The Brookings Institution
Washington, DC

Policy Brief

No. 63
July 2000

Bosworth and Triplett

Numbers Matter

Economic statistics play a vital role in public policy decisions. However, the U.S. statistical system is struggling to keep up with the rapidly evolving nature of the economy.

There are many examples of gaps between information needs and data availability. For example, over the past few months, economists inside and outside government have debated whether the economy has the capacity to satisfy the strong surge in aggregate demand that the United States has experienced in the last year or so without a sharp acceleration of inflation. The critical statistic upon which the debate hinges is output per hour, or labor productivity, which has also surged since 1996.

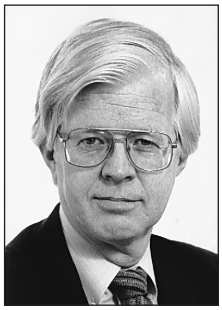
If this higher productivity growth represents a new trend in supply, monetary policy can accommodate the expansion of demand without inflation. But the lack of available statistical data leaves policymakers without adequate guidance, particularly in the case of services. Federal Reserve Board Chairman Alan Greenspan has recently remarked on "disquieting problems with the measurement of productivity, especially in the noncorporate sector," and suggested the need for more detailed productivity data to provide answers to the following questions:

- Is productivity growth sustainable, or is it a cyclical or temporary development that will not persist?
- What are the sources of the recent gains in productivity?
- Are gains evenly dispersed across the American economy, or are they concentrated in just a few sectors?

A second gap between policy needs and statistical availability arises in medical care. Between 1985 and 1995, the medical care component of the Consumer Price Index (CPI) rose 6.5 percent per year, but the overall CPI rose only 3.6 percent annually. When this picture of rapid medical inflation is coupled with existing statistics showing that measured productivity in the medical care industry has actually fallen over the same decade (by 2.2 percent per year), the statistical picture that emerges is one of a troubled industry, with an overwhelming need for new policies to correct its problems.

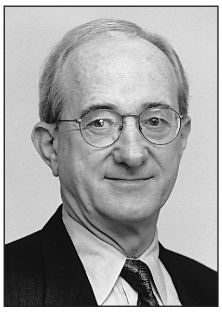
However, new analysis and statistical information is radically altering our view of the medical care industry. Many economists now suspect that the available statistics do not present an accurate economic picture of the industry's performance. As a result, medical price increases are probably lower and productivity higher than the numbers suggest.

Barry P. Bosworth



Barry P. Bosworth is a senior fellow in the Economic Studies program at the Brookings Institution.

Jack E. Triplett



Jack E. Triplett is a visiting fellow in the Economic Studies program at the Brookings Institution.

The U.S. Statistical System and

The Brookings Institution has been conducting a program of workshops and research on measurement issues in the services sectors to focus attention on the problems of measuring productivity in those industries. The workshops have brought together academics, researchers, government policy analysts, and program managers at the major statistical agencies to compare approaches and to assess problems and progress in improving the nation's statistics for productivity analysis. In this policy brief, we discuss some of the difficulties in measuring output of these services sectors, review recent research on individual sectors of the services economy, and summarize the commendable progress on these difficult issues that statistical agencies in the U.S. and Canada have made in recent years.

The Statistical Agencies and the Problems They Face

Economies are continually evolving, which requires that the statistical system also change and adapt to new circumstances. The United States has become a predominantly service-based economy, as goods-producing industries account for only about one-fifth of the nation's output and employment. Yet our statistical system remains heavily focused on goods production.

Identifying the sources of productivity growth, for example, requires accurately measuring output at the level of major sectors and individual industries, and linking that information to corresponding data on the quantities of material and services inputs, capital, and workers that are used to produce it. The U.S. statistical database for manufacturing has the required data, for the most part, but the statistics for the services industries are far less adequate.

The primary statistical database for computing productivity in manufacturing industries comes from the Quinquennial Censuses and Annual Surveys of Manufactures, which the Census Bureau has conducted for decades. These data collections contain a large amount of integrated and useful data on the outputs of manufacturing industries, their employment, investment in capital plant and equipment, and their purchases of goods and services from other industries. Price indexes for deflating the outputs of most manufacturing industries are compiled and published by the Producer Price Index (PPI) program of the Bureau of Labor Statistics. Thus, there is a relatively good database for productivity analysis. But even in manufacturing, the recent growth has been concentrated in the newer high-tech industries where the statistical coverage is least strong.

