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ABSTRACT

This volume contains four papers presented at a 1982 conference sponsored by the National Council on Employment Policy. It begins with a brief policy statement warning that labor force and productivity data systems face deterioration because of budget cuts that have forced a decline in the quality and quantity of the published information and curtailment of needed research. Each of the papers, presented by a leading economic or statistical analyst, examines one part of the system. The first, by Leon Taub, explores the extent to which the Current Population Survey can aid in answering key policy questions relating to macroeconomic, labor market, and welfare issues. In the second presentation, by Robert Taggart, new measures of labor market-related economic hardships are proposed to supplement existing labor force and poverty statistics. The third paper, by Elliot Grossman and George Sadler, cautions that conventional productivity measures concentrating on labor are overstating productivity growth. To properly capture the substitution of capital for labor and labor for capital, the need for up-to-date measures of total factor productivity is emphasized. The fourth paper, by Orley Ashenfelter and Gary Solon, emphasizes that longitudinal data collection should not be halted, since such data provide insights unobtainable from cross-sectional data. A conference summary, by Sar A. Levitan, based on selective hearing is also provided. (YLB)

What's Happening to American Labor Force and Productivity Measurements?

Proceedings of a June 17, 1982 Conference Sponsored by The National Council on Employment Policy

The W. E. Upjohn Institute for Employment Research

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Foreword

The papers presented at the conference held last June, together with the policy statement of the National Council on Employment Policy, serve to highlight the importance of labor force and productivity data systems as a resource for policy formulation. They also address the concerns of many about the adequacy and viability of these systems.

According to the Council, the federal government in fiscal 1983 will be spending 20 percent less than it did in 1980 for labor force and economic data, forcing a decline in the quality and quantity of many data series and curtailment of needed research and development. While it seems obvious that the relative costs and benefits of data systems must be analyzed in an era of budget constriction, it seems equally obvious that data systems which accurately capture the net social impacts of domestic policy are of vital importance to both policymakers and the general public.

Facts and observations presented in this study are the sole responsibility of the authors. Their viewpoints do not necessarily represent the positions of the W. E. Upjohn Institute for Employment Research.

Jack R. Woods
Acting Director

Kalamazoo, Michigan
December 1982

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Introduction

What has been happening to the United States' labor force and productivity data systems? That was the major question examined at a conference sponsored by the National Council on Employment Policy held in Washington on June 17, 1982. The Council, a private nonprofit organization with special interest and expertise in the areas of labor market and employment and training programs, set out to examine whether the basic concepts and definitions used in collecting and reporting labor force and productivity data portray current conditions and whether the available data are adequate for policy formulation and evaluation processes.

Joining Council members at this conference were leading public and private economic and statistical analysts. The debate during the conference over these issues and the material presented in the four main Council-sponsored papers was enlightening and informative, but often also heated.

American social and economic policies in the early 1980s have experienced significant changes. The conference explored how existing statistics have been, and can be, used by policymakers in reaching key decisions. But beyond the quality and quantity of existing data, the conferees examined critically the strengths and weaknesses in the American labor force data system.

This volume contains the papers presented at the conference. As published, the papers reflect the comments and critiques presented during the course of the deliberations. Based on the proceedings, the Council prepared a brief policy statement, "Labor Force and Productivity Measurements: Danger Ahead." The Council concluded that the United States' labor force and productivity data systems face deterioration because of a "starvation budget" which has forced a decline in the quality and quantity of the published information and a curtailment of needed research.

While each paper examined one part of the system, the Council's statement tries to view the system as a whole. It places American labor force and productivity data measurements in the context of recent federal budgeting developments. It took many years to create the system, the Council cautioned, and it could lose the trust of policymakers and the general public if it is allowed to deteriorate.

No econometric model or policy evaluation can be better than the data on which it is founded. Ideology and basic values will always play a significant part in this process. However, sound data can provide a tether that links policymakers, the media, and the general public with reality. It is the Council's hope to strengthen this tether and to point out where it has become weak and may fray unless action is taken.

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Labor Force and Productivity Measurements
Danger Ahead

A policy statement by
The National Council on Employment Policy*

Growing Concern

The United States' labor force and productivity data system faces a serious problem of deterioration at a time when the American economy is experiencing radical transformations. Changing public policies, combined with slumping productivity and other technological and social forces, are buffeting our society. Compounding the domestic factors is a growing internationalization in the flows of capital, commodities and labor, making the United States increasingly cognizant of foreign economic conditions.

Given these changes and more recent shifts in social programs, federal spending, taxes, monetary policy and international markets, measures are necessary to assess the impact of these transformations. Who in our society has been

*The National Council on Employment Policy is a private nonprofit organization of academicians and policy experts with a special interest in the areas of labor market and employment and training programs. This policy statement represents the combined judgment of the Council members. Despite divergence of opinion on details, the members unanimously agreed to this statement.

helped by the new economic policies, and who is experiencing more economic hardship? What tools are available to track the resulting changes? What sectors have experienced gains in productivity, and what factors have caused these increases? Our public policies and private investment decisions depend upon these data as billions of dollars literally are riding on the monthly labor force estimates published by the U.S. Department of Labor's Bureau of Labor Statistics (BLS). An annual rise of 1 percent in unemployment can unleash various forces that can increase the federal deficit by some $25 billion, affecting not only millions of lives but also domestic and foreign financial markets—which in turn feed back on labor market results. Also, estimates of local unemployment, income and related data determine the size of allocations for many federal programs.

The thermometer of labor force and productivity measurements has taken on an added importance. While politicians cannot rely solely upon statistics, it would be foolhardy to try to fashion economic policies without considering their impact on the workforce and households as summarized in our labor force data system. It is no wonder that President Reagan has displayed an interest not only in overall labor force data but even in the seasonal adjustment of labor force estimates—one of the most arcane aspects of these data.

At a time when we need reliable labor force and productivity data, clear danger signals have emerged. First, some basic concepts have not been updated since the 1930s despite vast social and economic changes. Second, while our data system may not be exempt from budget reductions, there are some cost cutting moves that may save money in the short run only to wind up costing the nation more in the long run. Our labor force and productivity estimates should be able to play a major role in public policy formulation and in helping

to evaluate the results of these efforts by providing feedback to alert policymakers concerned with possible mid-course corrections.

In general, there is much to be proud of in our workforce data system. However, there are indications that inertia may be setting in despite the best efforts of many competent and dedicated government experts. Yet, the data system can be expanded and kept up to date with minimal costs to help shed light on the formulation and evaluation of economic policies. Our data system will deteriorate if we cannot redesign and modernize it. Depreciation is a factor in this social investment, just as in our system of public works and private capital.

All this indicates serious potential problems. It should be remembered that no law forces households or employers to participate in the government surveys which generate these data. Without full public support and trust, the system would fall apart very rapidly. However, policymakers, the media and many citizens have increasingly questioned this data system. It would be wise to consider these rumblings, for they indicate serious potential problems.

The good news is that the American labor force data system and productivity estimates remain free from partisan political influences. On a methodological level the system remains one of the world's best—and in many ways number one—in terms of statistical sampling techniques and the utilization of computer technology and analysis. This data system still represents a standard of excellence that most other nations strive to emulate.

The bad news is that the system has been far slower in adopting basic concepts and definitions to reflect current economic conditions and workforce behavior. This lag has reduced the system's usefulness in the policy process.

Economic Hardship

Our current labor force data system often falls short of providing the necessary information for policy formulation. It is not just a question of whether or not the unemployment rate should be jiggled up or down. The real problem centers in on the basic concepts of what we should measure.

One of the major areas in which the American data system has experienced the most inertia concerns the concept of economic hardship. Basing public policy on indices measuring the number of people employed and those not employed but looking for jobs might have been adequate in the 1930s, but it does not provide the data needed in the 1980s. Given the massive size of the government's income support system, the conditions of the working poor, and vast changes in the composition of the labor force, we should move beyond the assumption, contained in our current statistics, that people are either employed or forced into idleness.

In the pre-New Deal days when few needy individuals received income support and people either worked or starved, these concepts reflected reality. But, for better or worse, we do not live in such a society. What is required for meaningful analysis and public policy direction are new social indicators that would not only measure employment, but would link earnings and income data with labor force status, time worked and household living conditions. Such indices would tell us the number of persons who are unable to attain a socially acceptable standard of living through work.

When the government started its monthly effort to measure unemployment toward the end of the Great Depression, economic hardship was more directly correlated with unemployment. Under the conditions of the 1930s, any job—no matter what the rate of pay or hours of work—was considered better than no job. Hence, the length of the ranks

of the unemployed was an acceptable proxy measure for deprivation.

The American economy has undergone major institutional change since the 1930s, and yet the concepts and definitions used in forming the unemployment statistics have hardly changed at all. The American economy now includes a vast transfer payment system carrying an annual price tag in excess of $380 billion—or one out of every six dollars of disposable personal income. Public transfer payments have an impact on all segments of society, and in fact the vast majority goes to the middle class and affluent. Our concepts about labor force behavior reflect conditions of the Great Depression and are not necessarily applicable to today's labor markets. For example, an individual may be unemployed and yet receive income support, or be part of a household with income that may indicate affluence.

However, there is another side to the coin. For millions of Americans, employment—even a full-time job—does not offer escape from poverty. An individual may be employed and still live in poverty as defined by the federal government. A statistical system that reports labor force participation monthly but pays only scant attention to income and underemployment is bound to fail as an indicator of real conditions. We are bound to draw disastrously wrong conclusions when we use such a statistic as a foundation for governmental policies.

It is ironic that meteorologists have recognized a similar problem in their field, and they have devised solutions which the public uses every day. For example, what makes us uncomfortable during a winter day? The meteorologists' concept of the "wind-chill" factor combines temperature with wind data to produce a realistic and understandable measure of actual outdoor conditions. The older measure, temperature, simply does not convey enough information

about windy, chilly days. On summer days, the termperature-humidity index combines the factors that make us uncomfortable. By itself temperature might not make us uncomfortable, and it must be placed in context with other factors.

A similar concept should be applied to employment, earnings, and household data to provide a realistic measure of labor market-related economic hardship. The impact of government policies—and the extent to which economic hardship has been increased or reduced—cannot be determined until we forge new statistical concepts for labor force measurements. Consider two individuals: person "A" works full-time, full-year at minimum wage and is the only wage earner in the family. Person "B" has just been laid off, but is part of a two-person household with the other member earning $25,000 a year. Common sense would indicate that "A" should be considered in the economic hardship ranks while "B" would not be facing deprivation. And yet under our current concepts "B" is counted as unemployed and therefore presumably in hardship while "A" would not be included in our leading measure of labor market pathologies. The unemployment statistics provide a shaky foundation for deciding national policy, and they are even of less value in deciding the allocation of federal funds among states and local areas.

Congress has recognized these problems on several occasions and has mandated BLS to come up with labor market-related hardship measures.[1] However, BLS has been very slow to comply, and its recent first report on the subject fell short in meeting the concerns expressed in the congressional mandate.[2] A reporting system that would link labor market

status with earnings and income should attempt to measure at a minimum:

—*Inadequate individual earnings:* How many persons who participate in the workforce during the year are unable to earn at least the minimum wage equivalent for their total hours of work availability?

While individual data are important, it is necessary to place a person's earnings in the context of their household status and family economic need. For these reasons, a reporting system should also measure:

—*Inadequate family earnings:* How many workforce participants are in families whose total wages and salaries are below the poverty level?

—*Inadequate family income:* How many workforce participants have family incomes (i.e., earnings plus any transfer payments and certain in-kind aid) below the poverty level?

The answers to the above questions can be derived annually from existing labor force data at a minimal cost. The resulting reporting system can provide important insights into labor force operations,[3] including:

—One of every four workforce participants failed to earn the equivalent of the minimum wage for the hours the person was available for work during 1979. This count of inadequate individual earnings was nearly 5 times the average monthly unemployment level and 1.5 times the number who experienced any unemployment during the entire year.

—One of every nine workers lived in families with below-poverty earnings. The number of workers with inadequate family earnings was more than double the average annual unemployed and almost three-quarters the number who experienced any unemployment during the entire year.

—6 percent of the workforce remained in poor families after receiving income transfers and other earnings supplements.

—Only half of those who experienced joblessness during 1979 had annual earnings below the minimum wage equivalent for the hours they were available for work. Less than one in four resided in families with below-poverty earnings. Only one in seven remained in poverty after receipt of transfer and other earnings supplements.

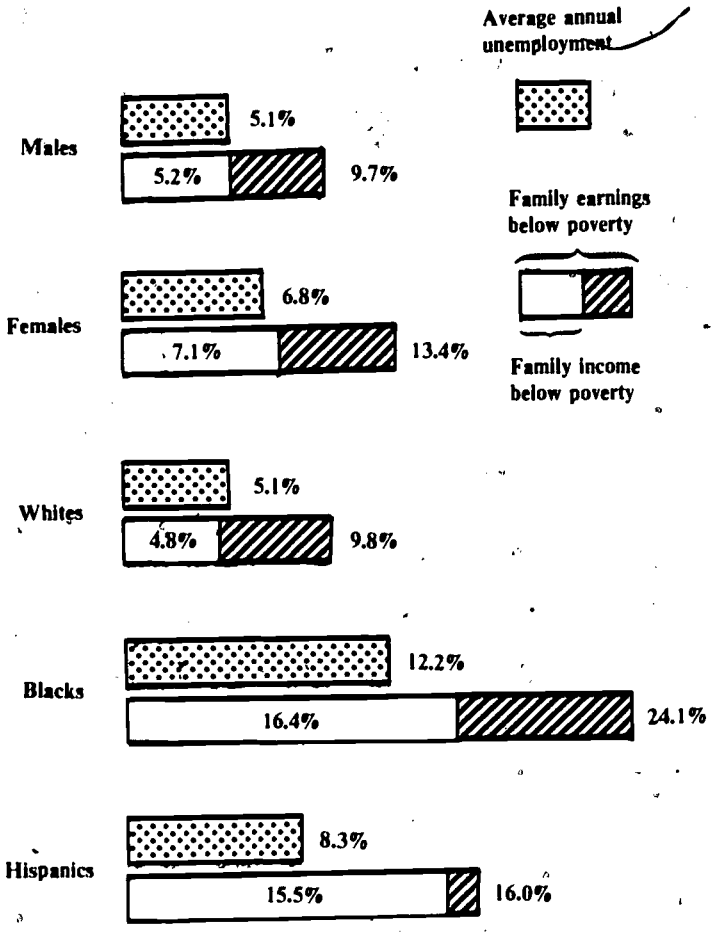
—Low hourly earnings and limited hours of employment, rather than joblessness, were the major causes of economic hardship. Four of every ten poor persons above age 15 worked in 1980 including 2.7 million low-paid workers employed full-time year round who lived in families with below-poverty earnings.

These data illuminate many concerns expressed by labor market analysts regarding the meaning of labor market status and economic hardship in our society. These same measures also show that:

—The incidence of inadequate earnings and income is most prevalent among female workers, minorities, younger and older labor force participants, and those with limited education, workers in service jobs, and residents of nonmetropolitan areas and large central cities. As a general rule, the burdens of hardship are more maldistributed than the burdens of unemployment (Figure 1).

—Economic hardship is a continuing structural problem, rising and falling over the business cycle, but changing proportionately less than unemployment. Between 1979 and 1980, when average annual unemployment rose by a fourth, the number of individuals with earnings below the minimum wage equivalent rose by only a sixth and the number of workers in families with below-poverty earnings by a seventh.

Figure 1. The Rate of Economic Hardship is Higher Than the Rate of Unemployment for Female and Minority Labor Force Participants (1980)



SOURCE: Robert Taggart, *Hardship: The Welfare Consequences of Labor Market Problems* (Kalamazoo, MI: The W. E. Upjohn Institute for Employment Research, 1982).

—During the most recent complete business cycle, between 1974-1980, the poverty incidence among workforce participants increased because of the declining effectiveness of the cash transfer safety net.

—These data indicate that to significantly alleviate labor market-related hardship would require a combination of macroeconomic and targeted structural measures, combined with expanded income transfers for the working poor. Economic recovery alone will not solve the economic hardship problem of labor force participants. Assuming a 9 percent unemployment rate in 1982 and a 5 percent inflation rate, an estimated 17 million workforce participants are in families with earnings below the poverty level. But if the unemployment rate fell to 7 percent and the inflation rate to 2.5 percent, the number of workers living in poverty households would drop by less than 2 million, and their families would still need nearly $45 billion in earnings or supplements to escape poverty.

This briefly summarized system of measuring the labor market-related hardship is an indication of what can be done with available CPS data and minimal expenditures. For all of these reasons, *we strongly recommend that our official labor force measurement system should include indices linking employment with earnings and income along the lines suggested above.* Policymakers need relevant data to form and evaluate public programs. The lack of such hardship estimates is a major weakness in the current system.

Productivity and Social Indicators

Another major area of concern focuses on American productivity data. Given the recent problems with slow growth, inflation and unemployment, policymakers have become highly interested in productivity growth rates, and they have

issued numerous proposals to boost the slumping American trends.

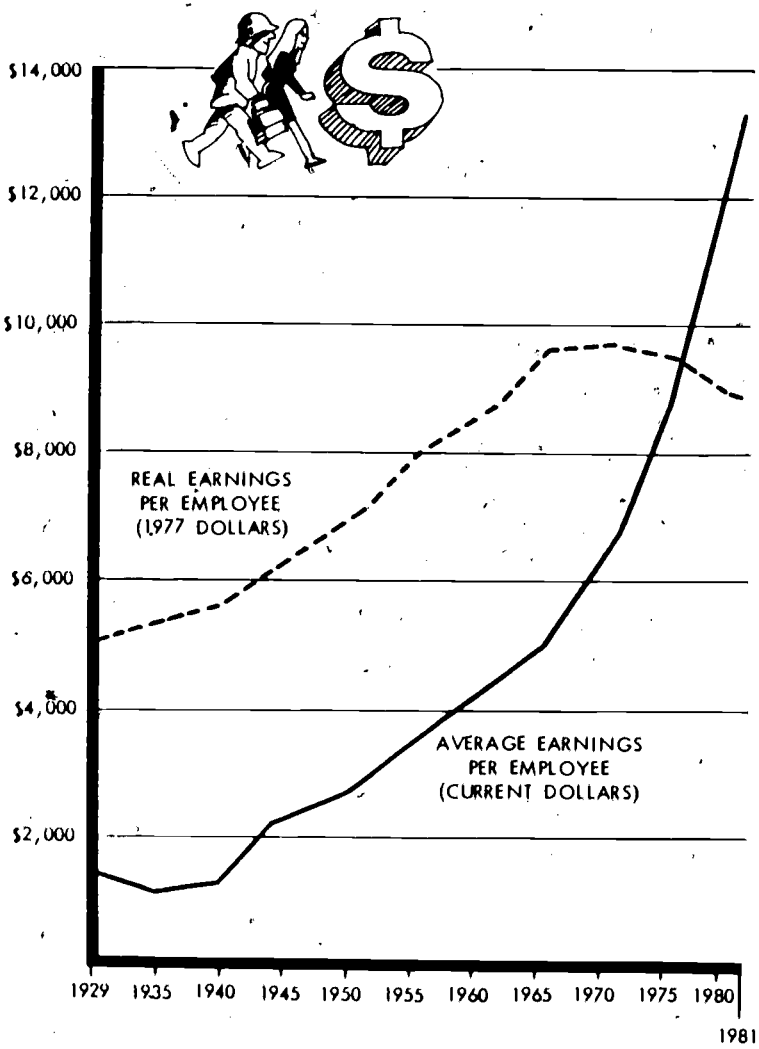
The traditional concept of productivity considers only output-per-workhour. In 1981 output-per-workhour, known as labor productivity, of the private business economy rose at only one percent—compared with a threefold increase in labor productivity between 1948 and 1973. By the end of the 1970s, not only were labor productivity growth rates slumping, but at times they were even negative.

It is commonly assumed that the health of the economy cannot be restored, and real wage gains cannot be resumed, until productivity growth rates rise commensurately (Figure 2). At the same time concern is expressed that the United States has lost some of its former competitive advantage over foreign nations due to the fact that their productivity growth rates have tended to be higher than America's. There also has been a major shift of the American workforce into the service sector of the economy, and it is much more difficult to measure productivity in this area than in manufacturing or agriculture. Even when measured, there is also serious concern that it may be much more difficult to raise the output-per-workhour in the service sector.

With so much interest expressed in productivity growth rates, the data used to measure productivity must face as close an examination as the concepts of linking employment with earnings and family income. Also in this field there have been major advances in the basic concepts of how productivity should be measured. The more recent concepts center on total factor productivity rather than on only labor productivity. Yet these advances still have not been reflected in our official data system.

Output-per-workhour, based on establishment survey reports submitted voluntarily by some 165,000 employers,

Figure 2. Average Annual Compensation Per Full Time Equivalent Employee Rose Steadily Until the Mid-1970s



SOURCE: Bureau of Economic Analysis, U.S. Department of Commerce.

does not fully take into consideration or show the influence of other factors such as capital. A different picture emerges by looking at total factor productivity which relates output to all associated inputs. Suppose, for example, that the labor required to produce a bushel of wheat vastly declines. Instead of human labor power, the farming process might become highly energy-intensive (i.e., energy, such as oil, petroleum-based fertilizer, and machinery, is substituted for human labor power). Total factor productivity would not rise as much as output-per-workhour in this case. Given the recent hikes in energy prices, the substitution of energy for labor cannot be ignored.

Conventional productivity measures, which concentrate on labor, may be overstating productivity growth rates. In 1981, total factor productivity rose only 0.4 percent, or 60 percent less than the BLS output-per-workhour figure. Moreover, the establishment survey is designed so that it obtains better productivity data within the goods producing sector of the economy rather than in the more rapidly growing service sector. In fact, productivity is much more difficult to estimate within the service sector because of the difficulty in measuring units of production.

There are many conceptual and data problems in forming total factor productivity estimates. For example, how is capital to be aggregated and measured? How should capital stock be depreciated so that net capital levels are used in forming these estimates? The BLS has undertaken research into these questions, and it does hope by 1983 to make estimates that move beyond only labor productivity.

Similar to the area of unemployment, productivity analysis all too often has been hampered by a "one number syndrome." Labor productivity, like the official unemployment rate, is presumed to illuminate developments it was never designed to handle. Labor productivity estimates

measure the change in labor spent per unit of output over time, and this may be all that is required for some analysis. However, for certain investment and growth policy decisions capital, labor and energy substitutions cannot be ignored, and it is significant to look at a combined measure of all input requirements per unit of output over time.

We support BLS efforts to publish productivity estimates that not only include output-per-workhour but indices that also report total factor productivity, capital productivity, and energy productivity.

We also recommend that efforts be expanded to revise the establishment survey so that it will better capture productivity and other changes within the rapidly growing service sector.

There are many reasons which can explain the recent decline in American productivity growth rates, but one key factor centers in on the concept of externalities—which often are only measured by our social indicators. For example, prior to environmental laws a firm may have produced a ton of metal per hour plus an unhealthy level of pollution. Capital investment to clean up the air may now result in the firm producing a ton of metal per hour plus a safer environment. However, conventional productivity estimates will not capture this change since they only look at private productivity levels and not at social productivity that includes externalities.

