? What is the importance of nonfarm work? What are the implied labor supply, income and public welfare implications if more people are encouraged to become primarily farm workers? Why do workers seek nonfarm work to supplement farm earnings? To what extent is employment in the nonfarm sector the major income source? What are the implications of this for the functioning of labor markets in rural areas? Answers to these questions can provide important insights for the design of public employment programs in rural areas.

Finally, persons operating subeconomic farm units in isolated rural areas suffer from problems of low income and underemployment which require specific remedial measures to overcome. Expansion of the December survey to include self-employed workers will make possible the documentation of the earnings of these rural residents.

Consistent net population increases in rural areas have been noted in recent years. 13/ If continued into the future, these changes can have dramatic

11/ Leslie Whitener Smith, "Social and Economic Characteristics of Spanish Origin Hired Farm Workers in 1973," AER No. 349, Econ. Res. Serv., USDA.
12/ Data taken from The Hired Farm Working Force, Econ. Res. Serv., USDA, various issues.
13/ Beale, Calvin L., A Further Look at Nonmetropolitan Population Growth Since 1970, Amer. Jour. of Agri. Econ., December 1976.

and significant implications for rural employment and manpower policies and for the well-being of the farm oriented population. Not since the mid-1930's have the issues of rural population and employment growth been of greater importance. (In fact, until recently, rural manpower policies had been designed to encourage the depopulation of rural areas.) Under the newly emerging growth conditions, the expansion of the scope and analytic content of the current household data series relating to the income and employment aspects of the farm oriented population takes on special significance. A continuing and improved knowledge base of all persons in the farm working force is imperative if we are to maintain and improve income, manpower and employment policy capabilities for people working in one of the more vital sectors of the rural economy.

LITERATURE CITED

(1) BLS Handbook of Methods. Bulletin 1910. U.S. Department of Labor, 1976.

(2) Beale, Calvin L. A Further Look at Nonmetropolitan Population Growth Since 1970. American Journal of Agricultural Economics, December 1976.

(3) 1969 Census of Agriculture. U.S. Department of Commerce, 1972.

(4) 1970 Census of Population. U.S. Department of Commerce, 1972.

(5) Classified Index of Industries and Occupations, 1970 Census of Population. U.S. Department of Commerce, 1971.

(6) Current Wage Developments. U.S. Department of Labor.

(7) Dictionary of Occupational Titles, Third Edition. U.S. Department of Labor, 1965.

(8) Employment and Earnings. U.S. Department of Labor.

(9) The Hired Farm Working Force. U.S. Department of Agriculture, various issues.

(10) The Monthly Labor Review. U.S. Department of Labor.

(11) Smith, Leslie Whitener. Social and Economic Characteristics of Spanish Origin Hired Farm Workers in 1973. AER No. 349. U.S. Department of Agriculture, 1976.

(12) Standard Industrial Classification Manual. Office of Management and Budget, 1972.

(13) Standard Occupational Classification Manual, (Draft). Office of Management and Budget, 1976.

(14) Standard Terminology for Curriculum and Instruction in Local and State School Systems. Handbook VI. U.S. Office of Education, 1969.

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