For services, however, the databases are less satisfactory. The Census Bureau's Annual Services Surveys only began in the 1980s, and still often contain only a minimal amount

of information on individual services industries. In contrast to its good coverage of manufacturing, the PPI price index program had covered only a small fraction of non-goods producing industries by 1990. The information databases for the services and "high-tech" manufacturing industries, which have shown the greatest growth in the past several decades, are insufficient for economic analysis, and are generally inferior to those for the older "smokestack" industries that once accounted for the bulk of U.S. economic activity.

These statistical gaps in the services sector inhibit the analysis of the U.S. economy. For example, the large gains in the efficiency with which we produce computers seems evident in the rapid decline in their price. But have there been similar gains in the computer-using industries? Some analysts have argued that the benefits of the computer are underestimated precisely because computer use is concentrated in services industries, such as finance and insurance, where output is not well-defined or measured.

The medical care industry employs high technology, especially in the form of pharmaceuticals and new technologies. This is an industry that has experienced substantial innovations in medical treatments, introduced many new medical procedures, and undertaken substantial investment in complex medical equipment. Although it is not normally thought of as a computer intensive industry, some kinds of medical equipment are computers in all but name. None of these facts is characteristic of industries with declining productivity, so the present statistical profile of medical care is puzzling. Recently, a number of studies suggest that price inflation in medical care may be overstated through a failure to capture changes in medical outcomes. The statistical problems arise from the difficulty of measuring the output from improved medical procedures and assigning them an economic value.

For a significant number of services industries, such as education and business services, the current statistical system provides no meaningful measure of price changes or real output growth. Output is simply assumed to grow in parallel with employment, which is equivalent to assuming that there is no labor productivity growth.

A Shortage of Resources

These gaps in the statistical system are well-known among users of the economic data. However, despite encouragement from industry representatives and analysts, the statistical agencies have found it difficult to gain the financing to develop measurement programs for newly-emerging industries. For example, the Bureau of Economic Analysis (BEA), which produces both the national accounts and the inter-industry statistics that are used for productivity analysis, has had its budget frozen in nominal terms in recent years. Even the

Census Bureau's proposals to collect new data on the digital economy and expand its e-commerce statistics have not met with congressional approval.

To an extent, statistical agencies can gain resources for services sector measurement by shifting them out of less vital programs. For example, BEA discontinued publication of the "leading economic indicators" to concentrate on its core statistical programs. But shifting their resources from one area to another can only do so much. It is relatively cheap—and still a priority, especially in the high-tech sectors—to maintain existing surveys and measurement methods for the old economy, but it has proved difficult and expensive to develop the tools for measuring the output of the new, services-oriented economy.

Despite budgetary stringency, there are many recent examples of evolutionary and innovative changes in the U.S. statistical system. The Bureau of Labor Statistics' price index research program has contributed to a series of important methodological changes in the CPI that, when brought into the Gross Domestic Product (GDP), raised the estimated growth rates of output and productivity. The Producer Price Index has been expanded since 1990 to cover the output of a growing number of services industries. The national income and product accounts were recently changed to include measures of investment in computer software and a new measure of the output of the banking system that begins to reflect the diverse nature of financial services. The Census Bureau recently released its first estimate of consumer sales over the Internet, reflecting a rapid reorientation of its retail trade surveys to accommodate new forms of retailing.

However, there are also a substantial number of situations where the statistical information is incomplete. For example, within the national accounts, about 12 percent of industry output is still measured on the basis of changes in inputs with no role for potential productivity change. This is done because the required output data do not exist. Nearly all of those problem industries are within the services sector.

Measuring The Output of the Services Sector

The available data suggest that services played a disproportionate role in the slowing of productivity growth after 1973, because measured productivity growth is lower in services than in the manufacturing sector. Some analysts argue that productivity improvements are harder to achieve in services. Others allege that the disparity of performance between services and goods-producing industries is simply a result of miscalculating output. Even if the measurement of each services industry is as reliable as it ever was, mismeasurement is inevitably a greater problem in economic statistics than before, because service-based industries now account for a much larger share of the economy.

What is needed to improve services statistics? If there is an overall message that has emerged from the Brookings workshops, it is that there is no central theme to the problem of output and productivity measurement in services. Each of the industries that we

examined involved unique problems. In many cases, the problems involve developing a clearer concept of the output of an industry and deciding what should be measured.