Social indicators are required to augment the formal economic data on the labor force. Public investment has played a significant role in developing these newer data sources. *In general, this public investment in social indicators has been sound, and should be continued.*

Longitudinal Data

The current population survey and the establishment survey—the two main samples discussed so far—are most often used to create cross-sectional data, which are like a snapshot taken at one point in time. Several pictures can be placed together for a time series, which shows changes over months and years. While this provides policymakers with more information, it has problems. The individuals in each time series observation are, most often, not the same people. For this type of information, longitudinal data which follow specific individuals over time can provide a wealth of knowledge. Longitudinal data can help in such policy related questions as:

—What happens to families when they go through a divorce? What happens to labor market activity and earnings? Are the children reduced to poverty?

—What are the benefits and costs of specific employment and training programs for different types of individuals? What seems to work best and for whom?

—What is the full impact of business cycle conditions on different types of households?

—What are the net impacts of workfare and welfare programs?

Some of the most important policy-related questions can best be answered by longitudinal data. Part of the reason most econometric models failed to predict the major influx of women into the workforce was because their estimates were based on cross-sectional data on such variables as a wife and husband's educational and earnings status. The cross-sectional picture proved to be misleading.

The federal government has been the major sponsor of longitudinal data series. From the point of view of policy formulation and evaluation, longitudinal data collection and analysis are highly productive investments of research dollars. There has been some concern expressed by leading labor force analysts that, in an effort to cut domestic spending, these efforts will be vastly reduced. *It would be a serious mistake to trim investment in the collection and analysis of longitudinal data.* The fixed costs of beginning or restarting the collection of data loom much larger than continuing longitudinal sets once started. Research on the labor force and work-related issues would consequently suffer if longitudinal data collection were halted or significantly reduced.

Also, different federal agencies are the sponsors of various longitudinal surveys. *Given the diversity of sponsorship, it is important to have a means for fostering coordination so as to avoid both overlap and omission.* While cross-sectional data can tell us "how many," longitudinal data centers on "who," "why," and "do policies make a difference?" Sound social investment in data should include significant allocations to these newer surveys.

We also believe that administrative data can be put to much better uses than they are currently given in many cases. The administrative data are already being collected as part of program operations, and they often can provide a rich longitudinal data source. In some cases administrative data remain an untapped gold mine. *Government agencies should further explore linking administrative and survey records.*

Misplaced Savings

While strict budget constraints have been applied to most areas of nondefense spending, there are indications that certain recent decisions in the area of labor force measures may

be penny wise but pound foolish. For example, six years ago Congress mandated the establishment of a commission charged with the responsibility of reviewing the federal employment and unemployment statistics. Following the requirements of the law, in October 1981 Secretary of Labor Raymond Donovan reported on the disposition of the National Commission on Employment and Unemployment Statistics report. His conclusion was that because of budgetary constraints, he would not implement the commission recommendations that involved added outlays—no matter how miniscule the costs and regardless of the potential returns.[6]

Recognizing that this is a period in which policymakers are reducing public efforts, we believe that the "savings" involved here are not justified even in an era of fiscal constraint. Policy decisions should not be based solely on gut feeling or preconceived ideology. Given the vast interest, scope, and billions of dollars involved in productivity, training and other labor-related policies, it makes sense to invest in a data system that produces sound and relevant estimates.

A major tenet of the Reagan administration has been the desirability of generally reducing the powers of government and assigning tasks to the lowest possible levels of government if government intervention is deemed necessary. Realizing, however, that the federal government cannot give up all its responsibility of aid to states and localities, the Reagan administration has favored the disbursement of federal funds to states through block grants. Yet it would seem to be unwise for the federal government to leave the money in state capitols without giving them some guidance and a helping hand in its disbursement. Economy would certainly not be served if each state developed its own data base. Accordingly, if the federal funds are to be distributed on the basis of helping the truly needy or the dependent population, then it will be necessary for states to possess the necessary

statistics on which to base allocation decisions. Cognizant of the costs, the commission still recommended that the present 60,000 household sample of the Current Population Survey (CPS) be doubled. The current CPS cannot even come close to accomplishing the job of helping states and local governments make wise decisions based on facts.

But even to keep the CPS a true random sample—and to provide state and local data not now available on such a disaggregated level in the CPS—our data system requires detailed Census numbers. The 1980 Census cost more than $1 billion in 1980, and yet the funds to process and tabulate the state and local data were not provided at the level needed to meet publicly announced time schedules.

These state and local data are crucial to many other data series. BLS uses Census data as a benchmark for its sample survey data. Without an accurate benchmark, the reliability of estimates produced by a sample survey cannot be verified. At the same time, these disaggregated estimates are needed to form policies that move beyond our general macroeconomic plans. Many of our difficulties should be addressed on the microeconomic level, but data from sources such as the CPS often are not good enough to accomplish this needed task.

There are numerous signs that our labor force data system appears to be in for some tough times. There is a major difference between rational budget restraints and a starvation diet. The irony is that the latter, in the long run, will wind up costing us more money than the former.

For example, an investment of funds in the redesign of the Current Population Survey will not only save millions of dollars in operating costs over the next decade, but it would also assure the maintenance of the quality of the critical statistics which come from this source. Without a redesign, the quality of the data—on which so many national and state

and local decisions are made—can be expected to deteriorate over time.

In fiscal 1983 the federal government will be spending about 20 percent less than it did in 1980 for labor force and other economic data—and this estimate does not even include the impact of inflation. We believe that BLS Commissioner Janet Norwood got to the heart of the matter when she recently said:

> There is a problem with a statistical system that stands still and doesn't do new things to keep up with the state of the art. You are really deteriorating, and in five years you can be a has-been; the whole statistical system in the United States could be that way.

We agree with Commissioner Norwood that the system faces two basic forms of deterioration. BLS already has been forced to reduce or eliminate the industry wage survey, the family budget survey, occupational outlook, strike statistics, and labor turnover data. Many users of these and other labor force data are just starting to miss these important data.

Even with massive budget reductions, BLS has been able to maintain the basic core programs including labor force status, prices, wages and productivity. However, sound policies require more than mere grinding out of data. The system will become obsolete if the analysts are not offered opportunities to innovate and experiment. This second form of deterioration could wind up being an even more serious problem than the first form.

While public regard for numerous national institutions has declined, our labor force statistics system has retained the faith of the vast majority of Americans. The reason this information system is so widely used by the government, private industry, unions, the media and researchers is

because it is prepared by a dedicated and highly competent cadre of experts, and it retains a high level of public confidence. It has taken years of hard work and nonpartisan dedication to build up this good will and public confidence. If this trust is lost—due either to inertia or lack of funds—then public confidence will not be easily regained.

NOTES

1. The National Commission on Employment and Unemployment Statistics, *Counting the Labor Force* (Washington: Government Printing Office, 1979), chapter 5.

2. Bureau of Labor Statistics, *Linking Employment Problems to Economic Status* (Washington: Government Printing Office, 1982), Bulletin 2123, p. 2.

3. Robert Taggart, "The Hardship Consequences of Labor Market Problems," chapter 4 of this volume.

4. Elliot S. Grossman and George E. Sadler, "Establishment Data and Productivity Measurements," chapter 5 of this volume.

5. Orley Ashenfelter and Gary Solon, "Longitudinal Labor Market Data: Sources, Uses, and Limitations," chapter 6 of this volume.

6. Raymond J. Donovan, *Final Report of the Secretary of Labor on the Recommendations of the National Commission on Employment and Unemployment Statistics* (Washington: Government Printing Office, 1981).

7. Leon Taub, "Policy Analysis and the Current Population Survey Data," chapter 3 of this volume.

8. Jonathan Fuerbringer, "Washington Watch: Cutting Funds for Statistics," *The New York Times,* August 2, 1982, p. D-2.

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Policy Analysis and the Current Population Survey Data

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Introduction

The Current Population Survey (CPS) provides a wealth of data on labor force and employment conditions within the U.S. economy. Every month its importance is highlighted by one of the most widely quoted U.S. economic statistics—the previous month's unemployment rate. Expansion of the survey in terms of the number of people covered and the number of questions asked has led to the regular publication of detailed indices of unemployment rates by type of occupation, by major industry and class of worker, by age, sex, and race, by region and by reason of unemployment. The additional information on the labor force has led to the provision of a smorgasbord of unemployment measures based upon varying definitions of unemployment and labor force.

As important as the monthly unemployment rate is, my focus on it thus far may have the effect of understating the breadth of the CPS data for statistical analysis for two important reasons. First, the collection of the sample involves the surveying of the same household for eight months, with an additional eight month break in the middle. Thus the data base contains a significant amount of longitudinal as well as cross-sectional time series information. Second, the supplementary surveys and data, particularly the March ques-

tions on family income, add a wealth of additional information. For these reasons, the CPS data base is one of the most valuable data sources in the United States.

The Key Policy Questions

Each of us has his/her own mental list of key economic policy questions. Some of the major types of questions, presented in an order which relates to my presentation but not meant to imply any judgment of relative importance, are:

Macroeconomic Questions

(1) How much national income has been/is being lost due to the incomplete utilization of labor?

(2) To what extent is "tightness" in the labor markets adding to inflation?

Microeconomic/Programmatic Questions

(3) To what extent are labor market imperfections impeding economic growth?

(4) To what extent do transfer payments reduce employment and job search incentives?

(5) How many unemployed workers could be aided by alternative programmatic actions?

Sub-national Data Questions

(6) What major occupation/skill classifications and regional locations show the greatest job vacancy/unemployed worker imbalances?

Social/Personal Questions

(7) What are the social and personal costs of current unemployment levels?

While this list is certainly not exhaustive, it is indicative of the types of important policy questions which can be asked. The first two questions—lost income and inflationary

pressures—reflect the macroeconomic costs of employment changes. The next three questions reflect microeconomic level questions and programmatic issues. Alternative programmatic actions include the traditional questions of direct employment versus training subsidies versus trickle down programs versus public works spending. The issue of personal incentives has already become a key determinant of policy as it affects "rich" people who once faced marginal tax rates of 50 percent to 70 percent. Someday "supply side" economics may be applied to the working poor who face disincentives at rates as high as 60 percent to 100 percent earnings. The question of labor market imperfections, which currently seems to be out of favor as a research topic, may be an extremely important aspect of our current economic situation as I will note later.

The sixth question on the distribution of employment is important because it asks whether the CPS can be an information source which would directly remove some barriers to the efficient use of our nation's human resources. The answer to this question also has important implications for the optimum distribution of federal resources by type of expenditure and by region. The importance of the final question, which relates to the social and personal hardships faced by Americans under current labor market conditions, is, I hope, obvious to all.

The CPS and the Macroeconomic Policy Issues

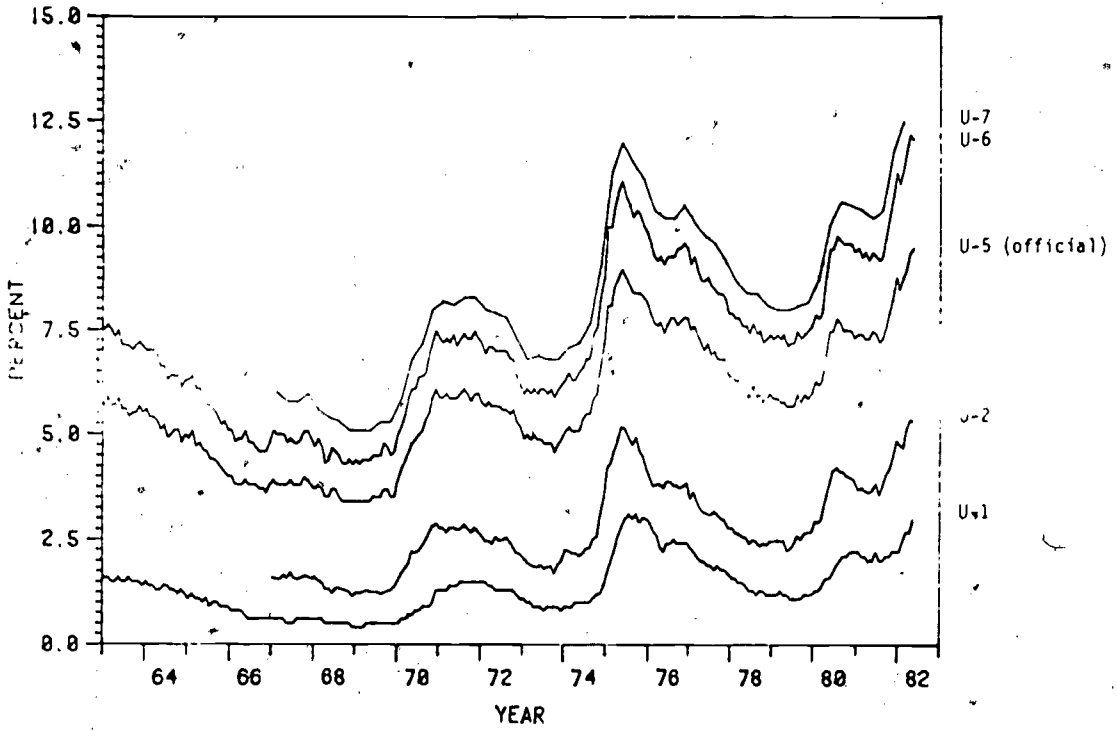
The value of the CPS in answering many of these critical policy issues should not be underestimated. While we can argue about the exact definition of many of the terms in the survey and the alleged biases in both directions, the CPS usually provides unambiguous answers to the two key "macroeconomic" policy questions. Furthermore, any limitations of the "official" key unemployment rate

measure are offset by the availability of supplementary data and the exhaustive analysis of these data which has already been accomplished.

Any uncertainty surrounding the current state of the labor market, as it relates to the macroeconomic issues, does not stem from confusion on the definition of the phrase "hidden unemployment," the phrase "looking for work," or the labor market attachment of teenagers; rather, uncertainty can only occur if people do not understand, or prefer to obfuscate, phrases such as "9.5 percent" (the current unemployment rate), "10.5 million" (the current number of unemployed Americans), "5.9 million," (the number of people who lost their last job) or "50 percent" (the black teenage unemployment rate). Certainly we are utilizing our labor force extremely ineffectively, and labor market "tightness" is providing little, if any, inflationary pressures on wage rates.

Some confusion relating to the macroeconomic issues may arise when the unemployment rate is between 4 percent and 6 percent. However, even in these ranges sufficient supplementary data are provided to obtain good estimates of the macroeconomic impacts of labor force conditions. Furthermore, criticisms of the CPS unemployment rate data usually relate primarily to the definitions employed. Even if the various proposed changes were adopted, the adjustments would primarily affect the reported level rather than reported changes in the unemployment rate. As is shown in Figure 1, fluctuations in the unemployment rate are quite similar, no matter which unemployment rate definition is used. The macroeconomic implications, therefore, would not be severely affected by shifting the definitions of the "official" rate. By contrast, the problem in defining policy usually relates to weighing the relative importance of the two partially contradictory macroeconomic policy issues, a question which data collection cannot hope to resolve.

Figure 1. Alternative Unemployment Rate Measures



SOURCE: U.S. Department of Labor.

Returning to the present situation for a moment, I would like to pose the question: "If the answers to the macroeconomic policy questions are perfectly obvious, why don't we do something about the current unemployment situation?" Four possible answers spring to mind immediately. First, we do not possess either the necessary policy tools or the knowledge of how to use them. Second, we may value even small reductions in inflation more than income gains. Third, the CPS data may not present the answers to these questions clearly enough for noneconomists to understand. Fourth, we may believe the present situation represents a temporary but necessary adjustment, which will allow us to eventually reach a period of relative price stability and high employment levels.

Since we cannot delve into the minds of policymakers, none of these possibilities can be dismissed out-of-hand. However, the evidence that we can control the economy through monetary and fiscal policies is overwhelming. Therefore the first answer is not likely to provide the most important explanation.

The second answer is even less likely to be the primary driver behind current policy actions. It is well known that as unemployment rises, the costs rise in at least a linear fashion, while the inflation reducing impact rises at an ever diminishing rate. Public opinion polls indicating that most Americans are not even aware of the extent of recent inflation reductions, when combined with this asymmetry of costs and benefits, must mean that 9.5 percent unemployment is not the rate preferred by most Americans.

One can argue that economists have been poor in communicating information on these policy options or the costs of unemployment to policymakers. That view leads directly to the third point. Perhaps current data, including the CPS data, do not adequately address the macroeconomic policy

issues and relationships. Certainly, by combining compensation data (perhaps from the March CPS) with the monthly regional and skill unemployment and underemployment data, one could calculate an "income gap" measure. This measure would address the "income lost" question more directly. The loss in income could then be compared with either a zero baseline or perhaps more appropriately some arbitrary unemployment rate, or perhaps to a time when labor market conditions for a given percentage of the economy were defined as "tight." (While the latter measure is of course subjective, the same criticism could be leveled as with other commonly used indices, such as capacity utilization or the timing of NBER reference cycles.)

The same goal—emphasizing the "income gap" consequences of high unemployment could also be addressed by changing the definition of the "official measure" of unemployment. Unfortunately, this would reduce the usefulness of the data for estimating labor market induced inflationary pressures. However, there are several reasons for suggesting that the official measure of the unemployment rate should concentrate on the "income gap" question rather than the inflation question. First, most empirical studies of the U.S. economy, including econometric models, Phillips-curve analysis, and anecdotal reports, have found that the relationship between unemployment and inflationary pressures are variable. Thus we may be giving up a useful direct indicator of income lost for a less useful indirect measure of inflationary pressures. Second, for unemployment rates above 5 percent, which means for 10 of the last 11 years, the changes in national income from changes in the unemployment rate are almost certainly more important than the changes in the job market pressures on wage rates from changes in the unemployment rate.

Third, recent evidence by Medoff and Abraham (NBER Working Paper 781) suggests that labor market indicators

which measure unsatisfied demand are better for measuring the inflationary pressures in the economy than the unemployment rate. If these indices, which include the quit rate from the CPS, do in fact perform this function equally well or better than the published unemployment rate, it is clear we should use the unemployment rate to measure the loss in income and output, and these other measures to estimate labor market inflationary pressures.

Thus a change in the focus of the official unemployment rate to a measure which includes workers discouraged for economic reasons and those working part time for economic reasons would seem to be warranted. The collection of job vacancy data, as a supplement to the CPS would aid in assessing of labor market inflationary pressures, and would more than compensate for the change in focus of the official unemployment rate.

On a more mundane level, I should note that one recurring problem with the CPS data is the lack of reliability of the monthly unemployment estimates. Macroeconomists often find themselves "explaining away" the unemployment data for a given month because of sampling and seasonality problems. It may be that some policymakers, after hearing that "this month's data are poor" too many times, begin to believe the data set itself is useless. A larger sample would help to remedy these problems. An even more important, and less costly, improvement would be to stagger the CPS surveys during the month. This would reduce the number of distortions which arise as a result of extremely poor weather in a given week during the winter, the variability of school recesses in the spring, and the randomness of holidays throughout the year. In essence, the unemployment rate would be a true monthly series instead of a weekly series gathered only 12 times a year.

Why Does the Current Recession Exist?

Returning to the dilemma posed earlier, perhaps current employment rates are tolerated, not because we lack the knowledge to do better, but rather because there is a belief that it is necessary to endure an admittedly painful but presumably temporary adjustment period to arrive at conditions which will be substantially better in the future. This explanation, I believe, should not be denigrated as either implausible or as stemming from "latent Puritanism." First, I have run out of alternative hypotheses. Second, this rationale is often cited by policymakers when describing the current situation. Third, I believe there is some evidence that the current recession is having a significant impact upon American society in a way which augers well for the long-run health of the nation.

The data I am referring to are, for the most part, scattered and anecdotal. It may be that when collected and evaluated they would be found insignificant. However, we have all heard the charge that recessions are "necessary" to remove excessive expectations from the system. It is hardly radical to suggest that this view should be the subject of investigation.

Indeed, it does appear that the current economic environment is substantially reducing expectations of income gains in some sales. For example, until recently, it appeared that a serious and growing imbalance was developing between the compensation rates of workers in some industries, primarily those with industrywide collective bargaining agreements, and those of other workers. Casual empiricism would suggest that the current recession is rectifying some of these imbalances. Furthermore, it may be that a less severe recession, even if coupled with the same import problems, would not have served this end.

The current recession has clearly lowered the expectations of most Americans in terms of expected standard of living increases. If these lowered expectations persist even after the economy begins to recover, it will be much easier for the economy to satisfy these expectations without inflation. Presumably this means less inflation through a "better" (i.e., lower) rate of consumption (assuming the validity of the permanent income hypothesis). It also may mean lower demands for transfer payments and hence lower taxes, and increased incentives for low income workers to stay in the labor force and accept low paying jobs and lower minimum wage gains.

A third example seems evident when one talks to business leaders who appear to be placing renewed emphasis on curbing inventories, cutting overhead staffs, increasing line worker productivity, and improving quality control. Until last year, productivity growth seemed to be a national goal rather than a business imperative. However, the preliminary GNP and employment data indicate that productivity, using the BLS measure, rose last quarter despite a falling GNP. The last time that occurred was in the fourth quarter of 1957. Certainly one quarter's data can always reflect a coincidence. Many more months of data will be needed before a structural trend could clearly be discerned. Nevertheless, it may be that a profit squeeze as disasterous as the squeeze experienced in recent months was necessary, given the structure of our economy, to restore productivity growth to an elevated role in American business decisions.

Perhaps these reorientations of expectations and goals would have occurred without a recession as serious as the one we are experiencing. Perhaps the changed views of the world will fail to persist. Perhaps the change is quantitatively unimportant. However, in the current evidence vacuum it is difficult to counter the charge that recessions are useful in this regard.

The Key Microeconomic Policy Issues

The purpose of presenting this hypothesis, or perhaps more correctly, this series of conjectures, is not to argue that pain can be good for you—even if one does feel better when it stops. Rather it is to suggest that some of the major economic problems in the United States may be microeconomic rather than macroeconomic in nature. (This may seem like an unusual position for a macroeconomist to take. However, I remind you that it is common for members of the Fed to discuss fiscal policy—leaving the monetary policy discussions for the Congress.)

In a situation in which competitive markets exist, one should not need severe recessions to change expectations and restore primacy to questions of marginal cost and marginal productivity. For example, in a competitive environment, it would not be necessary to destroy or seriously weaken every company in an industry, or every worker in an industry, in order to convince them to act efficiently. The market should "discipline" companies and individuals who fail to follow these precepts one at a time.

This line of thought suggests that the key to solving our current economic problems and to avoiding severe recessions in the future (other than those stemming from energy "shocks," from crises, or from past policy errors) does not require only that we be better informed on the macroeconomic causes and consequences of policy actions; rather it requires us also to look at some microeconomic data and microeconomic solutions. While the CPS appears to be designed primarily to explore macroeconomic issues, it may be that the CPS data can be helpful in providing information on the microeconomic issues as well. If so, it will require great ingenuity by researchers in blending the CPS data with full longitudinal and other microeconomic data bases. Furthermore, there may be areas in which it is extremely impor-

tant to add to the current CPS survey, either on an annual or on a more frequent basis.

The types of microeconomic questions which could use more study include: (1) the extent to which industrywide collective bargaining has provided monopoly gains to workers in those industries and consequent losses to others; (2) the extent to which transfer payments affect work disincentives (for example, combining the results of the Seattle-Denver experiment, particularly comparing the differences in the three-year and the five-year program impacts with CPS-based data on the impact of unemployment compensation differences); and (3) the magnitude and types of barriers to employees changing their occupation and/or place of residence. These questions and other microeconomic-oriented questions are important not just because they would improve our understanding of the economy and help devise specific programs which would benefit many potential workers. The answers to these questions might also lead to direct program actions which would not only immediately improve the performance of the economy on a macroeconomic basis, but might also obviate the rationale for putting the economy through recessionary conditions as severe as those we are presently experiencing.

I recognize the limitations of the CPS as a microeconomic data source. Examples are: (1) followup after 16 months is nonexistent; (2) the following of workers to other locations is not attempted; (3) the sample size is too small for many cross-sectional applications. This argues for supplementing the data where possible from other studies, providing results which are admittedly preliminary and tentative, and for trying to convince the government to improve the data base.

The CPS and Occupation/Skill and Regional Data

In the area of data collection, the recession and government policies have certainly caused economists to experience the phenomenon of "lowered expectations." However the cost of data collection is hardly a legitimate objection when economic policies are based upon the data. If microeconomic policies could be used to accomplish goals presently accomplished with macroeconomic policy, the net average increase in GNP and federal revenues would be in the billions. Collecting data is clearly cheaper than executing policies in ignorance.

Without belaboring the point, it is clear that additional data on occupation and skill classifications, on regional employment conditions and on demographic detail would be useful to policymakers. The need for a consistent comparable job vacancy index was noted earlier. Its usefulness on a regional level would be even greater than on a national level. When critical policy decisions—on the state, local and federal levels—are based upon poor information, or when billions of dollars in federal funds are distributed suboptimally because proper data do not exist, or when executive offices spend millions to "create" labor force estimates because the primary data are unreliable or nonexistent, no one gains. Information is a public good. If we underproduce it, we all suffer.

The Social/Personal Costs of Labor Conditions

As I noted in the beginning, the ordering of the policy questions was designed for expositional ease rather than to denote importance. Indeed, the last issue, the social/personal costs of unemployment, is perhaps the most important of all. I have saved it for last because I believe the CPS can

be utilized as a source of information on this issue only if a major amount of specific supplementary data are gathered.

Certainly the CPS provides a crude but useful measure of the costs of unemployment. If the official measure of the unemployment rates is modified as I suggested earlier to reflect the "income gap" aspect of unemployment, the social/personal costs of unemployment would be shown even more dramatically. However, this measurement of these costs is far from precise. Unemployment compensation reduces the costs of short-run unemployment; but how can this be quantified? A simple measure like the unemployment rate will not even capture the direction of change in social/personal costs which result when benefits are increased. Clearly unemployment in a one-worker family is more serious than the unemployment of one worker in a multi-worker family; but how much? Clearly, full-time employment in an occupation which uses a worker's abilities only partially is a cost; but how is the concept to be defined?

These costs are both cyclical and secular. Secular costs are even more difficult to define than cyclical costs. "Poverty" in the United States is defined using income levels which would denote affluence in other nations. Indeed, to the extent that "poverty" is relative, winning the war on "poverty" can be accomplished only by equalizing all incomes. Indeed, the definition of secular social/personal costs is, I believe, impossible.

If we accept the concept of costs in a cyclical rather than a secular framework, it may be possible to quantify the social/personal costs of a given level of economic performance. My suggestion for accomplishing this goal is to measure changes in consumption patterns rather than changes in income patterns. One could, using surveys, measure the changes in the consumption behavior of individuals. Shifts in consumption patterns away from "lux-

uries" toward "necessities" would represent personal distress. The changes associated with unemployment would therefore be included in this measure. In addition, other causes of hardship would also be included. A forced wage cut, the absence of overtime or of full-time employment, underemployment, or an oil price "shock" may all lead to personal costs which would be reflected in a consumption based index.

This approach would have several additional advantages. It solves the problem of newly unemployed workers facing different levels of distress as a result of different asset holdings. It also solves the problem of adjusting the distress of unemployment for the existence of income replacement programs in any particular year. Finally it also enables one to deal with people's ability to change their style of social organization in response to unemployment changes. (If a teenager loses his/her job, he/she may be forced to move back with his/her parents. The teenager may be distressed, but the consumption pattern may indicate a minimal social cost.)

The concept, as I have presented it, is obviously extremely rough. Not only have I made no effort to refine it, but the efforts would have been unsuccessful even if I had. Years of gathering primary data, trying to construct an index, and finally observing the index would be required to develop a good measure of personal social distress. However, I do believe that such an indicator is presently lacking and its addition to our list of economic indicators would substantially add to our understanding of the economy, thereby leading to better policy decisions. Without the addition of consumption-oriented data, it may not be possible to create a satisfactory index of the personal costs of unemployment.

Unfortunately, the costs of gathering these data and performing the theoretical and empirical work necessary to con-

struct an index are not small. The decision on whether or not to proceed will not be easy. However, it seems to make little sense to debate social program changes involving billions of dollars in a vacuum because the data necessary to evaluate the social/personal impacts have simply not been collected.

Conclusions

Four types of key policy questions which relate to the CPS have been identified. With respect to the first type—the macroeconomic questions—several suggestions have been presented. First, the focus of the official measure of unemployment should be shifted from industry labor market tightness to quantifying the loss in national income due to unemployment. This could be accomplished either by constructing a direct income gap measure, or by including workers who are either discouraged or working part time for economic reasons in the official unemployment measure. A job vacancy index, or existing CPS data such as the "quit rate" should be used to measure the inflationary pressures resulting from labor market conditions. Second, the amount of monthly randomness of the data should be improved by staggering the survey weeks to create a true monthly (rather than recurring weekly) unemployment index. Expanding the sample would also help in this regard.

The second type of question—the microeconomic/programmatic questions—is often viewed as relating to narrow issues. This view may well be incorrect. Indeed, our failure to deal successfully with the microeconomic inefficiencies in our economy may be a major factor leading to our present sub-par macroeconomic performance. Although the CPS is not well-equipped to deal with these issues by itself, it can make a major contribution to our understanding of these issues if combined with longitudinal, experimental, and other supplemental data.

With respect to the sub-national data questions, both the usefulness and the deficiencies of the CPS are well-known. Extra data gathering efforts in this area would, I believe, be extremely cost efficient in terms of improving our economic performance, improving the effectiveness of federal, state and local policy decisions, and better targeting federal spending programs. In addition to expanding the sample, a separate effort to collect job vacancy indices as a supplement to the CPS data would be helpful.

The final type of question—the personal/social costs of labor conditions—is extremely difficult to answer. In order to address these questions properly, I believe it may be necessary to restrict the question to cyclic rather than long term costs. Even so, it is probably necessary to supplement the CPS data with consumption-oriented survey data and a new index based upon changes in family consumption patterns. Thus the costs of collecting the data and constructing the index will be high. However, the value of the additional information is also likely to be great.

4
The Hardship Consequences of Labor Market Problems*

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Who Really Suffers?

How many really suffer as a result of labor market problems? This is one of the most critical yet contentious social policy questions. In many ways, our social statistics exaggerate the degree of hardship. Unemployment does not have the same dire consequences today as it did in the 1930s when most of the unemployed were primary breadwinners, when income and earnings were usually much closer to the margin of subsistence, and when there was no safety net for those failing in the labor market. Increasing affluence, the rise of multiple-earner families, the growing predominance of secondary earners among the unemployed, and improved social welfare protections, have unquestionably mitigated the welfare consequences of joblessness. Earnings and income data also overstate the dimensions of hardship. Among the millions with hourly earnings at or below the minimum wage level, the overwhelming majority are from multiple-earner, relatively affluent families. Most of those counted by the poverty statistics are elderly, handicapped or have family responsibilities which keep them out of the labor force, so the poverty statistics are by no means an accurate indicator

*This paper was adapted from *Hardship* (Kalamazoo, MI: The W. E. Upjohn Institute for Employment Research, 1982).

of labor market failure. Moreover, in-kind benefits which reduce cash needs are not considered in the poverty measures.

Yet there are also many ways our social statistics underestimate the degree of labor market-related hardship. The unemployment counts exclude the millions of fully employed workers whose wages are so low that their families remain in poverty. Low wages and repeated or prolonged unemployment frequently interact to undermine the capacity for self-support; since the number experiencing joblessness at some point during the year is several times the average annual unemployed, the number who suffer as a consequence of forced idleness can equal or exceed the monthly unemployment levels even though only a minority of those unemployed in any month really suffer. For every person counted in the monthly unemployment tallies, there is another working part time because of the inability to find full time work, or else outside the labor force but wanting a job. Finally, income transfers in our country have always focused on the elderly, disabled and dependent, neglecting the needs of the working poor, so that the dramatic expansion of cash and in-kind transfers has not necessarily alleviated labor market-related hardship.

Mountains of facts, figures and learned treatises have been marshalled to prove that the truly needy are few and far between. An equally imposing volume of contradicting evidence documents uncounted and unmet basic needs. The result is confusion. It is uncertain and bitterly disputed whether those suffering seriously as a result of labor market problems number in the hundreds of thousands or the tens of millions, and, hence, whether high levels of joblessness can be easily tolerated or must be countered by job creation and economic stimulus, whether the safety net needs dismantling or strengthening, and whether the long term hardship trends

justify a "laissez faire" response or demand fundamental restructuring of labor markets and the income distribution system. There is only one area of agreement in this debate—that the existing poverty, employment and earnings statistics are inadequate for one of their primary applications: measuring the welfare consequences of labor market problems.

Thus, the hardship measurement system was developed to determine who really suffers as a result of joblessness, low earnings and involuntary part-time employment. Available employment, earnings and poverty data are structured into a set of core indicators which incorporate alternative need and workforce attachment standards, which assess the severity of problems as well as the numbers affected, which consider earnings from both an individual and family perspective, as well as considering supplementary income including in-kind aid. The aggregate measures, in turn, are disaggregated to identify the relative hardship burdens for different population segments and to learn more about the causes and cures for hardship.

The Dimensions of Hardship

The Basic Indicators

The hardship measures are designed to address six basic questions:

— *Inadequate Individual Earnings (IIE)* - How many persons who participate in the workforce during the year are unable to earn at least the minimum wage equivalent for their total hours of work availability?

— *IIE Deficit* - What additional earnings are needed to raise the wages and salaries of these individuals with inadequate earnings to the minimum wage level?

— *Inadequate Family Earnings (IFE)* - How many workforce participants are in families whose total wages and salaries are below the poverty level?

— *IFE Deficit* - For workforce participants with Inadequate Family Earnings, what is the shortfall between family earnings and poverty thresholds?

— *Inadequate Family Income (IFI)* - How many workforce participants have family incomes below the poverty level?

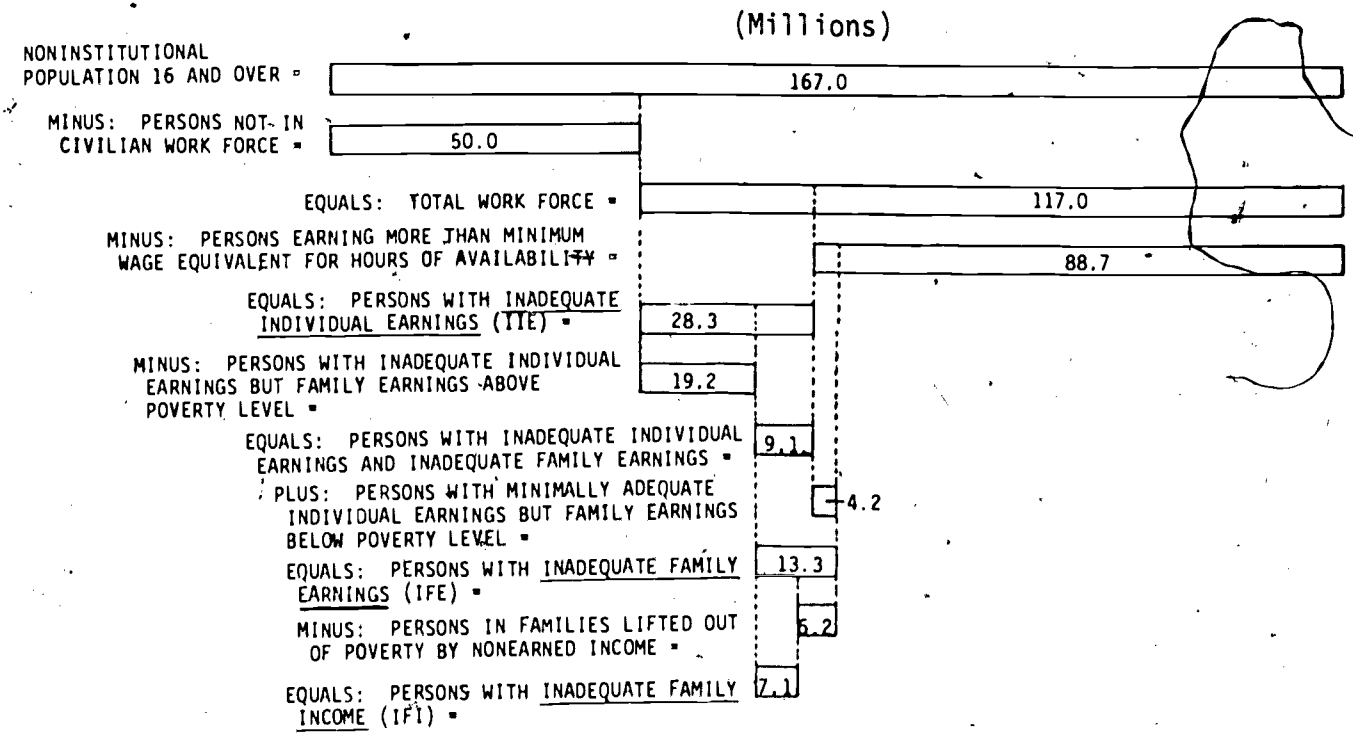
— *IFI Deficit* - How many dollars of added earnings or other income are needed to raise the families of workforce participants in the IFI out of poverty?

Based on the work experience, income, earnings and other information collected in the March Current Population Survey covering the preceding calendar year, these questions can be answered for each year since 1974, with the latest available data covering 1980. The derivation and dimensions of hardship are best illustrated using 1979 as a baseline, since this was the last year when the economy was reasonably healthy:

1. *Inadequate Individual Earnings (IIE).* During 1979, seven of every ten persons age 16 and over worked or looked for work in the civilian labor market. Among these 117.0 million participants, one of every four, or 28.3 million, had annual earnings less than the amount each would have earned if paid the minimum wage for all hours they were willing and able to work during the year (Chart 1).

2. *IIE Deficit.* To raise the earnings of these individuals up to the minimum wage equivalent for their hours of availability would have required $52.0 billion in additional earnings, which represented 4.0 percent of the nation's total wages and salaries. The average worker

Chart 1
Persons in Severe Hardship, 1979



in the IIE needed $1,839 in added annual earnings to reach the minimum wage equivalent.

3. *Inadequate Family Earnings (IFE).* Not all these individuals were economically deprived as a result of their earnings shortfalls, while others, who themselves earned at least the minimum wage equivalent, nevertheless lacked the annual family earnings required to escape poverty either because of their own limited hours of availability for work, their large families, or the lack of supplementary family earners. Two-thirds of the 28.3 million persons with Inadequate Individual Earnings lived in families with combined earnings *above* the poverty level, leaving only 9.1 million in families unable to achieve minimal self-support by the work of family members. On the other hand, there were 4.2 million workforce participants with *adequate* individual earnings relative to their hours of availability who were in families with below-poverty earnings. These 13.3 million workforce participants with Inadequate Family Earnings represented 11.4 percent of the total workforce.

4. *IFE Deficit.* Workforce participants with Inadequate Family Earnings needed an additional $31.7 billion in wages and salaries to raise their families' earnings to the poverty level. This IFE Deficit represented 2.4 percent of the nation's total wages and salaries and averaged $2,384 for each workforce member in the IFE count.

5. *Inadequate Family Income (IFI).* Of the 13.3 million in the IFE, 2.8 million were in families lifted out of poverty by the receipt of private pensions, alimony, interest and other nontransfer income. Cash transfers such as welfare and social security, raised an additional 3.4 million above the poverty threshold. Thus, just

over half of the individuals with Inadequate Family Earnings also had Inadequate Family Income. This 7.1 million in the IFI represented 6.0 percent of the workforce and two-fifths of the poor age 16 and over.

6. *IFI Deficit.* Transfers and other sources of income reduced the $31.7 billion IFE Deficit by almost three-fifths. The $12.8 billion IFI Deficit for poor families with members in the workforce represented over half of the nation's total poverty deficit. To alleviate poverty among the working poor would have required an additional $1,818 in earnings supplements for each workforce participant with Inadequate Family Income.

Hardship and Workforce Attachment

These measures of severe hardship counted all individuals participating in the workforce during 1979, including some holding or looking for part-time jobs so that they were available for work just a few hours over the year, but others in the labor force full-time, year-round. Although seven of every ten workforce participants in 1979 worked or looked for work at least 50 weeks, only half of those with Inadequate Individual Earnings were available full-year (Chart 2). Among the workforce participants in the IFE and IFI, only three-fifths participated for half a year or more and just two-fifths were full-year participants.

Increased workforce attachment reduced the probability of economic hardship (Chart 3). The rates of Inadequate Family Earnings and Inadequate Family Income among participants in the workforce less than half the year were more than four times the rates among full-year participants. Obviously, families with full-year participants had more hours of potential employment and were, therefore, more likely to have family earnings above the poverty level. Yet the in-

Chart 2
Severe Hardship Counts by Work Force Attachment During 1979

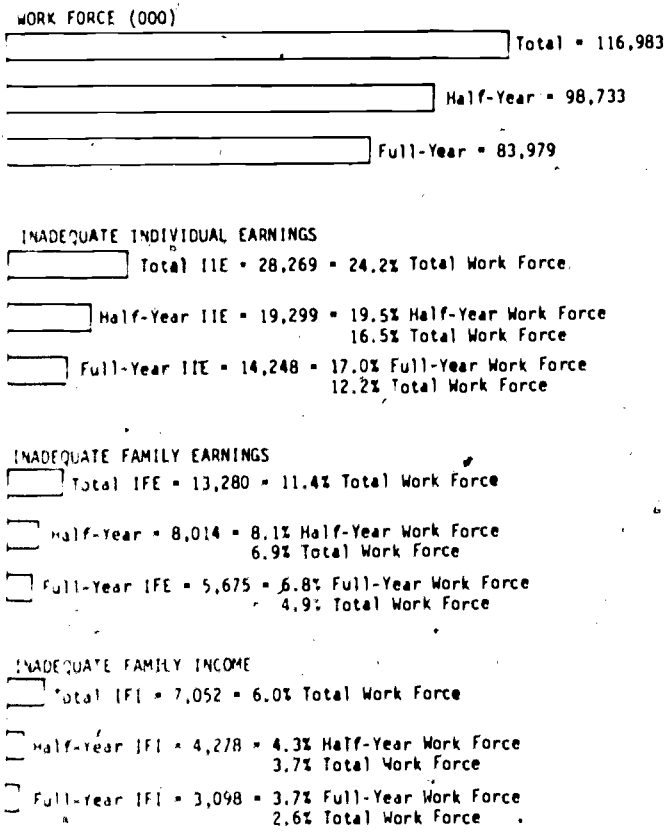
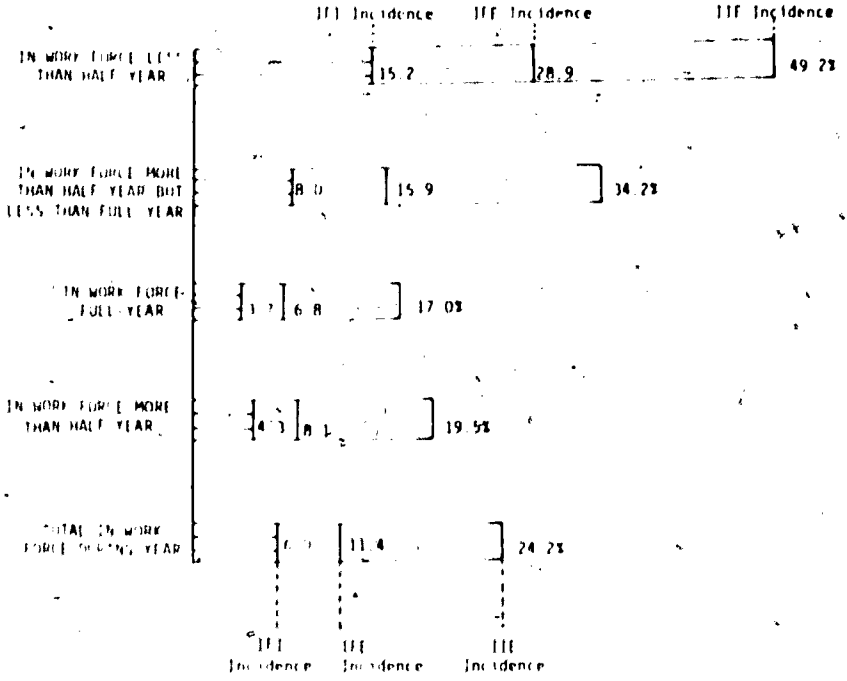


Chart 3
Incidence of Hardship by Work Force Attachment, 1979



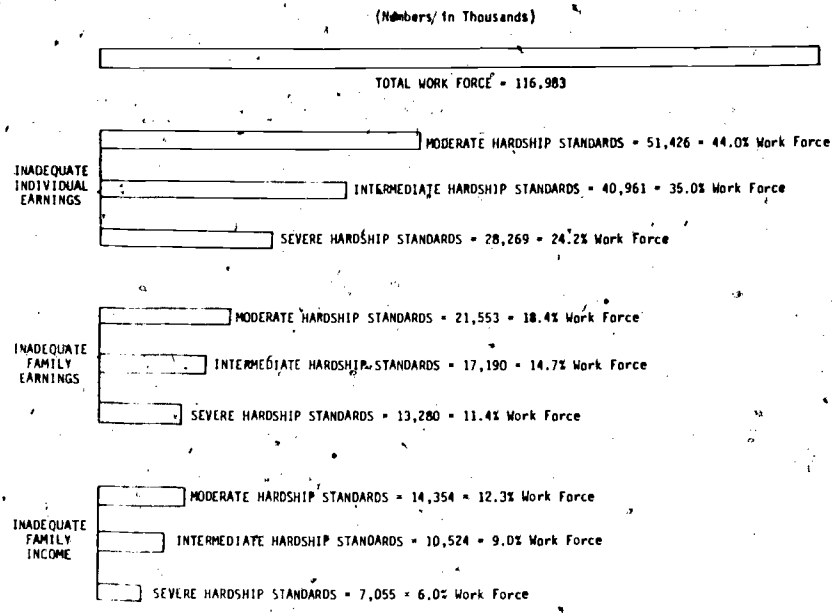
cidence of Inadequate Individual Earnings among less than half-year participants was also greater than among full-year participants, even though the adequacy of each person's yearly earnings was judged relative to his or her estimated annual hours in the workforce.