Conceptual Problems in Estimating Services Sector Outputs

It is often not easy to measure the output of complex goods, like cars or computers, because the quality of what is produced changes from year to year. But the statistical agencies can start by counting the numbers of cars, or computers, or by collecting information on the prices of cars or computers ("deflating" sales with a price index is generally how agencies estimate output growth for most industries). After collecting the initial data, statistical agencies must figure out how to adjust for improvements in quality, which is always the most difficult part of measuring output.

The statistical agencies need the resources to maintain and promote a research agenda in addition to their data collection programs.

In services, it is sometimes difficult to take the first step of determining what the output is. For example, business services contains a diversity of activities, including professional and consulting services (other than legal and financial), advertising, data processing and building maintenance. Management consultants, lawyers, architects, and economists often bill by the hour. It is simple just to count billing hours, or the hourly billing rate. But what is done in that hour? That is the output. Surely, what is done in an hour of business services is greater today than it was in the past, but it is not easy, even for the professionals themselves, to specify what they do in a way that provides a measure of a unit of output.

Another type of conceptual problem is illustrated by financial services. A bank cashes checks and it operates Automatic Teller Machines (ATMs). But the transaction services provided to account holders represent only a small portion of the bank's activities, and they are provided mainly to get deposits that banks lend. Is a bank loan part of its output? If so, is it the number of loans, the size of them, or a combination of both? If ATM transactions are part of banks' output because they are part of the services produced and provided by banks, how should statistical agencies put value on ATM services when they are mostly provided to account holders for free in exchange for the banks' use of their deposits? Statistical agencies encounter similar problems defining and valuing the output of insurance and securities firms.

Resolving conceptual problems like these takes thought and experiment with alternative approaches, and not a simple survey. Often, it requires an iterative process of collecting information, analyzing the results, consulting with industry representatives and others, and then modifying the survey and collecting a new set of statistics. The statistical agencies need the resources to maintain and promote a research agenda in addition to their data collection programs.

Measuring Output in a Rapidly Changing World

In other industries, the problems are centered around the collection of the right kinds of data, and resolving issues that arise from rapid changes in industry structure. For example, much of the innovation in retail trade is reflected in shifts in the distribution of sales among stores with different formats. Yet these shifts are explicitly ruled out in the Consumer Price Index because the survey only tracks the price of a specific product in a specific store. In effect, the shift of sales from department stores to lower-priced discount outlets is treated as a reduction in quality (and therefore output), not a reduction in price. But the growth in the popularity of discount and outlet stores suggests that they provide a net gain to consumers, and at least a portion of the price reduction should be reflected in increased real output. The statistical agencies lack a solid means of distinguishing the real gain from reductions in customer service and increased travel time.

The changing structure of trade has been even more dramatic in the case of e-commerce. The growth of this new industry has been extraordinary, even though it remains very small when measured against the scale of the total economy or retail trade. Some confusion results from the tendency to report the total volume of transactions that were touched by the Internet, rather than focusing on value added or final sales. Moreover, the Census Bureau has already expanded its survey activity to measure retail sales over the Internet. If resources are made available, it appears that e-commerce sales will be fully integrated into the existing statistical system before they get very large. However, less has been done to measure prices of those sales in ways that are comparable to the price of the products in traditional commerce.

More difficult problems arise with the potential for e-commerce to alter business practices and competition among firms, in ways that may impact on productivity and the structure of existing industries. It is less evident what type of information should be collected to evaluate those issues. Many of these firms also emphasize forms of employee compensation, such as stock options and bonuses, that are not well-reported in the existing statistics.

Similar problems arise in medical care. Within the last decade, substantial innovations have been made in measuring the prices for medical care. In 1992, BLS introduced new price indexes for health care in its Producer Price Index program which incorporated a new methodology for measuring the price of medical care. Rather than pricing the cost of a day in the hospital, as did the historical Consumer Price Index, the BLS attempts to the measure the cost of treatment for specific medical conditions. Overall, the new PPI indexes present a picture of lower medical care inflation, compared to the CPI for the period where the two overlap. BLS subsequently introduced similar methodology into the CPI.

Even with the new methodology, it has been difficult for BLS to find data to adjust for changes in the efficacy of treatment. There is some controversy on how far statistical agencies should go in incorporating measures of treatment efficacy into price and output

measures, but we doubt if anyone seriously disagrees that the price index should be "adjusted" or corrected in some fashion for improvements in medical outcomes. Because medical economists generally believe that progress has been made in medical technology in the way of better prognoses, shorter hospital stays, and less painful treatments, they believe that inadequate adjustment for changes in medical technology creates upward biases in price indexes for medical care.