Alternative Adequacy Standards

The attainment of minimum wage earnings for individuals and poverty threshold earnings for families is hardly a cause for rejoicing. For an urban family of four, the lowest-level food menu of the Department of Agriculture, dinner out at a low-priced restaurant once every two months, minimally adequate rental housing, no out-of-town trips, auto ownership by just half of families, a movie for the children once a month, no cigarettes, and a six pack of beer three times a month for the family, would have cost an estimated $12,000 in Autumn 1979. The 1979 poverty level for a nonfarm family of four represented less than three-fifths of this BLS lower living standard. If one parent worked full time and the other worked part time at the $2.90 minimum wage in 1979, their combined family earnings would have been less than three-fourths of the standard; and even if both earned 150 percent of the minimum wage; they would have just achieved the lower living standard.

The use of less severe earnings and income standards increases the hardship counts and related deficits (Chart 4). Calculating the IIE on the basis of 125 percent, rather than 100 percent, of the minimum wage for all hours of availability, raises the IIE tally among total workforce participants by 45 percent; while comparing family earnings and incomes to 125 percent rather than 100 percent of the poverty level raises the IFE count by 30 percent and the IFI count by nearly half.

Chart 4
Hardship Among 1979 Work Force Participants Under Alternative Adequacy Standards



Severe Hardship Standard: IIE earnings standard 100 percent of minimum wage and IFE family earnings and IFI family income standard 100 percent of poverty

Intermediate Hardship Standard: IIE earnings standard 125 percent of minimum wage and IFE family earnings and IFI family income standard 125 percent of poverty

Moderate Hardship Standard: IIE earnings standard 150 percent of minimum wage and IFE family earnings and IFI family income standard 150 percent of poverty

What Causes Hardship

Labor Market Pathologies

The unemployment rate is our nation's most carefully scrutinized and widely quoted social indicator, to a large extent because of the presumed association between joblessness and economic deprivation. Each week of forced idleness reduces annual earnings and increases the chances that individual and family earnings will be inadequate. Almost all of the 1979 workforce participants who were unemployed or discouraged for two-thirds or more of their weeks in the labor market had annual earnings below the minimum wage level for their yearly hours of availability (Chart 5). Yet among those unemployed less than a third of their weeks in the labor force, two of every three had at least minimally adequate individual earnings over the year. Since this group with shorter duration unemployment represented three-fifths of those experiencing unemployment, only half of all the unemployed had Inadequate Individual Earnings, among whom three of every five resided in families with combined earnings above the poverty level. Just one of every seven workforce participants who experienced unemployment during the year resided in a poor family.

Workforce participants who experienced unemployment (000)	18,468
- Unemployed with adequate individual earnings	-8,591
= Unemployed in IIE	9,877
- Unemployed with Inadequate Individual Earnings but family earnings above poverty level	-6,169
+ Unemployed with adequate individual earnings but Inadequate Family Earnings	+ 502
= Unemployed in IFE	4,210

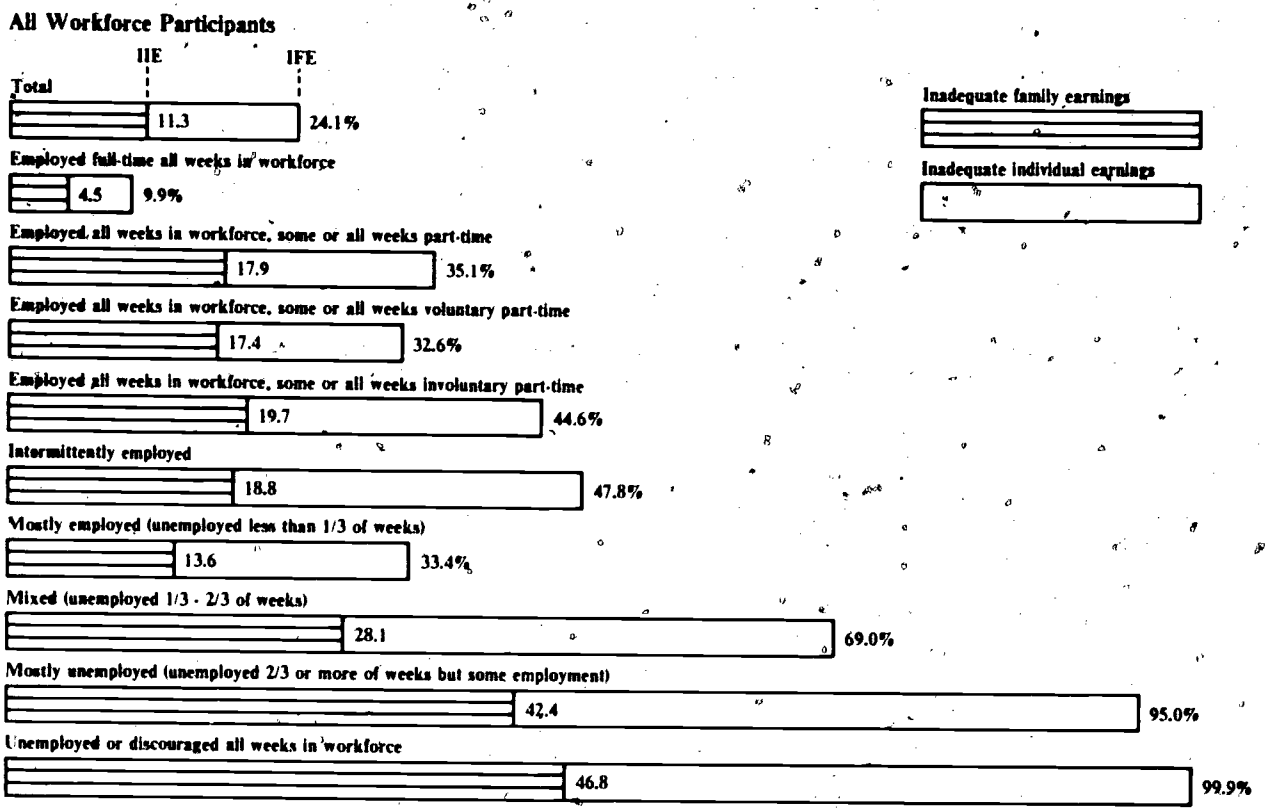
- Unemployed in IFE lifted out of poverty by non-transfer income	-548
- Unemployed in IFE lifted out of poverty by cash transfers	-1,044
= Unemployed in IFI	2,618

Thus, unemployment and economic hardship were hardly synonymous. Over half of those who experienced unemployment during 1979 resided in families with incomes above $15,000, or just below the median family income level, compared with only 6 percent of labor force participants included in the IFE count, and virtually *none* of those included in the IFI count (Chart 6).

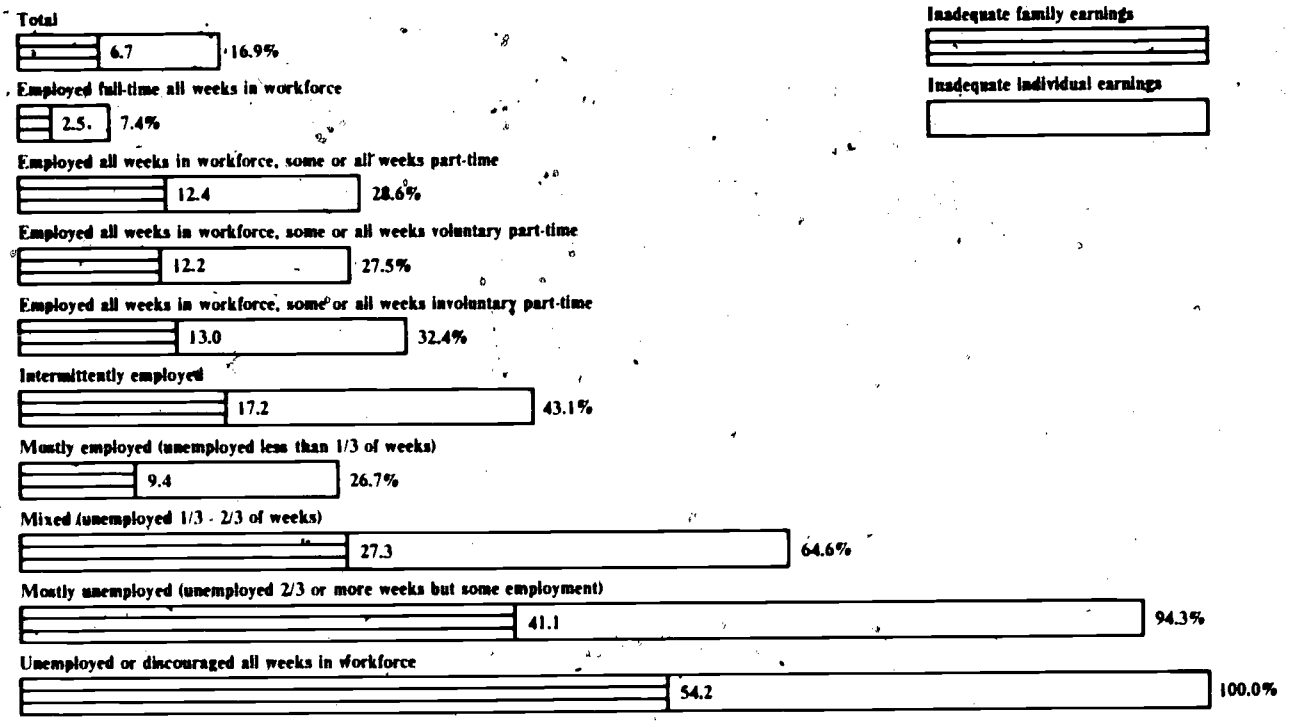
Low hourly earnings and limited hours of employment, rather than unemployment, were the major causes of hardship. Two-thirds of the 28.3 million workforce participants with Inadequate Individual Earnings, and a similar proportion of the 13.3 million with Inadequate Family Earnings, experienced *no* unemployment during the year. There were 6.4 million low-paid workers who were employed full time during all weeks of participation yet did not earn the minimum wage equivalent for their hours of availability. Likewise, one of three persons with Inadequate Family Earnings, and a fourth of these with Inadequate Family Income, had full-time jobs during all their weeks in the workforce. Thirty-five percent of part-time workers who were employed all weeks of participation did not earn the minimum wage equivalent for their hours of availability, and they accounted for over two-fifths of the persons with less than minimum wage earnings.

	Distribution of workforce and severe hardship counts for total workforce by work experience pattern			
	Work force	IIE	IFE	IFI
Employed full time all weeks	55.0%	22.7%	22.0%	24.8%
Employed part time voluntarily some or all weeks, no unemployment	23.1	31.1	35.6	26.6
Employed part time involuntarily, some or all weeks	6.1	11.3	10.7	11.6
Unemployed one-third or fewer weeks in workforce	9.4	13.0	11.3	13.3
Unemployed one-third to two-thirds weeks in workforce	3.3	9.5	8.3	8.9
Unemployed over two-thirds of weeks in workforce but with some employment	1.4	5.4	5.1	6.0
Not employed	1.7	7.0	7.0	8.9
Total	100.0	100.0	100.0	100.0

Chart 5
Severe Hardship Incidence Rates Among Individuals with Differing Patterns of Work Experience During 1979



Full-Year Workforce Participants



Breadwinners and Breadwinning Responsibilities

Because needs increase with family size, the welfare consequences of low individual earnings are more serious for breadwinners who must support large families. Where there are many mouths to feed, minimum wage equivalent earnings are not a passport out of poverty even with full time, full-year employment. But many breadwinners with numerous dependents also have limited annual hours of work availability and of actual employment.

Among the 13.3 million workforce participants with below-poverty family earnings in 1979, and the 5.7 million in the full-year IFE, 4.2 million and 1.2 million, respectively, earned above the minimum wage equivalent for their annual hours of availability. Conversely, among the 28.7 million total workforce participants, and 14.2 million full-year participants, with Inadequate Individual Earnings in 1979, only 9.1 and 4.5 million, respectively, were in families with below-poverty earnings.

The probabilities that persons with Inadequate Individual Earnings will be members of families with below-poverty earnings, or that family earnings will be inadequate despite adequate individual earnings, increase with the number of dependents per worker. For instance, the IFE incidence among workers in families with two workforce participants were as follows:

	Incidence of Inadequate Family Earnings among workers with Inadequate Individual Earnings	Incidence of Inadequate Family Earnings among workers with Adequate Individual Earnings
Two in family	18.9%	1.4%
Three in family	17.9	1.2
Four or five in family	26.7	2.3
Six or more in family	46.9	9.3

The likelihood of Inadequate Family Earnings declines when there are more breadwinners in a family and when they have greater labor force attachment. As an example, 1979 workforce participants from families with four or five members had the following IFE rates:

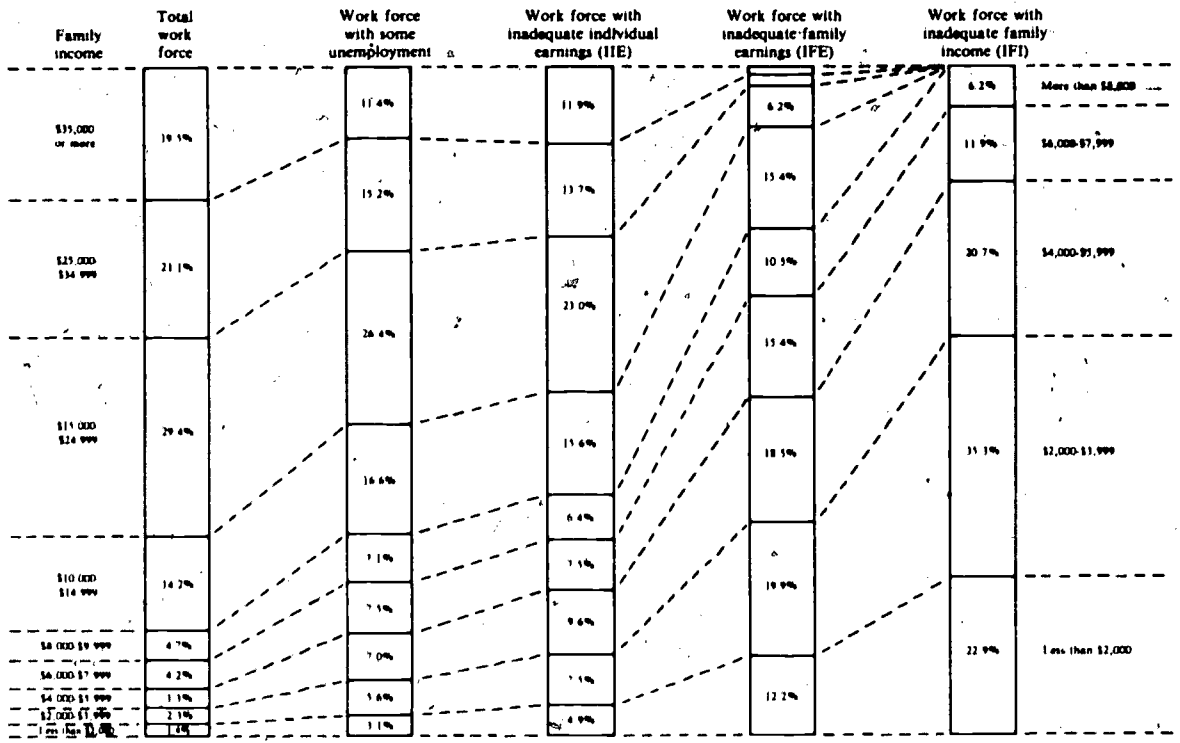
	Incidence of Inadequate Family Earnings among workers in families with four or five members
Three or more full-year participants in family	1.6%
Three or more in workforce at least one week	3.0
Two full-year participants	5.5
Two in workforce at least one week	8.6
One full-year participant	12.3
One in workforce at least one week	20.5

Work and Welfare Overlap

Income transfers mitigate the welfare consequences of labor market problems, but many workers and their families, including millions with substantial workforce participation, fall through the safety net. In-kind aid provides some relief, but adding the estimated value of in-kind food and housing aid only modestly reduces the number of workforce participants in poverty.

Of the 13.3 million workers in families with earnings below the poverty level in 1979, 2.8 million were lifted above the poverty line by nontransfer earnings supplements such as private pensions, alimony, dividends and interest. Cash transfers then lifted a third of the remaining 10.5 million out of poverty. Adding the value of food stamps to the cash incomes of recipient families reduced the working poor by

Chart 6
Distribution of Total Work Force, Unemployed and Work Force Members in Hardship by Family Income



another 0.5 million, while adding the value of free school lunches and housing subsidies reduced the total an additional 0.3 million. In other words, poverty among workforce participants was reduced a third by cash transfers, while cash and in-kind transfers (excluding health care) reduced the number of working poor by two-fifths. Cash assistance reduced the IFI Deficit by $11.2 billion, or almost half, and if food stamps, school lunches and housing benefits received by the working poor were "cashed out," their poverty deficit would have been cut by an additional $2.4 billion.

Hardship Counts

	(000)
Workforce participants in families with below poverty earnings (IFE)	13,280
-Lifted out of poverty by non-transfer earnings supplements	-2,823
Workforce participants who would be poor without transfers (IFI Net-of Transfers)	10,457
-Lifted out of poverty by cash transfers	-3,402
= Work force participants in poverty (IFI)	7,055
-Lifted out of poverty by addition of value of food stamps to cash income	-533
-Lifted out of poverty by addition of value of housing subsidies and school lunches to cash income and food stamps	-281
Work force participants in poverty counting in-kind aid as income (IFI Including In-Kind Aid)	6,241

Hardship Deficits

	($000)
Family earnings deficit of workforce participants in families with below poverty earnings (IFE Deficit)	$31,656
-Reduction in family earnings deficit resulting from non-transfer earnings supplements	-7,650
= Poverty deficit of families with workforce participants if cash transfers excluded (IFI Net-of-Transfer Deficit)	24,006
-Reduction in poverty deficit resulting from cash transfers	-11,181
= Poverty deficit of families with workforce participants (IFI Deficit)	12,825
-Reduction in poverty deficit if food stamps counted as cash income	-1,916
-Further reduction in poverty deficit if value of housing subsidies and school lunches added to cash income and food stamps	-530
= Poverty deficit of families with workforce participants when in-kind aid value included with cash income (IFI Including In-Kind Aid Deficit)	10,379

The Burdens of Hardship

Hardship, like unemployment, is most likely to affect women, minorities, younger and older workforce participants, persons with limited education, workers in blue-collar and service jobs, and residents of nommetropolitan areas and large central cities. As a general rule, the burdens of hardship are even more maldistributed than the burdens of unemployment.

Sex

The incidence of unemployment among female workforce participants was only slightly above that for males. In contrast, females were 1.4 times as likely as males to have Inadequate Family Earnings and Inadequate Family Income, while the incidence of Inadequate Individual Earnings was 1.9 times higher among women than among men. Though males were much more often primary breadwinners, the sex differentials in hardship rates were substantial, and far greater than the differentials in unemployment rates, for males and females with similar support responsibilities.

	Average annual unemployment	Experienced some unemployment during year	IIE	IFE	IFI
Males	5.1%	15.5%	17.5%	9.7%	5.2%
Females	6.8	16.1	32.4	13.4	7.1
Males family heads (No wife in workforce)	3.4	9.8	9.7	13.8	6.2
Female family heads	5.2	20.4	29.8	33.4	22.0

Race

Black workforce participants were 1.7 times more likely than whites to experience unemployment during the year, and they were 1.5 times as likely to have Inadequate Individual Earnings. But the black IFE was 2.5 times that of whites, while blacks were 3.4 times as likely to have Inadequate Family Incomes. Similarly, Hispanics were half again as likely as whites to experience unemployment, but the IFI incidence among Hispanics was 2.4 times that among whites.

	Average annual unemployment	Experienced some unemployment during year	IIE	IFE	IFI
Whites	5.1%	14.7%	22.9%	9.8%	4.8%
Blacks	12.2	24.2	34.6	24.1	16.4
Hispanics	8.3	22.0	28.5	16.0	15.5

Age

The incidence of Inadequate Individual Earnings was twice as high among workforce participants age 65 and over as among those age 25 to 44, and the incidence of Inadequate Family Earnings among older workers was 5.4 times that among prime age workers, although income transfers equalized the IFI rates. Teenagers were three and a half times as likely as prime age workers to have Inadequate Individual Earnings.

	Average annual unemployment	Experienced some unemployment during year	IIE	IFE	IFI
16-19	16.1%	26.5%	59.4%	15.2%	9.2%
20-24	9.0	25.5	30.8	12.7	8.0
25-44	4.5	14.9	16.9	8.4	5.7
45-64	3.1	9.1	17.5	9.2	4.2
65 and over	3.4	5.8	35.7	45.1	4.3

Education

The incidence of hardship declined significantly with increased educational attainment. High school dropouts were 2.6 times more likely than college graduates to experience unemployment during the year, but the IIE, IFE and IFI rates for dropouts were, respectively, 3.7, 4.3 and 5.5 times those for college graduates.

Highest educational attainment	Experienced some unemployment during year	IIE	IFE	IFI
Students	20.3%	54.7%	16.2%	8.0%
Dropouts	22.0	34.6	21.5	12.1
High school graduates, no further education	15.9	21.3	8.9	4.7
Post-secondary education (1-3 years)	13.0	16.2	7.6	3.8
College graduates	8.5	9.4	4.9	2.2

Occupation

The incidence of unemployment among operatives, laborers, farm and service workers was 2.8 times the incidence among professional, technical, managerial and administrative workers, but the IIE, IFE and IFI rates were 3.4, 2.9 and 3.5 times as high.

	Average annual unemployment	Experienced some unemployment during year	IIE	IFE	IFI
Professional, technical and managerial	2.3%	7.1%	10.2%	5.6%	2.6%
Sales	3.9	10.8	29.4	10.8	4.4
Clerical	4.6	12.1	21.3	8.5	4.4
Craft and kindred	4.5	17.3	11.5	7.5	4.3
Operatives	7.7	22.0	19.6	10.1	5.6
Laborers	10.8	27.4	35.2	16.6	9.7
Farm workers	3.8	11.0	58.4	25.7	15.7
Service workers	7.1	16.8	44.8	20.2	10.9

Location

Workforce participants residing in nonmetropolitan areas had the same probability of experiencing unemployment as those in metropolitan areas, but their chances of having Inadequate Individual Earnings were two-fifths higher, while the rates of Inadequate Family Earnings and Inadequate Family Income were half again those of metropolitan-area workers. The unemployment incidence in central cities of SMSA's with over one million population was 1.3 times the incidence in surrounding suburbs; the large central city IFE and IFI rates were 1.8 and 2.3 times those of suburban areas.

	Average annual unemployment	Experienced some unemployment during year	Severe hardship incidence		
			IIE	IFE	IFI
Metropolitan areas	5.8%	15.7%	21.4%	10.1%	5.4%
Central cities	7.1	17.6	23.0	13.1	7.7
Suburbs	5.0	14.3	20.1	8.1	4.0
Nonmetropolitan areas	5.7	15.7	29.8	13.9	7.3

Hardship Trends

The 1974-1980 Shifts

The incidence of Inadequate Individual Earnings declined noticeably over the 1974-1980 period; the incidence of Inadequate Family Earnings declined modestly, while the incidence of Inadequate Family Income actually increased.

Comparisons between the low unemployment years, 1974 and 1979, and the high unemployment years, 1975 and 1980, are the best indicators of these multi-year trends. The severe hardship IIE dropped by 1.6 percentage points between 1974 and 1979, and 1.4 percentage points between 1975 and 1980. The IFE rate fell by 0.2 percentage points in the first period and 0.4 percentage points in the second. The IFI rose by 0.5 percentage points between 1975 and 1980.

	1974	1979	1979-1974	1975	1980	1980-1975	1980-1974
Severe Hardship							
IIE	25.8%	24.2%	-1.6%	29.1%	27.7%	-1.4%	+1.9%
IFE	11.6	11.4	-0.2	13.2	12.8	-0.4	+1.2
IFI	6.1	6.0	-0.1	6.9	7.2	+0.3	+1.1
Intermediate Hardship							
IIE	35.3	35.0	-0.3	38.4	37.9	-0.5	+2.6
IFE	14.9	14.7	-0.2	16.8	16.4	-0.4	+1.5
IFI	9.2	9.0	-0.2	10.3	10.4	+0.1	+1.2
Moderate Hardship							
IIE	44.3	44.0	-0.3	46.6	47.3	+0.7	+3.0
IFE	18.5	18.4	-0.1	20.9	20.5	-0.4	+2.0
IFI	12.8	12.3	-0.5	14.3	14.1	-0.3	+1.3

The moderate and intermediate hardship IIE and IFE totals increased relative to the severe hardship totals, while the moderate and intermediate hardship IFI totals declined relative to the severe hardship IFI. For instance, the severe, moderate and intermediate hardship IFE rates all dropped 0.4 percentage points between 1975 and 1980, so that both the intermediate and moderate hardship IFE counts increased in proportion to the severe hardship IFE count. The patterns were reversed in the case of the IFI, where the severe hardship incidence rose 0.3 percentage points between 1975 and 1980; while the intermediate hardship IFI incidence rose by 0.1 percentage points and the moderate hardship IFI incidence declined by 0.3 percentage points, thus reducing the differential between the moderate and intermediate hardship IFI counts and the severe hardship IFI.

The Unraveling Safety Net for the Working Poor

The incidence of Inadequate Family Income did not decline between 1974 and 1979, and actually rose between 1975 and 1980 because of the declining effectiveness of the safety net for the working poor. The impact of nontransfer

earnings supplements increased significantly over the period, but the diminished impact of cash transfers more than offset this favorable development. For instance, nontransfer earning supplements raised 16.2 percent of the IFE out of poverty in 1975 compared to 19.5 percent in 1980, an increase of 3.3 percentage points. Yet transfer and nontransfer earnings supplements combined lifted 47.3 percent of the working poor out of poverty in 1975, but only 44.0 percent in 1980, a decline of 3.3 percentage points. Among workforce participants who would have been poor in the absence of cash transfers, 37.1 percent were raised out of poverty by cash benefits received in 1975, compared to only 30.4 percent in 1980.

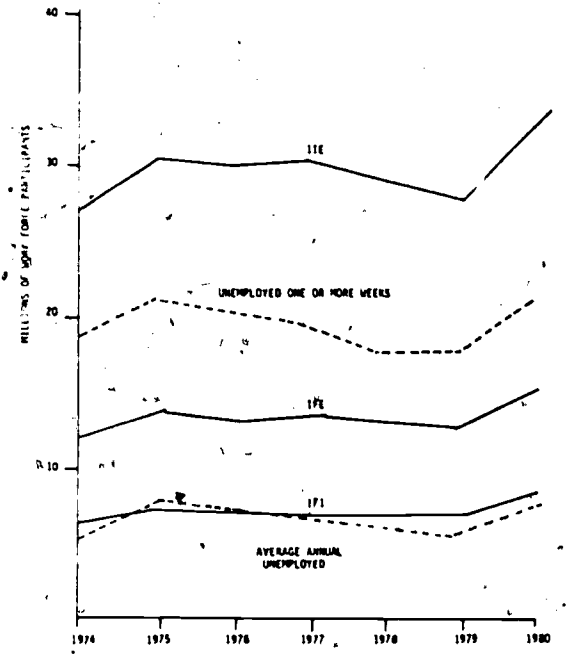
This drop occurred despite a slight decline in the real net-of-transfer IFI average deficit between 1974 and 1979, as well as between 1975 and 1980. It was not explained by changing workforce composition or work experience patterns. For almost all subgroups in the workforce, there was a noticeable drop in the poverty reduction impact of transfers.

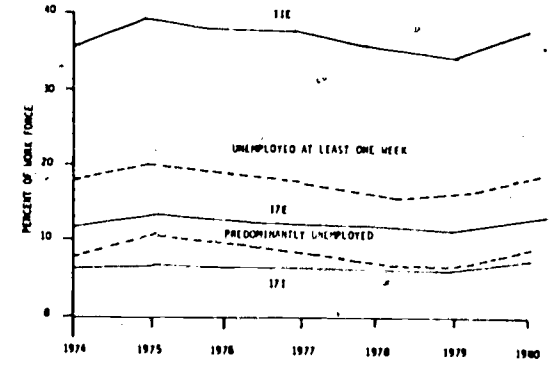
The effectiveness of the safety net diminished as well for the nonworking poor. Yet the slippage was greater among the working poor. For instance, 50.7 percent of all persons in households with no workforce participants in 1975 were lifted out of poverty by cash benefits compared to 49.1 percent in 1980. This 1.6 percentage point drop compared to a 6.7 percentage point drop in the proportion of otherwise poor families with at least one workforce participant who were lifted out of poverty by cash transfers.

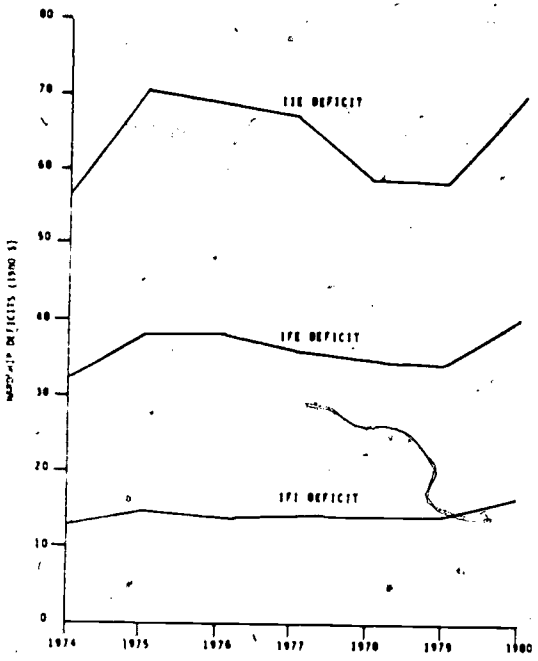
Hardship Over the Business Cycle

Hardship rises in recessions and declines during periods of economic growth (Chart 7). The annual unemployment, IIE and IFE rates were highly correlated over the 1974-1980

Chart 7
Severe Hardship and Unemployment, 1974-1980



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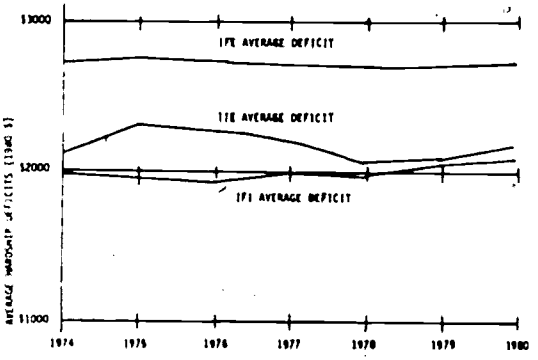
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IFE AVERAGE DEFICIT
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period, although there was a lesser correlation between the unemployment and IFI rates.

	Correlation between average annual unemployment rate and hardship incidence	Correlation between percent workforce experiencing unemployment and hardship incidence
Inadequate Individual Earnings	.92	.91
Inadequate Family Earnings	.94	.87
Inadequate Family Income	.78	.69

However, the proportional fluctuations in hardship were less severe than those in unemployment, since many of the victims of recessions were already in hardship and their situation deteriorated. In the 1974-1975 and 1979-1980 declines, the percentage increases in unemployment were greater than the percentage increases in hardship.

	1974-1975		1979-1980	
	Absolute increase (000)	Percentage increase	Absolute increase (000)	Percentage increase
Average annual unemployment	2,754	54%	1,485	25%
Persons experiencing unemployment	2,568	14	2,942	16
IIE	3,589	13	4,478	16
IFE	1,760	15	1,831	14
IFI	906	14	1,410	20

The standard deviation of the average annual unemployment rate over the 1974-1980 period was 15 percent of the mean; the standard deviation in the IIE, IFE and IFI rates were 7, 7 and 9 percent of their respective means.

The Victims of Recession

Though recessions exacerbate conditions for those who suffer continuing structural employment problems, they also undermine the well-being of the more advantaged segments of the labor force who seldom face hardship under normal circumstances.

—Prime age (25- to 44-year old) workers were underrepresented among those in hardship in 1974, accounting for 29 percent of persons with Inadequate Family Earnings compared to 40 percent of the workforce. Yet 43 percent of the 1974-1975 increment in the IFE were prime age workers.

—Male family heads were also underrepresented among those in hardship, accounting for 40 percent of the 1974 workforce but only 27 percent of the persons in families with below-poverty earnings in 1974. Nevertheless, they accounted for 40 percent of the 1974-1975 increase in the IFE.

—Workers who had completed some post-secondary education accounted for 28 percent of the workforce but only 14 percent of the persons in families with below-poverty earning in 1974. They represented 25 percent of the recessionary increment in the IFE count.

—Whites, who constituted 89 percent of the 1974 workforce but only 76 percent of the IFE, accounted for 92 percent of the 1974-1975 IFE increase.

In the 1979-1980 recession, the same patterns prevailed but were generally less pronounced, as suggested by the ratio of each advantaged subgroup's share of the recession increment of the IFE divided by its share of the pre-recession IFE.

	Share 1974-1975 IFE increment / Share 1974 IFE	Share 1979-1980 IFE increment / Share 1979 IFE
Male family heads	1.47	1.15
Workforce participants who had completed some post-secondary education	1.79	1.27
Whites	1.21	1.04
Prime age workers (25- to 44-year olds)	1.47	1.58

Policy Implications

The Remedies

To significantly alleviate labor market-related economic hardship will require a combination of macroeconomic and targeted structural measures, combined with expanded income transfers for the working poor. Full employment and increased minimum wages are necessary but far from sufficient. Less than a fourth of the 1979 unemployed were in families with inadequate earnings, only one in seven were in poor families, and just a third of individuals with inadequate earnings were in families with below-poverty earnings. Thus, reductions in unemployment or increases in the minimum wage which would reduce the incidence of Inadequate Individual Earnings would also affect many who were not in hardship. Any disemployment effects from increased minimum wages would be concentrated among those at the end of the labor queue. Regressions using 1974-1980 annual data suggest that a 10 percentage point increase in the legislated minimum wage (as measured relative to the real value of the minimum wage averaged for the 1967-1980 period) was associated with a 1.9 percentage point reduction in the IIE rate, a 0.6 percentage point drop in the IFE rate and a 0.3 percentage point drop in the IFI rate. Since the

ratio of the legislated minimum divided by the average real minimum ranged only from 94 percent in 1977 to 102 percent in 1978, or a swing of 8 percentage points, this was not a major factor in hardship trends. A 1 percentage point decline in average annual unemployment was associated with a 1.2 percentage point drop in the IIE, a 0.5 percentage point drop in the IFE and a 0.3 percentage point drop in the IFI.

Projecting 1982 hardship levels based on this simple regression model for 1974 through 1980, and assuming, most plausibly, that unemployment will average 9 percent in 1982 and inflation will erode only 5 percent from the unchanged legislated minimum wage, the IIE rate will be 30.7 percent, the IFE rate, 14.2 percent, and the IFI rate, 8.0 percent (or even higher, as retrenchment in transfer benefits is greater than the 1970s downtrend). These projected levels for 1982 would contrast unfavorably with the 1979 lows of 24.2, 11.4 and 6.0 percent, respectively. Even if unemployment miraculously dropped to a 7.0 percent level for the year, requiring a massive recovery in the summer and fall of 1982, and even if inflation declined to a 2.5 percent annual rate, the IFE would remain at 13.0 percent, almost the same as in 1975—while the IFI would be 7.2 percent, in contrast to 6.9 percent in 1975.

If all workers were provided minimally adequate individual earnings, hardship would not be eliminated and transfers would still be needed to alleviate deprivation among workforce participants and their families. The IFE would have been reduced by only 36 percent in 1979, and the IFE Deficit by 41 percent, if the earnings of all persons were augmented up to the minimum wage equivalent for all hours of availability. If all people living in families with below-poverty earnings in 1979 were provided employment at the usual wage for any hours of forced idleness, and their earnings were then increased by 10 percent, 56 percent would have remained with Inadequate Family Earnings, and they

would have needed $22.1 billion in earnings supplements to reach the poverty level. Thus, targeted manpower programs providing minimum wage employment or marginal earnings improvements would not eliminate the need for income transfers.

Allocation and Targeting

The use of hardship measures to allocate and target resources intended for the unemployed and underemployed from low-income families would yield a substantially different distribution among geographic areas and population segments than the current method of allocating and targeting based on unemployment shares or unemployment and poverty shares. Nonmetropolitan areas would benefit substantially and so would the southern states. The nonmetropolitan area share of the IFE tally, averaged for the 1974-1980 period, was nearly two-fifths higher than the nonmetropolitan area share of average annual unemployment, and a fifth above the nonmetropolitan share of poverty and unemployment, each equally weighted. If funds were allocated based on IFE shares, the suburban rings of metropolitan areas would have received a fourth less than if unemployment shares were the determining factor, or a tenth less than if equally weighted unemployment and poverty shares were used in allocation. The West North Central, South Atlantic, East South Central, West South Central, and Mountain states would have received a fourth more under an IFE-based allocation than an unemployment-based allocation, and a tenth more than under a poverty and unemployment share basis.

If resources were allocated according to need, and need were determined on the basis of the IFE share rather than the unemployment share, family heads (both males and females) would have received greater priority. Also, there would have been much more emphasis on helping older workers and less on youth employment problems. Dropouts would have received far more attention.

	Winners		
	Share of unemployed	Share of poverty and unemployment	IFE share
Male family heads	18.8%	17.7%	24.5%
Female family heads	6.9	11.9	15.2
Unrelated individuals	14.1	24.2	26.4
Dropouts	28.8	42.0	39.9
45 and over	16.5	29.4	36.2

	Losers		
	Share of unemployed	Share of poverty and unemployment	IFE share
Wives	19.7%	17.6%	14.1%
Other family members	40.5	28.7	19.8
High school graduates	38.4	30.7	30.2
Completers of some post-secondary education	22.9	17.1	18.1
16-19	26.6	19.7	13.4
20-24	23.1	18.5	17.1

Adding A Third Leg to Social Statistics

These assorted findings challenge much conventional wisdom about how many and who are suffering as a result of labor market problems. The same conclusions might be reached by careful analysis of the detailed and disaggregated labor force and income data, but the hardship measures provide a systematic integration which provides new perspectives to the public and policymakers who have not been able to piece together the hodgepodge of existing statistics. Those

who do not like what they see from the hardship perspective may argue that the measures distort reality because of the value judgments, assumptions and technical problems implicit in the measures. It may be difficult to accept that so many millions of Americans are unable to support themselves and their families even when they are lucky enough to find and hold jobs, that there has been little or no progress in alleviating hardship over recent years, that the burdens of labor market-related hardship are even more maldistributed than the burdens of unemployment, that the greater public concern with cyclical rather than structural problems may be misplaced, that a rising tide will not lift all boats, and that welfare and workfare must continue to overlap if hardship is to be alleviated for those failing in or failed by the labor market. It may be equally difficult to admit that the unemployment and poverty statistics, which are the foundation of public policy and public understanding, are not effective in perhaps their primary application—measuring who and how many suffer as a result of labor market problems. It is certainly no easy task to learn an entirely new nomenclature, or to adjust and supplement libraries of econometric studies and esoteric analyses which are based on the assumption that unemployment rates are a good proxy for labor market-related hardship. It is a formidable challenge to fine-tune the hardship measures and to modify the underlying survey instruments and approaches in order to improve the accuracy and reliability of hardship statistics. Yet if we are seriously committed to understanding and alleviating the welfare consequences of labor market problems, then the unemployment and poverty statistics must be supplemented by new measures developed to integrate earnings, work experience and income data in a systematic way, recognizing the complexities of varying family status, labor force attachment and patterns of work experience. Social policies must, then, be redirected in light of these new perspectives.

5
Establishment Data and Productivity Measurements

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In the specific area of productivity data and analysis, simple labor productivity measures for the economy (or even for the major sectors) are no longer sufficient with the changing patterns of availability and cost of various inputs—and especially in an economy which has moved away from a century-long dependence upon industrial equipment driven by cheap energy. Measures which relate output patterns to the inputs of labor, materials, energy and capital are deemed essential. These must be coupled with sound analyses of the realities of "tradeoffs" of the input factors which have (or could) contribute to improved efficiency and/or lowered cost—of production and of the finished product.

Productivity measures must reflect today's realities of doing business. Most of the great strides in productivity gains over the past century have come from technological improvements and discoveries—the path to greater output per hour (labor productivity) is through new technologies to investment in new plant and machinery and on to more effi-

cient labor. While it is true that improvements in industrial organization and behavior, as well as enlightened management-labor relationships, also contribute to gains in productivity, the main engine of productivity improvement is through capital.

People are said to be "inquisitive, acquisitive, and lazy." They are "inquisitive" and search out how to do their work better and more efficiently. They are "acquisitive" as they like to acquire the tools to do their jobs better. And, they are "lazy" in the sense that they would rather have machines sweat and toil than themselves. Productivity gains are not achieved by people working harder, but by giving them the tools to work more efficiently and by giving them the incentives to do so.

Labor productivity is a partial productivity measure and, as such, does not reflect the role of capital and the interaction between labor and capital. To quote the Bureau of Labor Statistics (BLS) in the boxed-item of their periodic "Productivity and Costs" report,

> Although the productivity measures relate output to the hours of all persons engaged in each sector, they do not measure the specific contributions of labor, capital, or any single factor of production. Rather, they reflect the joint effects of many influences, including new technology, capital investment, the level of output, capacity utilization, energy use, and managerial skill, as well as the skills and efforts of the work force.

The use of partial productivity measures is appropriate, depending upon the circumstances and their use. For gauging the efficiency of use of all resources, be it at the national level or at a company, productivity measures which include all inputs are the appropriate ones to use.

The making of policy, be it employment, inflation or output, requires empirical measures which correctly reflect our

economic conditions. Such measures will always include some degree of error, but the critical factor is that their *trends* should be as free from *systematic biases* as possible. This study will review several aspects of productivity measurement since such measures represent one of the main economic indicators of our economic well-being: the need for total factor productivity measures; the impact of our changing economic structure; the divergence between hours worked and hours paid; and the undermeasurement of labor in the real estate sector. Before embarking on the analytical sections, it is useful to review why productivity is so important.

1. The "Big Picture"

The United States—and the entire free-world community of nations—is presently in a revolutionary situation. Unfortunately, too few leaders of industry, academia or the government recognize this fact and its significance for the future. Specifically, in the late 1960s the U.S. was still the world's leader in world trade, in standard of living, in science and technology, in the world financial community, and in productivity. By the end of the decade of the 70s, due to a variety of errors of omission and commission together with events outside control of our national leaders, we were in the unenviable position of:

—Suffering three recessions in a single decade, with the terminal one (1980), in the judgment of some experts, continuing through 1981 and the first half of 1982.

—A complete catastrophe in productivity growth, with a slowdown followed by actual declines in output per hour in 1978, 1979 and 1980 (and only about 1 percent rise in 1981).

—Rampant inflation, throughout the decade, with an increase in the late 70s to levels higher than in any former peacetime period.

—Unprecedentedly high interest rates, which stubbornly refuse conventional "cures"; and these rates in turn virtually assuring the collapse of the major construction sector and catastrophic declines in the sale and production of other major consumer durables, particularly automobiles.

—Rates of unemployment higher than in any span since the "Great Depression" of the 30s.

—Tremendous loss of our "normal" international markets for manufactured goods, accompanied by a major—and growing—invasion of the U.S. domestic market by imported manufactures, thus contributing to unemployment and the virtual collapse (present or almost certainly assured for the near future) of major mature U.S. industries.

—Persistent, very large adverse balance of payments.

As a result, the U.S. has lost its former lead in the export of manufactured goods, and its role as the financial bellwether or leader of the Western industrial world's financial community.

Due to the above combination of factors (not the least of which was our extremely weak comparative productivity growth performance) and including the apparent inability of U.S. leaders (of industry, labor and government) to work together to maximize exports, many of our basic industries were either already moribund or very ill indeed; and the U.S. living standard had already fallen to a measurable degree.

2. Total Factor Productivity Measures

The need for productivity measures that include the role of capital as well as labor has long been recognized by the economic community, especially Professors Kendrick, Jorgenson, Denison, and Griliches, among other productivity researchers.[1] Until recently, only labor productivity measures have been compiled and published on a regular basis by the Bureau of Labor Statistics for the private

business economy and six sectors. Since 1980, the American Productivity Center (APC) has been maintaining and publishing total factor productivity using Professor Kendrick's approach.[2] The APC "Multiple Input Productivity Index" program covers the private business economy, six sectors, and thirty segments. Further, the APC measures of output and labor hours are consistent with the BLS measures.

Total factor productivity measures have been periodically published since the late 1950s. Yet, it wasn't until 1979 that the Rees Commission, under the auspices of the National Academy of Sciences,[3] recommended the continuous availability of productivity measures which also include the role of capital:

> Measures of multifactor productivity show changes in the use of all measured inputs per unit of output. Measures of output per worker hour may increase only because inputs of capital or intermediate goods have been substituted for labor inputs. Thus, measures of productivity, which are more complete measures of changes in productive efficiency, generally rise less rapidly than measures of labor productivity.
>
> In any measure of multifactor productivity, weights are needed to determine the shares of the various inputs in the aggregate input measure. These are ordinarily determined by the share of total input value in some base period. The panel recommended that BLS experiment with combining labor and other inputs into alternative measures of multifactor productivity.[4]

The BLS has taken up this recommendation and is planning to publish total factor productivity measures for the private business and other major sectors by the end of 1982.

It is understood that their measure of capital and their approach to adding up the inputs will differ from that used by the APC.

It should also be recognized that by including capital in productivity measures adds to the problems of measuring output and labor, (see Table I). The measurement of capital stock presents more difficulties than measuring output or labor hours, yet the approaches taken to measure capital are consistent and theoretically sound. Such measures, then, are appropriate in capturing broad trends in total and partial productivity.[5]

Labor productivity measures have been telling a rather gloomy story of the progress of the U.S. economy since 1965. Before 1965, labor productivity for the private business economy had been rising at an average annual rate of 3.2 percent. Between 1965 and 1973, the growth rate fell to 2.4 percent; labor productivity dropped even further through 1979 to only a 0.8 percent rate. During the recession years of 1979 through 1981, its rate again fell to 0.5 percent rate, (see Table II).