There is less agreement, however, on how to value those changes. In the PPI, the Bureau of Labor Statistics looks for information on the change in costs that are associated with improvements in medical efficacy. In contrast, some economists argue for a greater focus on the value of those improvements to the patient. For example, the greater utility to the patient of less unpleasant treatments, and the value of reductions in unwanted side effects (a less painful medical procedure, a less onerous regimen, or a shorter recovery time) are all elements that might go into a measure of medical outcomes. But some of the improvements in outcomes go outside the traditional "market boundary" of economic measurement. Should they go into an economic accounting for medical care? If so, how should they be valued? Stating the problem in this way underscores the difficulties the statistical agencies face in producing price indexes for medical care.

The accelerating pace of economic change suggests a need to restructure the existing statistical system.

What to do?

The United States still has one of the world's best statistical systems. But it is evident that the system is faced with severe challenges in its efforts to keep up with the evolving nature of the economy. Much of the recent growth of the economy has been in sectors that are poorly measured by the existing reporting system. In some cases, such as electronic commerce, the primary need is to expand the existing network of surveys to capture the new firms and products in a timely fashion. But in other cases, the growth of the digital economy is highlighting an old set of problems—growth in industries for which output was never well defined or an acceleration of changes in the structure of industries and products that complicates the measurement of quality change.

The accelerating pace of economic change suggests a need to restructure the existing statistical system, expand its resources, and refocus it toward better reporting of the service sectors of the economy. While some of the change will have to be in the form of new surveys of the services sectors, there is an equal or greater need to expand the research on what type of questions to ask. How should we define the output of these industries and how should we distinguish between changes in prices and the quality of service? This suggests the need to expand research by the statistical agencies to resolve the myriad measurement issues. That research must also be coordinated with the affected industries whose cooperation is critical to arriving at a common set of definitions and agreement on a feasible program of measurement.

Brookings gratefully acknowledges the generosity of the Cabot Family Charitable Trust for its support of the Policy Brief series.

The Brookings Institution

1775 Massachusetts Ave. N.W.
Washington, DC 20036

NONPROFIT ORG.
U.S. POSTAGE
PAID
BOWIE, MD
PERMIT NO. 4434

Recent Policy Briefs

- *Resurrecting the Estate Tax*
  William G. Gale and Joel Slemrod (June 2000)
- *Engaging Problem Countries*
  Richard N. Haass and Meghan L. O'Sullivan (June 2000)
- *The Internet and the New Economy*
  Alan S. Blinder (June 2000)

Related Books

- *The Federal Budget: Politics, Policy, Process (Revised Edition)*
  Allen Schick with Felix LoStracco (2000)
- *Measuring the Prices of Medical Treatments*
  Jack E. Triplett (editor, 1999)
- *The New Relationship: Human Capital in the American Corporation*
  Margaret M. Blair and Thomas A. Kochan (editors, 1999)
- *Setting National Priorities: The 2000 Election and Beyond*
  Robert D. Reischauer and Henry J. Aaron (editors, 1999)
- *Aging Societies: The Global Dimension*
  Barry Bosworth and Gary Burtless (1998)

Finally, it is becoming more and more apparent that the decentralized structure of the U.S. statistical system is contributing to the problem of inadequate economic measurement. U.S. statistical agencies, in contrast to those of most other industrialized countries, cannot exchange and share data collected in closely-related programs. For example, both the Census Bureau and the Bureau of Labor Statistics collect industry employment, mostly from the same firms, which is not only wasteful in terms of agency resources, but imposes unnecessary and duplicative reporting burdens on cooperating firms. Bringing at least some of the major U.S. statistical agencies into a single, integrated, partly "centralized" statistical agency (which exists in most other countries with high quality statistical systems) might free up resources for attacking problem areas and lead to more efficiencies and better integration of economic statistics. It might also increase respondents' voluntary cooperation with important U.S. data collection activities.

This and all previous Policy Briefs are also posted on the World Wide Web and linked from the Brookings home page at

www.brookings.edu

If you have questions or comments about this Policy Brief, please send an email message to policybriefs@brookings.edu

Authors' responses will be posted on the Brookings website.