As dismal as past economic performance is, measured by labor productivity, the total factor measure is even gloomier. Its pre-1965 rate is some 19 percent *lower* than when only the role of labor is measured. Total factor productivity (TFP) grew at an average 2.6 percent rate, as compared to 3.2 percent for labor productivity; over the 1965-73 period, the TFP rate was 1.8 percent. Between 1973 and 1979, TFP was only one-half the labor productivity rate, 0.4 percent, and since 1979 TFP has been declining at a 0.4 percent rate while labor productivity has been increasing. Thus, when capital is included in our measure of productivity, the performance of the U.S. economy is worse.

It is expected that TFP measures should show slower growth than labor productivity. When capital is substituted

Table I
Share of Private Business Economy Output and Inputs Selected Periods
(Percent)

	1950	1965	1975	1981
A. Output				
Private business economy	100.0	100.0	100.0	100.0
Farm	5.7	3.8	3.3	3.1
Nonfarm nonmanufacturing	63.6	63.7	66.2	66.1
Manufacturing	30.7	32.5	30.5	30.8
Goods-producing sector	45.8	45.9	40.9	40.6
Service-producing sector	54.2	54.1	59.1	59.4
B. Labor Hours				
Private business economy	100.0	100.0	100.0	100.0
Farm	17.2	8.2	5.4	4.2
Nonfarm nonmanufacturing	53.7	60.0	65.7	68.1
Manufacturing	29.2	31.8	28.9	27.7
Goods-producing sector	55.3	47.6	41.8	40.3
Service-producing sector	46.7	52.4	58.2	59.7
C. Total Capital Input				
Private business economy	100.0	100.0	100.0	100.0
Farm	18.7	14.5	11.4	10.2
Nonfarm nonmanufacturing	68.7	67.5	70.5	71.4
Manufacturing	17.3	17.9	18.1	18.5
Goods-producing sector	40.4	38.1	34.4	33.6
Service-producing sector	59.6	61.9	65.6	66.4

SOURCES: American Productivity Center; Pace University.

NOTE: Goods producing includes manufacturing, farm, mining, and contract construction segments.

Service producing includes transportation, communications, public utilities, trade, finance and insurance, real estate, and services segment as defined by the American Productivity Center's Multiple Input Productivity approach.

for labor, output may rise, leading to an increase in labor productivity. However, measured TFP would not rise as much since the increase in capital is also included in this measure. In this case, the rise in productive efficiency measured by labor productivity is overstated.

Table II
Labor and Total Factor Productivity
Private Business Economy
(Annual Percent Change, Selected Periods)

	Labor Productivity		Total Factor Productivity	
Period	Rate	Percent Decline	Rate	Percent Decline
1948-81	2.4%	—	1.8%	—
1948-65	3.2	—	2.6	—
1965-73	2.4	25%	1.8	31%
1973-79	0.8	67	0.4	78
1979-81	0.5	38	-0.4	200

SOURCES: American Productivity Center; Pace University.

The Post-1965 Slowdown. The falloff in productivity growth rates since 1965, as well as some likely causes, has been well-documented elsewhere.[6] As exhibited by Table II, both the partial labor productivity and TFP rates have consistently declined in each of the post-war subperiods: in this case too, labor productivity understates the slowdown. Between the 1948-65 and 1965-73 subperiods, labor productivity growth rates dropped 0.8 percentage points, or declined 25 percent. In contrast, total factor productivity growth rates fell 31 percent. The 1973-79 subperiod exhibited an even more severe falloff in its productivity performance from the previous period, declining 67 percent. Again, the TFP rate slowed down even more, 78 percent.

The moderation in productivity rates continued after 1979, but much of this poor performance can be associated with the two (or possibly one) recessions, the last of which we are still experiencing at the time of this writing. It should be noted, however, that the recent year-to-year performance of productivity is slightly encouraging. In 1981, labor productivity reversed its decline of the previous years, and rose at a 1 percent rate. Total factor productivity also increased after several years of declines, at a somewhat milder rate of 0.4 percent. In measuring the post-1965 slowdown of productivity, we again see that it has been much more severe when gauged by the more inclusive total factor productivity measure than when looking at labor productivity only.

3. The Changing Economic Structure

The structure of the U.S. economy has been changing over the post-World War II period, reflecting changing tastes and preferences, new technologies and products, altered resource availability and costs, the impact of taxes and other government economic and social policies, as well as increasing foreign competition. As the economy shifts from a goods-producing to a more service-producing economy, these shifts alone would affect measured productivity.

For example, in 1950 over 17 percent of all hours worked were in the farm sector; by 1965 the farm sector contributed only 8 percent to total private business labor input. Much of this shift in labor was to the service-producing sector. Such a shift would affect measured productivity even if within each sector productivity did not change.

Table II presents the shifts in the U.S. private business economy over the past 33 years. In terms of output, there was hardly any change in the economy's structure between 1950 and 1965; about 46 percent of output was from the goods-producing sector and 54 percent from service-

producing industries: (There was a slight shift from the farm sector to manufacturing.) Between 1965 and 1975, the economy incurred a substantial change in its structure. During this tumultuous 10-year period, the goods-producing sector's share of output dropped to 41 percent, a decline of 5 percentage points. The U.S. economy became more service-oriented, currently producing about 59 percent of output. Further, the manufacturing industries' contribution dropped back to its 1950 share of 31 percent.

Examination of the changing proportions of labor and capital inputs among the major sectors of the private business economy tells the same story: the U.S. is an increasingly service-oriented economy. As of 1981, 60 percent of labor's efforts and over 66 percent of the capital stock is devoted to service-oriented activities including transportation, communications, public utilities, wholesale and retail trade, finance, insurance, real estate, and business services. The farm sector's claim on resources dropped dramatically between 1950 and 1975, but has now stabilized. (The shift from farm to other activities is now over and has been for many years.) Manufacturing continues to claim resources very much in the same proportions in 1981 as it did in 1950.

The Impact of Services. The question then is how this shift from goods- to service-producing industries has affected measured productivity. Many of the more serious problems in measuring real output and capital inputs are associated with the service-producing sector: defining and measuring real output, and defining and measuring real capital stock; even measuring labor inputs for the service-oriented industries is more difficult. We will see that the real estate sector is a case in point. Basically, most of services deal with intangible types of outputs: financial advice, the sale of a house, accounting services, even economic consulting. It is very difficult to define what is the output of a particular ser-

vice. It is even more difficult to measure price changes in order to deflate the output data.

Some analysts have attributed a proportion of the slowdown in productivity growth to the shift from the "more productive" goods-producing to the "less productive" service-producing industries. One reason many analysts consider service industries to be less productive is that output measures may be underestimated, leading to downward biased productivity measures. In order to examine this question, our measure of total factor productivity for private business economy was recalculated, holding the proportion of output, labor and capital inputs at their 1965 levels (see Tables I and III).

The impact of the changing economic structure on total factor productivity is exhibited by Chart I. Between 1948 and 1965 there is a marked difference in the trends of the variable structure total factor productivity (VS-TFP) and the constant structure total factor productivity (CS-TFP). After that period, there is very little difference in their respective trends. The growth rates of TFP bear this fact out (see Table IV); between 1948 and 1965, VS-TFP grew at an average rate of 2.6 percent, some 12 percent lower than the 2.9 percent rate of TFP when the structure is held constant. Over the post-1965 subperiods, the rates of growth of both VS-TFP and CS-TFP are almost exactly the same.

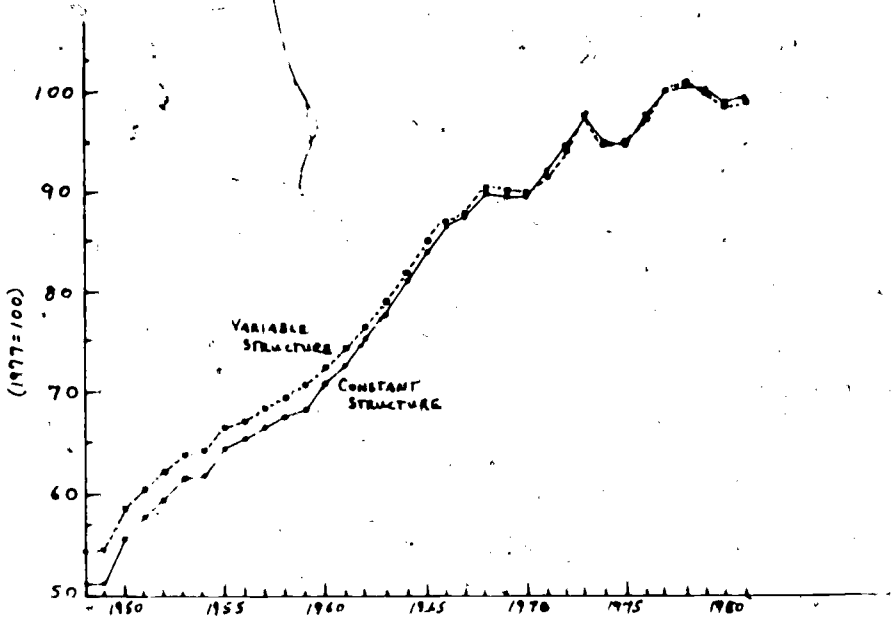
During this earlier 1948-65 period, the proportion of output changed but little (see Table I); the same is true in regard to capital input. The significant changes occurred in the proportion of labor hours; labor hours in the goods-producing sector declined almost 8 percentage points, from 55.3 percent in 1950 to 47.6 percent in 1965. Of course, the service-producing sector gained this amount. Between 1965 and 1975 the goods-producing sector again lost share, about 6 percent, dropping to 41.8 percent.

Table III
Proportion of Private Business Economy
Output and Inputs
as of 1965

	Output	Labor	Capital
Manufacturing	.325	.318	.179
Food	.032	.031	.017
Tobacco	.005	.001	.002
Textiles	.010	.016	.007
Apparel	.011	.021	.003
Lumber	.011	.012	.003
Furniture	.005	.007	.002
Paper	.011	.012	.011
Printing and publishing	.018	.017	.005
Chemicals	.020	.016	.020
Petroleum	.008	.003	.011
Rubber	.009	.009	.004
Leather	.003	.006	.001
Stone, clay and glass	.012	.011	.008
Primary metals	.030	.022	.029
Fabricated metals	.024	.025	.010
Machinery excluding electric	.034	.032	.016
Electrical machinery	.025	.028	.009
Transportation equipment	.044	.034	.017
Instruments	.008	.008	.003
Miscellaneous manufacturers	.005	.007	.002
Nonfarm nonmanufacturing	.541	.524	.619
Mining	.022	.012	.043
Contract construction	.075	.064	.012
Transportation	.051	.050	.070
Communications	.023	.015	.027
Public utilities	.027	.011	.061
Trade	.203	.255	.077
Finance and insurance	.049	.041	.015
Real estate	.061	.012	.193
Services	.127	.140	.176

SOURCES: American Productivity Center; Pace University.

Chart I
Total Factor Productivity
Variable Structure Versus Constant 1965 Structure
1948-1981
(1977 = 100)



SOURCE: American Productivity Center.

Table IV
Total Factor Productivity and Related Indexes by Major Sector (Selected Periods, 1948-1981)

	Average Annual Rates of Change				
	1948-79	1948-65	1965-73	1973-79	1979-81
A. Total Factor Productivity					
1. Variable Structure					
Private business economy	1.8	2.6	1.8	0.4	-0.4
Goods-producing sector	2.2	3.1	2.2	0.4	-0.2
Service-producing sector	1.3	1.8	1.4	0.5	-0.4
Manufacturing industry	2.0	2.6	2.3	0.8	-0.4
2. Constant Structure					
Private business economy	2.0	2.9	1.9	0.4	-0.4
Goods-producing sector	2.5	3.8	2.4	0.4	-0.4
Service-producing sector	1.4	1.9	1.4	0.6	-0.2
Manufacturing	1.8	2.4	2.2	0.6	-0.5
B. Labor Productivity					
1. Variable Structure					
Private business economy	2.4	3.2	2.4	0.8	0.5
Goods-producing sector	2.8	3.8	2.6	0.9	1.0
Service-producing sector	1.9	2.3	2.2	0.7	0.3
Manufacturing	2.6	3.0	2.8	1.5	1.0
2. Constant Structure, 1965					
Private business economy	2.0	2.9	1.9	0.4	-0.4
Goods-producing sector	3.1	4.4	2.9	0.9	0.7
Service-producing sector	1.9	2.4	2.2	0.7	0.3
Manufacturing	1.8	2.4	2.2	0.6	-0.5
C. Capital Productivity					
1. Variable Structure					
Private business economy	0.2	0.8	0.1	-0.5	-2.3
Goods-producing sector	0.3	1.0	0.7	-1.1	-3.1
Service-producing sector	0.2	0.5	-0.1	0.1	-1.5
Manufacturing	0.0	0.9	0.3	-1.5	-4.2
2. Constant Structure, 1965					
Private business economy	0.3	0.9	0.2	-0.5	-2.3
Goods-producing sector	0.3	1.1	0.7	-1.3	-3.6
Service-producing sector	0.4	0.7	0.1	0.3	-1.2
Manufacturing	0.2	0.7	0.2	-1.7	-4.3

Table IV (continued)
Total Factor Productivity and Related Indexes by Major Sector (Selected Periods, 1948-1981)

	Average Annual Rates of Change				
	1948-79	1948-65	1965-73	1973-79	1979-81
D. Real Output					
1. Variable Structure					
Private business economy	3.3	3.6	3.9	2.7	0.6
Goods-producing sector	2.8	3.5	3.2	1.7	-0.9
Service-producing sector	3.6	3.6	4.3	3.4	1.7
Manufacturing	3.3	4.0	4.1	2.1	-1.3
2. Constant Structure, 1965					
Private business economy	3.1	3.5	3.6	2.4	0.2
Goods-producing sector	2.7	3.4	3.0	1.4	-1.3
Service-producing sector	3.5	3.5	4.2	3.3	1.5
Manufacturing	3.1	3.7	3.8	1.8	-1.5
E. Labor Input					
1. Variable Structure					
Private business economy	0.9	0.4	1.4	1.9	0.1
Goods-producing sector	0.0	0.4	0.6	0.8	-1.8
Service-producing sector	1.7	1.2	2.1	2.7	1.4
Manufacturing	0.8	1.0	1.2	0.6	-2.3
2. Constant Structure, 1965					
Private business economy	0.5	-0.1	1.0	1.6	-0.3
Goods-producing sector	0.5	-0.9	0.1	0.5	-1.9
Service-producing sector	1.6	1.1	2.0	2.6	1.1
Manufacturing	0.6	0.9	1.1	0.4	-2.5
F. Capital Input					
1. Variable Structure					
Private business economy	3.1	2.8	3.7	3.1	3.0
Goods-producing sector	2.5	2.4	2.5	2.9	2.3
Service-producing sector	3.5	3.1	4.5	3.3	3.3
Manufacturing	3.3	3.1	3.7	3.6	3.0
2. Constant Structure, 1965					
Private business economy	2.8	2.6	3.4	2.8	2.6
Goods-producing sector	2.4	2.3	2.2	2.7	2.4
Service-producing sector	3.1	2.8	4.1	2.9	2.7
Manufacturing	3.3	3.1	3.6	3.5	2.9

SOURCES: American Productivity Center, Pace University

This significant gain in the service-producing sector's share of labor hours is reflected in the differing growth rates of variable structure labor productivity and constant structure labor productivity. During each of the four post-war subperiods examined, when the structure of output and labor input are held constant, the rates of growth of labor productivity are significantly lower. And the divergence in their respective growth rates increases as we approach the 1980s. Thus, the shift from a goods- to a service-oriented economy has had a significant impact on labor productivity throughout the 1948-81 period, but not significant after 1965 when productivity is measured using the total factor approach.

Again, we see the importance of including capital in the measure of productivity. Interestingly, there is little difference in capital productivity growth rates between the variable and constant structure measures.

Output and Inputs. Table IV also presents the impact on output and labor and capital input growth rates for all three series; and for each subperiod, when the structure is held constant, the growth rates are lower than in the variable structure case. This result is expected since an economy normally shifts output and resources to industries which are experiencing greater growth in demand. Further, higher productivity growth industries tend to have slower rising prices, which encourages increasing demand and output, and higher profit margins, which also encourages and attracts more resources.

Translating these increases in output, labor and capital into faster-rising productivity depends upon their *relative* growth rates. As we saw, the major divergence was in regard to labor productivity, the difference in output growth rates (1948-65) was only 0.1 percentage points, yet labor input declined at a 0.1 percentage rate when when the structure

was held constant, as compared to an actual (variable structure) use of 0.4 percent per annum. The divergence in capital input growth rates over this same period was also minimal, 0.1 percentage points. Here, too, we see that the strong shift in labor explains the divergence in labor productivity growth rates.

Within-Sector Shifts. Shifts of output and inputs within a sector will also impact its measured productivity growth rates. Apparently shifts within the goods-producing sector had a substantial impact on total factor productivity growth rates over the 1948-65 subperiod, 3.1 percent versus 3.8 percent for the variable and constant structures, respectively. After that period, the differences are much smaller. Much of this difference in the early period can be attributed to shifts in labor among the goods-producing sectors. Since there is only a small difference in manufacturing VS-TFP and CS-TFP growth rates, most of the divergence within the goods-producing sector must be due to the shift from farm to non-farm labor in the early post-war period.

Within the service-producing sector, there is very little difference in growth rates of VS-TFP and CS-TFP. Apparently, there have been only small shifts of labor, and output and capital, within this sector.

Rate, Level and Interaction Effects. Gains in productivity can be separated into rate, level and interaction effects. The rate effect is the growth in productivity due to within-industry productivity gains. The level effect is due to shifts in the composition or structure of the economy, holding within-industry productivity constant. The interaction effect is a result of the interaction between the rate and level effects.

The estimates of constant structure growth rates presented above are approximations of the rate effect. Unfortunately, there is no approach available to decompose total factor pro-

ductivity into rate, level and interaction effects. However, it is possible to do so for labor productivity.[7] Using a 60-sector disaggregation, Beebe and Haltmaier estimate the rate and level effects for selected subperiods:[8]

Decomposition of labor productivity (Annual rates of change)

	1948-65	1965-73	1973-78
Private domestic economy			
Total	3.24	2.54	1.00
Rate	2.79	2.22	0.93
Level	0.45	0.33	0.10

This table indicates that the level effect accounted for 13.9 percent of the rate of productivity growth between 1948 and 1965, 13 percent over the 1965-73 period, and 10 percent over the 1973-78 period. In order to isolate which sectors account for the level effect, Beebe and Haltmaier use a two-sector approach, isolating each sector in a separate calculation. Their findings are that farming accounts for most of the level effect, especially in the earliest subperiod, 0.41, 0.18, and 0.05, for the three subperiods, respectively. Our constant-structure approach agrees with their findings.

4. The Hours Paid Bias

The BLS establishment survey known as the Current Employment Statistics Survey (709), has three major problems in regards to productivity measurement:

1. Self-employed and unpaid family workers are excluded. In the BLS sector estimates and the APC sector/industry estimates of productivity, self-employed and unpaid family workers are included, albeit using indirect methods. In contrast, direct industry estimates would be based on imputations by sector of self-employed and unpaid family worker

employment, using estimates from the Current Population Survey. At least this source of bias is addressed.

2. Average hours estimates cover only production workers in mining and manufacturing, and all nonsupervisory workers in other industries. Generally, in calculating total hours worked, average hours of supervisory (nonproduction) are assumed to be the same as nonsupervisory (production) workers. As of 1977, about 18 percent of total workers in nonagricultural industries, and about 28 percent of mining and manufacturing workers had their hours estimated under this assumption. It is not clear what direction this assumption would bias our productivity measures, if any. The trend has been towards working less hours per week, at least until the early 1960s. This trend applies to both supervisory and nonsupervisory workers. More likely, these estimates lead to a cyclical bias in that production workers' hours are lowered during business downturns, but nonproduction personnel hours generally stay the same.

3. The major problem is that the establishment survey measures hours paid instead of hours worked. Hours paid includes vacations, sick-leave, holidays, coffee breaks, and the like. If the difference between hours paid and worked had stayed the same since 1948, productivity *trends* would not be affected, and only productivity *levels* would be biased downwards.

But in reality the trend has been towards more hours that are paid but do not represent work. Evidence on this trend is sketchy but very convincing. In 1966, 83 percent of total compensation was for working time (all nonagricultural industries, see Table V). By 1970 this figure dropped to 81.9 percent, and to 76.7 percent by 1977, the last year such information was published. During this same period, pay for leave excluding sick went from 5.2 percent of total compensation to 6.1 percent. Other evidence indicates that between

1965 and 1976, the maximum allowable vacation of plant workers rose from 3.3 weeks per annum to 3.9 weeks, and from 3.6 weeks to 4.1 weeks for office workers.[9]

This problem was addressed as early as 1976 by the Bureau of Labor Statistics.[10] They recognized the impact this bias has on productivity measures and they attempted to rectify for the lack of hours worked data. After reviewing the several employment surveys conducted by the federal government, they recommended that the Current Employment Statistics Survey be expanded to include hours worked information.[11]

Table V
Percent of Total Compensation
by Type of Activity
All Industries
Selected Years
(Percent)

Activity	1966	1970	1974	1977
Total	100.0	100.0	100.0	100.0
Pay for working time	83.0	81.9	78.2	76.7
Pay for leave (excluding sick)	5.2	5.6	6.0	6.1
Vacation	3.1	3.3	3.4	3.4
Holidays	1.9	2.1	2.3	2.3
Employer expenditures Sick leave	0.6	0.7	0.7	0.8
Wages and salaries (Gross pay)	89.9	89.0	86.3	84.6
Supplements to W&S	10.1	11.0	13.7	15.4
W&S less pay for working	6.9	7.1	8.1	7.9

SOURCE: *Handbook of Labor Statistics*, Bulletin 2070, U.S. Department of Labor, Table 132, "Employee Compensation; Private Nonagricultural Economy, Selected Years, 1966-77," December 1980, pp. 308-318.

In their approach to defining what comprised hours worked, they had several somewhat competing uses in mind, including labor negotiations and productivity measurement. They finally recommended the use of the concept "hours at work," which they defined as "all time during which an employee is necessarily required to be on the employer's premises, on duty, or at a prescribed work place."[12]

> In addition to regular working time where the employee is engaged in productive activity, hours at work thus include short rest periods and coffee breaks, standby or ready time, downtime, portal to portal pay only if paid, washup time only if paid, travel time from job site to job site within the working day, travel away from home if it cuts across the working day, and paid training periods during working hours. Hours at work exclude normal travel time from home to work, unpaid wash time, and lunch time . . . the major items excluded from hours at work are vacations, holidays, and absences due to sickness or personal or civic reasons.[13]

About 90 percent of paid but not at-work time is due to vacations. This definition does include some nonwork time which would be better excluded for productivity measurement purposes, but these items represent a very small proportion of nonwork time.

For illustrative purposes, estimated total hours paid for the nonfarm sector were adjusted to an hours worked basis. The adjustment is based on the evidence given in the BLS Report.[14] This table indicates that hours worked were 95.2 percent of hours paid in 1952, and declined an average of 0.1 percentage points per annum through 1966, the same annual percentage point decline as presented in Table V. Taking the 1952 figure of 95.2 percent as a benchmark, we assumed

through extrapolation that hours worked were 95.6 percent of hours paid in 1948, and 92.3 percent in 1981. (All intervening years were linearly interpolated.)

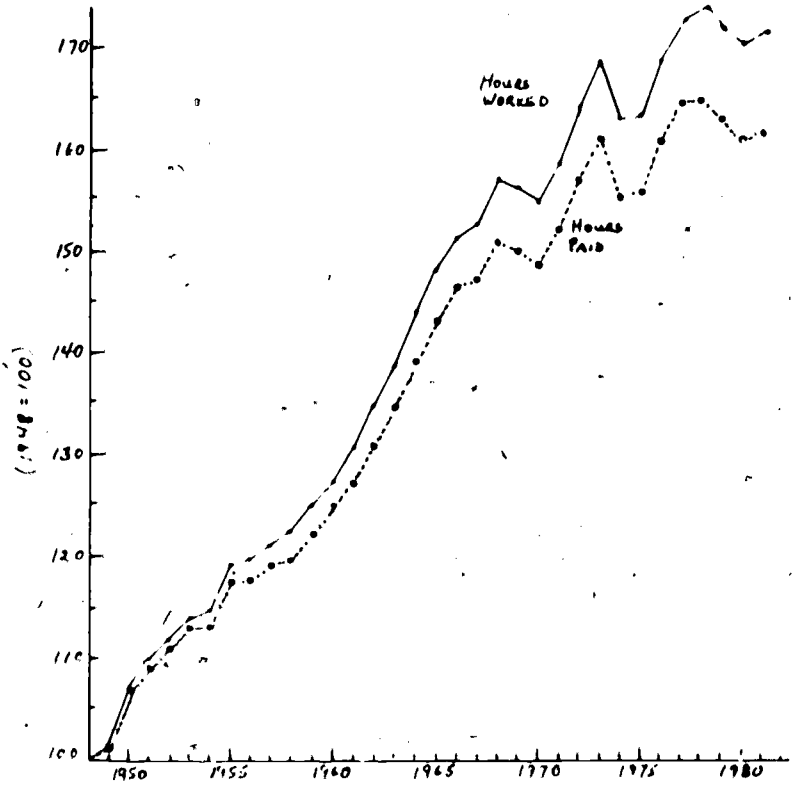
Labor productivity and total factor productivity were calculated using adjusted hours worked labor input. Chart II shows the trends in the hours worked and hours paid measures of total factor productivity (assuming both measures are equal to 100 in 1948). It is clear that the hours paid measures are an underestimate of TFP, and that this bias increases over time.

The differences in rates of growth for the *nonfarm sector* are not very large, no more than 2 percentage points (see Table VI). But over long periods of time, small percentage differences in growth rates lead to substantial differences in *levels.* For example, if it is assumed that total factor productivity using hours worked and hours paid measures were equal in 1948—as was done for Chart II—hours paid TFP would rise 61.8 percent by 1981 (at a 1.5 percent rate) and hours worked TFP, 71.2 percent (at a 1.6 percent rate). The gap between these two measures widens steadily over time and reaches 5.8 percent by 1981.

Using hours paid rather than hours worked leads to an understatement of both the *level* and the *rate of growth* of total factor productivity and labor productivity. While this conclusion implies that the productivity problem facing the U.S. economy is not as bad as has been measured by currently available data, we still must conclude that since 1965 productivity gains have slowed down substantially and that since 1973 they have been nonexistent.

Stafford and Duncan report that their survey "shows that the divergence between hours worked and hours paid accounts for as much as one-third of the productivity slowdown."[13] Further, Norsworthy *et al.* report that the rate of change in the ratio of hours worked to hours paid for the

Chart II
Total Factor Productivity
Hours Paid Versus Hours Worked
Nonfarm Business Economy
1948-1981
(1948 = 100)



SOURCE: American Productivity Center.

private nonfarm business sector was -0.06 percent from 1952 to 1965, -0.21 for 1965 to 1973, and -0.12 from 1973 to 1975.[16]

They conclude that the results are "not striking" but that there "is a small, persistent but variable decline in the ratio of hours worked to hours paid."[17] Neither we nor Norsworthy attribute a significant proportion of the decline in productivity to the divergence between hours worked and hours paid. However, we are in agreement that the BLS should continue with their plans to expand their survey to include hours worked.

Table VI
Total Factor Productivity
Nonfarm Sector

A. Growth Rates, Selected Periods

Subperiod	Hours Paid	Hours Worked*
1948-81	1.5%	1.6%
1948-65	2.1	2.3
1965-73	1.5	1.6
1973-79	0.2	0.4
1979-81	-0.6	-0.4

B. Percent Difference in Hours Worked and Hours Paid**

Year	Total Factor Productivity	Labor Productivity
1965	3.3%	3.3%
1973	4.5	5.7
1979	5.5	7.0
1981	5.8	7.5

SOURCES: The American Productivity Center, Pace University

*For illustrative purposes only

**Assumes that both measures equal each other in 1948

5. Underestimate of Labor in the Real Estate Sector

There is evidence that the Current Employment Statistics program underestimates labor hours in the real estate sector. Traditionally, much of the effort in this sector is by individuals working on a commission basis and on their own time. The establishment survey apparently underestimates the amount of labor effort by nonpayroll personnel and, as such, undercounts the number of employees.

Information provided by the National Association of Realtors (NAR)[18] indicates that the BLS survey is only capturing approximately 16 percent of the total labor force in this sector, which implies that a more correct estimate of real estate labor is about six times the published figure. Another source of underestimation is the average hours paid (worked) per week. Currently, only nonsupervisory workers are covered, and real estate is *not* broken out from the broader finance, insurance, and real estate sector. Therefore, this estimate of average hours must be used in calculating total real estate labor hours.

Table VII presents employee information provided by the NAR.[19] About 84 percent of the total workforce is made up of salespersons, and only 16 percent are in-office personnel. This number appears to be fairly stable over the 1976-81 period. Unfortunately, no data is available prior to 1976 so no trend can reasonably be inferred.

The BLS estimates that nonsupervisory workers are paid for an average of 36 hours per week. Real estate salespersons average over 40 hours according to NAR surveys, and brokers over 50 hours per week. Here, too, we have a rather significant understatement of employee activity in this sector.

Finally, the distribution of gross income indicates that some 13 percent goes to cover payroll-type costs, and 45 per-

cent to commissions, adding up to total labor costs of 58 percent. This proportion is way below estimates of labor's share of total factor costs as compiled from the Bureau of Economic Analysis. In 1978 the APC has calculated that labor compensation; after an imputation for self-employed is added on, was only 8 percent of total factor costs, way below the figure implied by NAR data.

The data provided by the NAR are compelling. Two factors ar highlighted which signal likely labor measurement problems for the real estate sector:

1. The level of real output per hour for the real estate sector is almost 40 percent higher than any other nonfarm nonmanufacturing sector. (In 1979, output per hour was $27.42—in 1972 dollars—as compared to $19.76 for public utilities.)

2. Labor's share of factor income is the lowest of all nonfarm nonmanufacturing sectors. (In 1978, real estate's labor share was 8 percent, about one-fourth the 36.5 percent labor share of the public utility sector.)

Unfortunately, the data provided by the NAR survey would lead to hour and employee estimates which are unrealistically high. Using their data and adjusting BLS estimates of the number of employees and average hours for real estate, we would derive estimates of aggregate hours of 13.6 billion and employment of 6.4 million workers. Even though these estimates are not acceptable, the NAR survey results do indicate that there is a substantial underestimate of labor effort in the real estate sector.

Table VII
Real Estate Sector
Labor Characteristics
Selected Years

1. Employment by Type
(Percent of workforce)

	1976	1978	1981
Salespersons	82.2%	84.0%	84.6%
In-office nonsales personnel	17.8	16.0	15.4
Total	100.0	100.0	100.0

2. Distribution of Hours per Week

	1975[a]		1978	
	Percent under 40	Percent 40 & over	Percent under 40	Percent 40 & over
Salespersons	29.8	70.2	39.2	60.8
Brokers			17.9	82.1

	1981	
	Percent under 40	Percent 40 & over
Salespersons	45.9	54.1
Brokers	23.3	76.7

3. Average Hours per Week

	1975	1978	1981
Salespersons	47	45	41
Brokers		50	51
BLS FIRE[b]	36.5	36.4	36.3

4. Distribution of Gross Income
(Percent)

	1975	1978	1981
Payroll type costs	14.1%	13.3%	13.2%
Commissions	44.0	45.0	46.0
Total labor costs	58.1	58.3	59.2
Other costs (occupancy, communications, advertising, sales promotion, etc.)	41.9	41.7	40.8
Total all costs	100.0	100.0	100.0

SOURCES: National Association of Realtors, The American Productivity Center, Pace University

a. Realtor associates, salespersons and brokers

b. Nonsupervisory worker, Finance, Insurance, and Real Estate

6. Conclusion and Recommendations

In the specific field of employment and hours data, as generated by the Bureau of Labor Statistics, several conclusions are apparent:

1. To properly capture gains in productive efficiency, the role of capital must be included at the sector level, and intermediate materials and energy inputs should be added if measuring productivity at more detailed levels. Because of substitution among the various inputs, labor productivity measures are biased upwards.

2. The shift from a goods-producing to a service-oriented economy had a significant effect on measured productivity in the early part of the post-World War II era, but has not affected productivity growth rates since 1965. If productivity is measured by labor productivity, there appear to have been labor-shift effects since 1965, but these effects are incorrect. The shift to more services has not contributed significantly to the post-1965 productivity slowdown.

3. The current practice of estimating hours paid rather than hours worked by the Bureau of Labor Statistics significantly biases productivity growth rates downwards. While the bias is significant, it does not account for the post-1965 productivity slowdown.

4. For some sectors—especially the real estate sector—the true aggregate of hours devoted to gainful endeavor *and* the number of persons involved in generating the value-added "output" for the sector is seriously understated by the BLS exclusion of "non-office sales personnel." This exclusion undoubtedly exerts some effect in a number of the service industries, but is especially serious for real estate. According to the National Association of Realtors data, not less than three-fourths of the total number of persons gainfully employed by the industry (and probably an even larger

percentage of the hours actually worked) are non-office sales personnel, paid for either entirely or very largely on a commission basis. With this exclusion, the computation of a meaningful productivity *level* (output per hour) is not possible; and with an output per hour *trend* based on perhaps 20 to 25 percent of the total human resources input, the validity is indeed questionable.

The technical problems reviewed here are important but should not detract us from some basic economic problems facing the U.S. economy. Our declining productivity performance, which is clearly evident regardless of any biases in estimation, continues to erode our national vitality and international competitiveness. While the technical recommendations are clear—measure total factor productivity and measure hours at work—how we can revive our economy's efficiency of operation is more difficult to fathom.

As matters stand, it is obvious that the U.S. industrial community of the future will inevitably be altogether different from that of the past. If we are to avoid the fate of nations in the past who fell from the position of world leadership to the status of third-rate or fourth-rate powers, we must:

*Develop new—and high-technology—industries and expand them rapidly;

*Carry out wide-ranging actions to maximize productivity, flexibility and general acceptance of change and new approaches in existing, mature industry;

*Substantially increase diffusion throughout every segment of the industrial community of "best practice";

*Encourage development of the requisite new skills required for new high-tech industries and for the more automated, robotized plants of the future in extant industries;

*Direct improvements in productivity and general operational efficiency in the growing service industry segment of the economy.

In addition to industrial restructuring toward services and technology-oriented industries and improvements in its overall effectiveness, it appears essential that new and imaginative approaches be shaped for on-going collaboration of the government, industry and labor to expand U.S. fabricated goods exports in the world marketplace, plus effective action in exporting efficient, flexible U.S. "services," including transportation, communications, finance and professional services.

Further, it appears likely that the U.S. will also be able—as it must—to expand further its still-extant lead in the production and export of agricultural products. Here, again, new technologies (including hydroponics, photosynthesis and bioregulators) will be required to meet the needs of the twenty-first century and to help assure retention by the U.S. of at least a relatively high standard of living.

NOTES

1. See John W. Kendrick and Elliot Grossman, *Productivity in the United States: Trends and Cycles,* Johns Hopkins University Press, 1980; Edward Denison, *Accounting for U.S. Economic Growth, 1929-1959,* Brookings Institution, 1974; Dale Jorgenson and Laurits Christensen, "Measuring Economic Performance in the Private Sector," in *Measurement of Economic and Social Performances,* M. Moss, ed. Studies in Income and Wealth, vol. 38, Columbia University Press, 1973; John Kendrick, *Understanding Productivity: An Introduction to the Dynamics of Productivity Change,* Johns Hopkins University Press, 1977; Zvi Griliches, "Returns to Research and Development Expenditures in the Private Sector," in *New Developments in Productivity Measurement and Analysis,* Kendrick and Vaccara, eds. NBER Studies in Income and Wealth, vol. 44, University of Chicago Press, 1980; and from the same volume, Frank Gollop and Dale Jorgenson, "U.S. Productivity Growth by Industry."

2. "Multiple Input Productivity Indexes," various issues, American Productivity Center, Houston.

3. Panel to Review Productivity Statistics, National Academy of Sciences; see also, Albert Rees, "The Measurement and Interpretation of Productivity," National Academy of Sciences, 1979; and Albert Rees, "Improving the Concepts and Techniques of Productivity Measurement," *Monthly Labor Review,* September 1979, pp. 23-27.

4. Rees, "Improving the Concepts," p. 25.

5. For a discussion of problems in measuring capital and productivity, see Peter K. Clark, "Issues in the Analysis of Capital Formation and Productivity Growth," *Brookings Papers on Economic Activity,* 2:1979, pp. 423-445.

6. See Kendrick and Grossman, *Productivity in the United States* and Kendrick, "Productivity Trends and the Recent Slowdown: Historical Perspective, Causal Factors, and Policy Options" in *Contemporary Economic Problems, 1979,* W. Fellner, ed., American Enterprise Institute, 1979.

7. J.H. Beebe and Jane Haltmaier, "Disaggregation and the Labor Productivity Index," Working Paper No. 106, Federal Reserve Bank of San Francisco, November 4, 1981, updated April 19, 1982.

8. *Ibid.,* p. 6.

9. *Handbook of Labor Statistics,* Table 110, U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 2000, 1978.

10. U.S. Department of Labor, Bureau of Labor Statistics, "Report of the BLS Task Force on Hours Worked," processed, March 1976.

11. "The Current Population Survey (CPS) is a household survey which collects and publishes data on hours worked for all persons in the civilian labor force. The other major programs collecting hours data survey establishments. The Current Employment Statistics (790) program collects and publishes data on hours paid for production workers only. The EEC survey collects hours paid and paid leave time for both office and nonoffice employees. The Occupational Safety and Health (OSH) survey collects hours worked for all employees." *Ibid.,* p. 11.

12. *Ibid.,* p. 12.

13. *Ibid.,* p. 13.

14. *Ibid.,* Table IX, p. 95. This report also presents evidence that the divergence between hours paid and hours worked differs among industries and type of workers.

15. F.P. Stafford and G.I. Duncan, "The Use of Time and Technology by Households in the United States," in R.G. Ehrenberg, Orley Ashenfelter and R.L. Oaxaca, *Research in Labor Economics,* Vol. 3, JAI Press, 1979.

16. J.R. Norsworthy, M.L. Harper, K. Kunze, "The Slowdown in Productivity Growth: Analysis of Some Contributing Factors," *Brookings Papers on Economic Activity,* 2:1979; pp. 387-422.

17. *Ibid.,* Table 9, p. 411.

18. National Association of Realtors, "Real Estate Brokerage, Income, Expenses, Profits," Department of Economics and Research, 1976, 1978 and 1981.

19. *Ibid.*

6
Longitudinal Labor Market Data
Sources, Uses, and Limitations

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Until recently, most research on labor force behavior and experience analyzed cross section data, which pertain to a population sample at a single point in time. Recent years, however, have seen the development of several longitudinal data bases, which follow the same individuals over multiple points in time.

Two factors have contributed to the development of longitudinal information. One is that convincing research on a number of public policy issues requires longitudinal data. Indeed, without longitudinal data, some important research issues cannot be addressed at all. For example, appropriate public policy towards poverty, unemployment, and welfare dependence rests partly on whether families' or individuals' experience of these states is typically transitory or chronic. Cross-sectional snapshots of the poor or the unemployed, which focus on different individuals at different times, cannot possibly reveal how many of those poor or unemployed at one time remain poor or unemployed at later dates. Such questions of state persistence necessitate longitudinal track-

ing of the same individuals. Still other issues previously addressed with cross section data can be treated with more reliable research methods when longitudinal information is available. For example, longitudinal data have enabled more thorough investigations of the effects of government training programs on earnings and the wage impact of union status.

The second factor is that the cost of developing useful longitudinal data sets is no longer prohibitive. In some cases, computerized matching of existing administrative records can produce inexpensive longitudinal information. In other cases, valuable longitudinal data bases can be generated by computerized matching of existing administrative and survey data. Even where the desired longitudinal information can be collected only by initiating new surveys, the advance of computerized data management systems has made longitudinal data development cost-effective in the last 15 years.

The purpose of this paper is first to describe briefly the major sources of longitudinal data and their relative merits. The discussion then turns to a review of the types of analysis for which longitudinal information has proven especially useful.

Sources of Longitudinal Labor Market Data

Longitudinal labor market data have been generated in three main ways. The first is longitudinal matching of administrative records on participants in government programs. The most prominent example is the Social Security Administration's Continuous Work History Sample (CWHS). This data set contains longitudinal earnings records for a sample of workers covered by the social security program. Another example is the Labor Department's Continuous Wage and Benefit History (CWBH), which contains longitudinal information on the earnings, benefit ex-

perience, and other characteristics of a sample of workers covered by unemployment insurance. The Labor Department has also assembled the Continuous Longitudinal Manpower Survey (CLMS) data, which consist partly of administrative information on a sample of enrollees in programs funded under the Comprehensive Employment and Training Act.

Surveys are a second source of longitudinal data. Longitudinal survy data can be collected either through one-time retrospective surveys that obtain information on individuals' past experience or through panel surveys that periodically reinterview the same individuals. The latter approach is exemplified by the National Longitudinal Surveys (NLS) of labor market experience and the Panel Study of Income Dynamics (PSID). The NLS project, conducted for the Labor Department by the Census Bureau, the National Opinion Research Center, and Ohio State University's Center for Human Resource Research, has followed samples of several age-sex cohorts: men of age 45 to 59 in 1966, men 14 to 24 in 1966, women 30 to 44 in 1967, women 14 to 24 in 1968, and men and women 14 to 21 in 1979. The original sample size for each of the 1960s cohorts was about 5,000 individuals, and the 1979 cohort started with over 12,000 individuals. The wide variety of information collected by NLS, as Michael Borus [3] put it, "includes everything you always wanted to know about individuals that the Census Bureau was not afraid to ask."

The PSID effort, initiated by the Department of Health, Education, and Welfare and conducted by the University of Michigan's Survey Research Center, has collected since 1968 a similarly wide variety of information on a national sample of families that overrepresents low-income families. As some of the original 4,800 families have split and rearranged, PSID has interviewed the originally sampled individuals' new family units so that, despite sample attrition, the sample

has actually grown over time. Other special longitudinal surveys, described elsewhere,[1] include the Longitudinal Retirement History Study, the National Longitudinal Study of the High School Class of 1972, Project Talent, High School and Beyond, and the NBER-Thorndike-Hagen survey.

Another important panel survey is the Current Population Survey (CPS), the monthly national household survey by the Census Bureau that produces the unemployment rate and other regular labor force statistics. Although the CPS is usually viewed as a source of cross section and time series data, it has a panel aspect as well. A household whose address is selected for the survey is interviewed for four consecutive months, dropped from the survey for eight months, and then interviewed for another four months before leaving the sample for good. It is therefore possible to match the survey responses of a household for up to a 16-month period (unless the household moves from the selected address, in which case the household that moves in is interviewed in its place). Compared to the NLS and PSID data, the CPS longitudinal information spans a shorter period, contains fewer variables, and does not follow movers, but it pertains to a much larger sample and, unlike NLS, represents all demographic groups.

A third source of longitudinal labor market data is the series of negative income tax experiments conducted since the late 1960s. Each of these experiments—conducted in New Jersey and Pennsylvania, Seattle and Denver, Iowa and North Carolina, and Gary, Indiana—set up a pilot negative income tax program lasting several years for a selected experimental group, and also observed a control group over the same period. The main purpose was to compare the labor

1 See Borus [3] and Kalachek [8] for more detailed inventories of longitudinal data bases.

supply behavior of the two groups to estimate the likely work incentive effects of a national negative income tax. The data also can be used more generally to explore patterns of welfare dependence and labor market experience among low income families.

Before considering the analytic uses of longitudinal data in general, it is worth mentioning a few of the relative advantages and limitations of different sources of longitudinal data. One important comparison is between administrative and survey data. In cases where administrative files contain the desired data on the appropriate population, the advantages of administrative data are considerable. To begin with, longitudinal collation of data already collected in the process of program administration is less expensive than generating the data with new surveys. Consequently, longitudinal data bases from administrative sources often include larger samples than surveys can feasibly interview. Also, during the period of the sample's program participation, administrative data are relatively free of the problems surveys have with nonresponse and sample attrition. In addition, information from administrative records may, in some cases, be more accurate than information elicited from survey respondents. Survey data on income, for example, are sometimes unreliable. A comparison by Herriot and Spiers [7] of CPS and Internal Revenue Service data on earnings of the same individuals showed discrepancies of at least 15 percent between the two sources of earnings information for almost 30 percent of the matched sample. Despite the likelihood of income underreporting in the IRS data, the CPS earnings data tended to be even lower. Earlier matched comparisons of CPS and census data, initial and reinterview census data, and census and tax data found similar evidence of income measurement error in surveys.[2]

2 Miller [12], Miller and Paley [13], and Pritzker and Sands [16].

On the other hand, whether administrative files *do* contain the desired data on an appropriate sample is a big "if." The information collected for administrative purposes is typically narrower than what is desired for research purposes. The CWHS data, for instance, include only a few variables besides earnings, and even earnings are measured only up to the social security taxable limit. The sparseness of administrative information has led the CWBH and CLMS projects to supplement their administrative data with information collected in interviews or questionnaires.

Furthermore, administrative data may not correspond to the population of interest. The CLMS data, for example, are insufficient by themselves for evaluating the impact of training programs on earnings because the data pertain only to program enrollees. A proper evaluation also requires information on a control group *not* enrolled in training programs. Analysts of the CLMS data have resorted to CPS data matched with social security earnings records to obtain control group information.

In cases where some or all of the desired longitudinal data must be gathered in surveys, it becomes important to consider the merits of retrospective versus panel surveys. Of course, obtaining longitudinal information retrospectively in a single interview is less costly than repeated interviewing. The retrospective, single-interview approach also eliminates sample attrition and yields longitudinal information more quickly. Furthermore, retrospective data are less susceptible to some types of response error. If, for example, a panel survey respondent describes the same job differently in successive interviews or if different interviewers code the same job differently, the respondent may be erroneously recorded as having changed occupations. This sort of error is less likely to occur if the information is collected in a single interview.

On the other hand, panel surveys are less subject to recall error. A retrospective survey respondent that changed jobs five years ago may fail to recall the old job or may forget when the job change occurred. Furthermore, a retrospective survey respondent's recollections might be biased by subsequent events. Of course, just as longitudinal data bases sometimes contain both administrative and survey information, longitudinal surveys can fruitfully combine the retrospective and panel approaches. Indeed, panel surveys typically do collect information retrospectively for periods before and between interviews.

Finally, where a panel survey has been initiated, an important question is how long to continue the survey. This question has arisen recently with regard to whether the 1960s NLS cohorts, originally planned to be interviewed for 15 years, should be followed for another 5 years. The answer depends partly on the advantages of having a 20-year, rather than a 15-year, longitudinal history. Another consideration is that continuation of an existing longitudinal survey is a relatively inexpensive way to obtain current data. Even if the new data will be used largely for cross section analysis, collecting the data from an ongoing panel avoids the costly process of selecting a new sample and developing a new data processing system.

This advantage is at least partly offset, however, by the sample attrition problem. By 1981, all four of the NLS surveys started in the 1960s had lost at least one-fourth of their original samples. Such attrition not only reduces sample sizes, but, if sample leavers differ systematically from sample stayers, it also might cause the remaining samples to be unrepresentative of the corresponding populations. Even in the PSID project, where sample sizes have grown over time because the survey incorporates new family units containing original sample members, it is unclear how well the

current sample represents any population of interest. Therefore, while extending panel surveys generates new data economically, it may do so at a cost of progressively less representative samples. This raises the difficult question of when it is optimal to begin a new survey as opposed to continuing an old one.

Uses of Longitudinal Data

Longitudinal data are particularly advantageous for three types of research: the measurement and analysis of changes in individuals' status over time, the analysis of intertemporal relationships, and analysis that controls for unobserved variables. Although this list of uses may seem abstract, examples of each type will show that these longitudinal analyses often have considerable practical relevance. The examples are intended to serve as illustrations of the kinds of research enabled by longitudinal data, not as an exhaustive compilation of the findings of longitudinal research.

Measurement and Analysis of Change

Cross section data can tell what proportion of the labor force is unemployed or describe the distribution of wage rates of family income at a point in time. In addition, time series of aggregated cross section data are useful indicators of general trends and cyclical patterns in unemployment, wages, income, and so forth. Neither cross section nor time series data, however, can tell how many of those unemployed in one month find employment in the next month or how individuals' wage rates or incomes change over time. Only longitudinal data, which track the same individuals over time, can measure such changes.

An illuminating example is the gross flow data from the CPS. These data show not only how many of one month's unemployed are employed the next month, but also the

magnitudes of all the other month-to-month flows among employment, unemployment, and nonparticipation in the labor force. Furthermore, the underlying data on individuals' changes in labor force status can be analyzed to identify the determinants and correlates of transitions among labor force categories. For example, Barron and Mellow's analysis [2] of May and June 1976 data on a sample of workers unemployed in May revealed that the probability of becoming employed by June was higher for males, those who devoted more time to job search, and those with relatively low reservation wages, and was negatively correlated with receipt of unemployment insurance and length of time unemployed.

While the CPS data on changes in labor force status illustrate the usefulness of longitudinal information, they also illustrate the importance of data accuracy in longitudinal analysis. Woltman and Schreiner [18] have reported evidence that many of the measured gross changes may reflect spurious response changes of persons whose labor force activity has not actually changed. According to monthly average gross flow data for 1977, 48 percent of the CPS unemployed in one month exited from unemployment by the next month. In comparison, when the Census Bureau reinterviewed subsamples of 1977 CPS respondents *with regard to the same month,* 31 percent of those initially measured as unemployed were measured in the reinterviews as employed or not in the labor force. The high variability in responses for the same period raises the disturbing possibility that many, if not most, of the measured month-to-month changes in labor force status may be comprised of response changes that would occur even in the absence of any real changes in status. This is not an indictment of the CPS data in particular, but rather a general indication of the sensitivity of flow data to measurement error and of the special importance of data accuracy when addressing the more delicate questions often asked of longitudinal data.

Another example of the use of longitudinal data for change measurement is research on earnings mobility. Cross section data can reveal what proportion of workers receives low earnings at a point in time, but to measure how many of these low earners *stay* low earners and how many *leave* low-earnings status requires longitudinal information. Lillard and Willis' study [9] of PSID data examined the persistence of low-earnings status among white and black men. They defined low earnings in a given year as earnings less than half the median earnings of male workers in the CPS. They concluded that, of the low-earning men in a given year, about 45 percent of the whites and 65 percent of the blacks would still have low earnings the next year. McCall's study [10] of CWHS earnings records obtained roughly similar results. The similarity of the results from both survey and administrative data demonstrates how the validity of one study can be assessed by comparison with another.

A recurring question in analyses of change or persistence in economic status is whether the observed degree of persistence is due to "population heterogeneity" or "state dependence." For example, Plant's study [15] of welfare dependence asked the important policy question of whether the tendency of welfare families to stay on welfare occurs simply because the same factors that cause them to go on welfare keep them there or whether, in addition, the experience of receiving welfare has some sort of addictive effect that induces continuing welfare dependence. It is usually very difficult to distinguish these two types of processes because their empirical manifestations are so similar. In Plant's study, however, separation of heterogeneity and state dependence was facilitated by the availability of information on both the experimental and the control families in the Seattle-Denver negative income tax experiment. He concluded that the evidence of an addictive state-dependence effect was weak at best. He also discovered that, if he had used

arbitrary statistical assumptions commonly employed in analyses of nonexperimental data, he would have been misled into estimating a much larger state-dependence effect. Despite the difficulty of separating heterogeneity and state dependence, researchers have continued to use longitudinal data to address this important issue in such areas as labor force participation decisions and unemployment.[3]

Analysis of Intertemporal Relationships

Longitudinal data are used not only to measure change in individuals' status over time, but also to relate individuals' experiences or behavior at one time to *other* experiences or behavior at another time. For example, an individual's early labor market experience might affect his earning capacity in later years, or participation in various government programs might affect subsequent economic status. Of course, research on such intertemporal relationships requires information on the same individuals at different points in time, i.e., longitudinal data.

One such use of longitudinal data is Ellwood's study [4] of the impact of teenage unemployment on later wages. He analyzed NLS data on young men who finished school between 1965 and 1967 to relate their work experience in their first four years out of school to their wage rates in the immediately following years. He concluded, "Early work experience has a sizable impact on wages. Controlling for individual effects, experience in the second, third, or fourth year out of school tends to be associated with wage increases of between 10 and 20 percent a year."

Another example is Ashenfelter's study [1] of the effect of federal training programs on the later earnings of program enrollees. His sample included 1964 participants in Man-

3. See, for example, Heckman and Willis [6], Heckman and Borjas [5], and Ellwood [4].

power Development and Training Act programs as well as a comparison group of nonparticipants. He compared the two groups' CWHS earnings records from 1961 to 1969 to estimate the earnings impact of program participation. He concluded that training did increase participants' earnings. He estimated that men's annual earnings were raised, on average, by $150 to $500 in the period immediately following training and by about half as much after five years. For women, the effect appeared to lie between $300 and $600 and did not decline over time.

Analysis Controlling for Unobserved Variables

The third use of longitudinal data is in analysis controlling for unobserved variables. Often in empirical cross section research, the goal is to estimate the effect of a variable X on a variable Y, holding other variables constant. Frequently, however, some of these other variables either are very difficult to measure or simply happen not to have been collected in the data base. The resulting omission of these unobserved variables from the analysis may bias the estimation of X's effect on Y.

An example is research on the wage effects of union membership. Cross section studies have compared the wage rates of union members and nonmembers with seemingly similar characteristics and have found that union members generally receive higher wages. Critics of these studies, however, have argued that union members and nonmembers may differ in ways not observable to the researcher. It could be that the union members, even if they had not been in unions, would have earned more than the nonmembers. Although the cross section studies typically do control for years of schooling, work experience, and other measurable factors, the possibility remains that the estimated union-nonunion wage differential is due to other unobserved factors.

Longitudinal data provide a way of controlling for these unobserved factors. If the effects of unobserved characteristics of the workers stay roughly constant over time, one can estimate union wage effects by examining how the *same* worker's wages change when he changes union status. If workers typically experience wage gains when they become union members and wage losses when they become nonmembers, a positive union impact on wages will be estimated. This estimation approach implicitly controls for unobserved fixed effects specific to individual workers by focusing on wage changes of the same workers over time.

Mellow [11] used this type of approach in his study of longitudinally matched CPS data for two samples, one followed over 1974-75 and the other over 1977-78. He found that union membership is associated with about a 7 percent wage premium, smaller than typically found in cross section studies, but still significantly greater than zero. Mincer [14] conducted a similar study with NLS and PSID data on white males and obtained similar results.

The longitudinal union-nonunion wage studies illustrate some of the pitfalls of longitudinal analysis, as well as its advantages. First, the longitudinal approach may not necessarily eliminate omitted-variables problems. Union joiners or leavers may differ in systematic ways from individuals whose union status does not change. For example, some individuals might become nonmembers because they have been promoted to supervisory positions. For these individuals, union leaving is correlated with wage *gains* due to a factor other than changed union status. Other individuals may lose union membership because they are laid off from union jobs. These individuals may undergo wage losses due largely to the layoff experience rather than to the change in union status. Recognizing that such factors, if omitted, might bias the estimated wage effect of union membership, Mincer separately analyzed the wage changes of union joiners and

leavers, those who stayed union members, and those who stayed nonmembers among those who had quit their jobs and those laid off. His results, it turned out, were not dramatically altered. In the PSID data, for instance, relative to job stayers who stayed nonmembers, job quitters who stayed nonmembers experienced an average wage gain of 9 percent, and job quitters who stayed members gained 10.6 percent. In contrast, job quitters who became members gained 17.2 percent, and job quitters who became nonmembers gained only 0.4 percent. These results—showing especially large wage gains for union joiners and especially small gains for union leavers—remain consistent with the finding of a positive union-nonunion wage differential.

A second problem is response error. Even in a cross section analysis, misclassification of individuals with respect to their union membership status tends to obscure whatever wage differences actually exist between union and nonunion workers. According to the standard econometric analysis of measurement errors in an independent variable in a regression analysis, the resulting bias in the variable's coefficient is proportional to the ratio of the measurement error variance to the sum of the measurement error variance and the true population variance of the variable. In a longitudinal regression analysis, where *change* in a variable is the independent variable, the bias from response error may be worse for two reasons. First, the measurement error variance may be greater because a response error in *either* of two periods can cause an erroneous measure of change. Second, the population variance of *change* in a variable is typically smaller than the cross-sectional variance in the *level* of the variable.[4]

In the case of change in union membership status, there is indeed reason to suspect considerable measurement error. Mincer noted that a disturbingly high proportion of those

4. This point is developed by Taubman [17].

reporting changes in union membership status also reported that they did not change jobs. Suspecting that many of these job stayers had not actually changed union status, he estimated separate wage effects for job stayers and movers. The mover results—such as the ones mentioned above on workers that quit or were laid off—showed more distinct union wage effects than did the stayer results, which probably were biased toward zero by response error. Similarly, Mellow found virtually no union effect among workers that did not change occupation or industry. These results highlight the need to give careful attention to response error when analyzing longitudinal data, especially if the data were obtained in surveys. They also demonstrate the additional care in data collection that may be necessary to obtain answers to the more subtle research questions posed of longitudinal data.

Summary

Recent years have witnessed significant growth in the availability of longitudinal data on labor force experience and behavior. These data—which follow the same individuals over time through surveys, administrative records, or social experiments—have proven extremely valuable for three types of research: measurement and analysis of changes in individuals' status over time (e.g., changes in employment status or income); analysis of intertemporal relationships (e.g., between participation in government training programs and later economic success); and analysis that must control for unobserved variables (e.g., the analysis of union-nonunion wage differences). In some cases, the existence of longitudinal data has opened up avenues of research that simply could not have been pursued otherwise. In other cases, longitudinal data have enabled the examination of previously untestable analytical assumptions and consequently have increased the reliability of research findings.

Despite its great advantages, longitudinal analysis also involves a special problem. Many of the questions addressed with longitudinal data are more subtle than those asked of cross section data, and their analysis is often sensitive to response error. This sensitivity implies first that researchers should attempt to minimize response error in their choice of data bases. In some cases, for example, data from administrative records may be more accurate than survey data. In addition, longitudinal analysts should examine their data for evidence of response error and explore how response error might affect their results. The sensitivity of longitudinal analysis to response error also raises the question of whether longitudinal data collection efforts ought to devote more resources to the reduction of such error.

The overwhelming usefulness of longitudinal data for the analysis of many issues has been established by a continuing succession of valuable studies. Because collection of longitudinal data is still a relatively new endeavor, though, several issues associated with their collection need exploration. One important question is how to weigh the sample attrition problems of continuing an old panel survey against the advantages of following the panel over a longer period as well as the large fixed costs of initiating a new survey. Similar questions pertain to the choice between retrospective and repeated interviews. Finally, there exist important and unexplored tradeoffs in allocating survey resources between interviewing more individuals and improving the accuracy of data on those that are interviewed. Some analysis and perhaps even purposive experimentation with alternative approaches to these issues should make the longitudinal data developed in the next decade even more valuable than those of the past decade.

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7
Summing Up
(based on selective hearing)

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As this conference was proceeding today, a horrible thought occurred to me: Can you imagine the setback for labor force and productivity statistics if anything were to happen to the collection of experts in this room? Now that we have completed a very fruitful and stimulating conference without mishap, I remain the only obstacle to partaking in the happy hour. Let me rush through with my comments, hoping that they will not detract from the high level proceedings of the day.

First, I will summarize what I heard here, even though it may be based on my selective hearing.

Second, I will add some observations which I had hoped would have been made by others. While our data system should be designed to capture the net social impacts of domestic policy changes, there is also a feedback effect. Federal funding allocations and administrative decisions reached by policymakers not only affect society, but they also influence the workings of such public agencies as the Bureau of Labor Statistics and the Census Bureau. The concern is that the products of these fine statistical organizations are facing deterioration.

Third, we should look at the system as a whole and not just individual surveys. Clearly, data collection and publication are not ends in themselves. The question is whether the entire data system helps policymakers formulate and evaluate policies. In many cases, I believe there are serious gaps which we should span.

Parts of the System

Each of the speakers centered in on one part of the total data system. Leon Taub made some thoughtful comments about the Current Population Survey (CPS). He indicated that the richness of the CPS data are adequate for meeting the macroeconomist's basic needs because total employment, unemployment, and other aggregated data respond in a predictable pattern to business conditions. Of course, like any other good researcher who makes a living from forecasting trends, Leon displayed an understandable appetite for a few more numbers; but speaking as a macroeconomist, he gave the CPS a clean bill of health. He did, however, have some reservations when he took off his macroeconomist hat and put on his microeconomist chapeau, which he also wears on occasion. On this level, the data are not adequate to solve many labor market-related problems. He suggested several directions for developing further information, including counting discouraged workers in the unemployment totals, producing better data for local labor markets, and measuring the impact of changes in employment status on household consumption patterns.

After Leon's suggestions concerning new data on labor market effects, Robert Taggart picked up on this same subject. He showed how a great deal more knowledge and insight about labor market operations can be milked from the CPS for very little extra expenditure. He advocated the link-

ing of March CPS data on individual and family income and earnings with labor force status.

The question Bob Taggart raised goes to the heart of the problem: To what extent can we continue to base policies on concepts that were developed in the 1930s and which have not been updated? Beyond numbers reflecting labor force status, we need estimates that link income and earnings with a person's household status. Employment or unemployment data do not measure economic hardship. Bob showed ways in which income, household conditions, and labor force status can be combined to produce estimates of real economic hardship that persist to plague our society. I hope the Census Bureau and the BLS will pay attention to these newer concepts.

Another part of our data system is the establishment survey which supplies the base ingredients for productivity measurements. Elliot Grossman and George Sadler were highly critical of the productivity data that BLS derives from the establishment survey. There was a time when the arcane mysteries of productivity data were mostly of interest to a select group of economists and statisticians, but now they make headlines. Politicians, media persons and even economists on the make are finding these days that a sure fire way to gain attention is to come up with some catchy plan to boost America's slumping productivity.

Elliot and George have questioned not so much the various riverboat gambles the United States has taken to get on a noninflationary growth path; rather they have warned us that we may not have enough information—or the correct data—to navigate the riverboat. We most often have equated the overall changes in economic productivity with only labor output per work hour. More recent concepts, including total factor productivity, consider the relationship between all inputs per unit of output. Unlike the older index, this concept

captures the substitution of capital and energy for labor. Last year, total factor productivity growth was even lower than labor productivity gains.

However, BLS experts warned us today that total factor productivity estimates harbor many problems. For example, how should capital be aggregated, and how should capital be depreciated so that one has a net capital figure? Despite these and other problems, BLS hopes to come out with productivity estimates that move beyond only labor productivity by 1983. I hope they do this because I believe that sound analysis of America's growth problems will require data on more than output-per-work hour data.

Orley Ashenfelter and Gary Solon next discussed the state of longitudinal data and how this newer part of the information system can enrich our understanding of labor force operations. As Orley and Gary already pointed out, I wish we had more data on the cost of these longitudinal numbers because while they provide better insights, they are also expensive. I believe we need to know the comparative costs of this data source compared with using the same outlays in enriching the CPS.

Also, for how long are these longitudinal data good? For example, if one starts a cohort of people between 45 and 59 in 1968, then how long should one continue the survey before too many individuals meet their heavenly rewards? The case for longitudinal data would be far stronger if we knew more about their relative costs and benefits and how we could design panels so that we would maximize the information returns while we minimize expenditures. These concerns are vital in an era of strict budget cutting of nondefense spending.

If I've learned any one message today, it is that we should not rely upon any single number. Clearly, we heard that message from Ken Prewitt of the Social Science Research

Council. Ken spoke at lunch and did not have a formal paper, but his comments on social indicators are important. Social indicator data are derived from longitudinal surveys, such as the one published by the University of Michigan covering 5,000 families, the Ohio National Longitudinal Survey and from public opinion surveys. They illuminate many significant developments that may not be captured in our traditional labor force numbers. Also, as Ken noted—and this backs up the need for longitudinal data—a growing number of researchers and media analysts are interested in change over time and not just a single snapshot picture. Good labor market analysis should consider the information obtained from the emerging social indicators.

Media and Policy Needs

While we cannot rely on a single number, we must remember that when the network television news people report monthly unemployment conditions, they cannot cram that many numbers into a 20-second segment. When unemployment rises one-tenth of a percentage point, to almost 10 percent, all we hear is that this is a record unemployment rate since the 1930s. Can the networks put over the concept that a monthly rise of one-tenth of 1 percent is not statistically significant? We need more than one number, but reporters, just like economists, face resource—in this case time—constraints. The needs of the media people must be considered in forming our data system.

Beyond the introduction of new concepts, such as economic hardship and total factor productivity, is the challenge to factor whatever numbers are generated into the thinking of policymakers and the general public. We can introduce the best new concepts, but without this education process all they will do is remain unused and collect dust.

Deterioration?

Each of the speakers was assigned to examine one part of the total system. While we concentrated on the major labor force surveys, it was beyond the scope of the four papers to comment on recent developments in the general state of labor force data. As part of the budget reductions for non-defense spending, the federal government will provide 20 percent less funding for labor force and other economic data in fiscal 1983 than was spent in 1980. This major budget reduction does not even include the impact of inflation. A statistical system needs ideas but numbers cannot be produced, analyzed and disseminated without money. The system, therefore, faces serious deterioration.

But beyond these funding problems, there is a different form of deterioration that may be even more serious in the long run. Current federal policy contributes not only to the erosion of the existing data system, but also to the stifling of vital research and development that could lead to the introduction of new concepts and methods. There is no better way to destroy the excellence of the total system.

I call your attention to a report that Secretary Raymond Donovan issued, as required by law, when he commented on the recent work of the National Commission on Employment and Unemployment Statistics. Secretary Donovan repeated again and again that—and this is a direct quote—he "cannot in good conscience" recommend any of the Commission's proposals that cost money. I stopped counting this repeated refrain when I ran out of my 10 fingers. Maybe somebody here from BLS has counted exactly how many times he said that.

Secretary Donovan's comments were quite different from the response of the previous Secretary of Labor Ray Marshall. The difference in *how* they made decisions was a great

as the actual difference in results. Six months after the Commission filed its report, former Secretary Marshall said he was in favor of counting discouraged workers as unemployed. But rather than accept or reject the Commission recommendations, he indicated that he would await further study by BLS before he would factor these findings into his final decision. In opposition to this type of reasoned examination of the Commission's proposals, the present Secretary of Labor just completely rejected anything that would cost any money. To make sound decisions one should examine not only the costs but also the benefits obtained from a public investment. While the Reagan administration presumably champions cost-benefit estimates, it appears to have rejected using any sound cost-benefit analysis in this case.

This administration puts a great stress on volunteers, and the Commission suggested a triennial survey of volunteers because of their impact on GNP, and also because there often are very few differences between the work performed by volunteers and paid workers. The cost of such a survey would be well under $300,000 based on BLS estimates and updated for inflation. Public policy calls for more volunteer work, and yet we know next to nothing about the volunteer workforce. Also, we know very little about the extent to which volunteers use their experience to enter the paid labor force. Despite the administration's expressed concerns, the Secretary of Labor rejected the recommendation for the survey.

There are many other examples that are similar to the volunteer workforce data proposals. A major tenet of the Reagan Administration is reducing the role of the federal government by turning over many functions and programs to the states and local governments and providing whatever aid the federal government gives to states and localities through block grants to the states. However, state and local

labor force data are often quite poor. In fact, in many cases the numbers are more guesses than reliable estimates within acceptable margins of error. The Commission made many suggestions to improve state and local data including a boosting of the CPS sample size. This would have yielded reasonably reliable state data as well as statistically significant data for key groups in the population. Instead of boosting the CPS sample, it was cut down to 60,000 under recent budget reductions.

There is a serious question concerning the quality of the statistics if the sample decreases or is even kept at the same level given growing population shifts. For example, data on Hispanics and blacks (and in particular black youths) need to be improved. If "New Federalism" is to be more than a slogan or a subterfuge for cutting federal aid, then state and local data need to be improved.

The damage that we are doing to the system cannot easily be reversed. It seems that under this administration we are going to have to live with deteriorating data which are not as responsive to, and reflective of, real conditions. It took many years to create this system, and it could lose the trust of policymakers and the general public. This would hurt *all* of us, no matter where we stand on other social issues.

I agree with Henry Clay that "statistics are no substitute for judgment," but it is irresponsible to design policies that are based only on sheer ideology (be it liberal or conservative) and gut feelings. Our labor force and productivity data systems could be very strong resources that help put America back on course. Yet given recent trends, I fear we may be dismantling the compass and letting the sextant grow rusty.