

BEA's Strategic Plan for 2001–2005

BEA published a preliminary strategic plan in the December 2001 *SURVEY OF CURRENT BUSINESS* and invited public comment. The plan, which incorporated suggestions from BEA's customers, staff, and partner statistical agencies, presented the elements of BEA's planned work and initiatives through 2005. As development of the preliminary strategic plan neared completion, Secretary of Commerce Donald E. Evans and Secretary of Treasury Paul H. O'Neill asked BEA to convene experts in the fields of economics and business and solicit their opinions and insights on the expansions and improvements to the national accounts necessary for capturing the changing economy. Participants in that meeting, held in November, 2001, included members of the Administration and other Federal Government and private-sector experts. The private-sector experts comprised the members of BEA's Advisory Committee—distinguished economists and business people—and two invited guests, both distinguished economists.

Abstracts of the comments of those attending the meeting follow. They begin with Commerce Under Secretary for Economic Affairs Kathleen Cooper's introductory remarks and end with BEA Advisory Committee Chair Professor William Nordhaus's overview of targets for developing and

broadening the national accounts. The comments reprinted here range from specific suggestions for improvements in the accounts to broad suggestions for recasting and expanding the accounts.

The revised plan is presented here, beginning on page 20, in table form by national economic account. The table summarizes each component of the plan and provides milestones through 2005 that serve as checks on progress toward the stated goals.

The strategic plan will be updated later this year to add milestones for FY 2006 and to reflect changes in priorities and opportunities. The activities listed in the revised table and the timing of the milestones are based on the assumption that BEA will receive adequate budget funding for each of those years.

I would like to thank the members of the BEA Advisory Committee and the expert commentators and the customers and other respondents for their valuable contributions to the refinement and further development of BEA's strategic plan.

J. Steven Landefeld
Director, Bureau of Economic Analysis

Kathleen B. Cooper

Under Secretary for Economic Affairs, U.S. Department of Commerce

I want to thank each of you for your attendance today. One of the pleasures of public service is to be able to draw on the thinking of such a distinguished group of economists for their insights—members of the Bureau of Economic Analysis advisory committee and special guests for this brainstorming session, Marina Whitman and Robert Hall. Let me also welcome and acknowledge Richard Clarida from the Treasury Department and Randy Kroszner from the CEA, who will share their perspectives with us. I must thank as well Lawrence Slifman from the Federal Reserve for joining us and for providing input on behalf of the Federal Reserve.

This is a brainstorming session, not a place for speeches. We would appreciate your expert evaluation on the design and composition of the national income and product accounts. Secretary Evans, Deputy Secretary Bodman, and I are committed to working with you to ensure that our national accounts meet the high standards demanded by today's economy.

During today's session, Richard Clarida will report to you that Treasury Secretary O'Neill shares these goals. Steve Landefeld, the Director of the Bureau of Economic Analysis, and I expect this session to be the first of several

and hope you can participate throughout and share your recommendations to help guide our future work on the national accounts.

We have already begun a number of important changes here at BEA to improve the national accounts. Working closely with the President and the Congress, we received funding to begin the important task of upgrading the GDP to improve our measures on important sectors of the economy, including the impact of IT and telecommunications, pharmaceuticals, financial derivatives, and various forms of compensation. In addition, BEA took initial steps to address long-overdue and urgently-needed improvements to the reliability of its GDP processing system, while at the same time developing and beginning to implement a comprehensive plan to improve its performance. Other changes over the past year have been important first steps in providing electronic filing for respondents to BEA surveys and easier and expanded access to BEA's Web site through interactive and easily downloadable data sets, which has been widely praised by data users.

In the upcoming year, BEA, with the support of the Administration, will be working on a number of initiatives to improve the quality and timeliness of economic statistics. Your contributions today will be important in fleshing out these activities. Indeed, BEA has made excellent strides in updating its strategic plan. What we learn from you will help us put the finishing touches on it.

Somewhere down the line in this process of improvement in the accounts lies the hard work of finding the financial resources for new initiatives, but that is not the business of today. Again, I thank you for accepting our invitation today and look forward to hearing your thoughts on this important topic.

Richard H. Clarida

**Assistant Secretary for Economic Policy, U.S.
Department of Treasury**

The goals of the Bureau of Economic Analysis and the Treasury Department with regard to the national income and product accounts are broadly the same. We share a desire for the most accurate, detailed, and timely reporting possible of economic activity. BEA has long been recognized as the world leader in the field of statistical measurement of the economy. We wholeheartedly support BEA's continuing efforts to improve the accounts.

Secretary of Treasury Paul O'Neill has expressed a special interest in this endeavor. As the result of his experience as Chairman and CEO of Alcoa and President of International Paper, he believes that, to the extent possible, policymakers should have ready access to "real-time" data on the economy on an aggregate and sector-by-sector basis. The availability of more timely statistics—sensitive to subtle changes in the economic climate—would enhance the decision-making ability of policy officials. The Secretary has directed Economic Policy (EP) to investigate new frameworks for organizing and interpreting economic information. These efforts have already resulted in improvements in the way EP presents and interprets the vast array of weekly and monthly indicators on the economy that are produced by BEA and other government agencies. The Treasury is also interested in encouraging efforts, such as those featured in a recent Staff Research Study Number 26 by the International Trade Commission (ITC), to assemble and organize information on the global commercial activity of U.S. multinational firms. The goal here is to make available in a timely and useful fashion, data on direct investment receipts and payments derived from sales made by foreign affiliates. This information, in conjunction with the data already provided on cross-border trade, would, in the words of the ITC report (pages 1–8) "provide a more complete perspective on how U.S. firms are faring in global markets, irrespective of their chosen mode of delivery."

The U.S. statistical system has been without peer in its ability to respond to changing economic conditions and the statisticians at BEA are to be commended for their leadership in introducing innovative new measurement techniques. But world business activity is changing even more quickly. We look forward to working with you to find the best ways to capture new developments.

Lawrence Slifman

**Associate Director, Division of Research and
Statistics, Federal Reserve Board**

It has been our experience at the Federal Reserve Board in putting together our estimates of industrial production and capacity utilization that much of what needs to be done to improve our estimates can only be done by the statisticians equivalent of house-to-house combat—that is, improving our measures one detailed item at a time. I think that many of my comments on BEA's Strategic Plan fall into this category. Of course, for BEA the task is even more difficult because it must rely, to some extent, on a complementary "house-to-house" effort at the Census Bureau that would provide BEA with more detailed data from its economic programs on a more timely basis. Finally, I recognize that adopting my suggestions will not be costless; without additional funding for BEA and the economics programs at Census, implementation of my high priority items might well displace someone else's high priority items. That said, let me proceed with my wish list.

The fundamental conceptual and statistical building block of the national income and product accounts (NIPA's) is the input-output system and related items (for example, commodity and capital flow tables). It takes about 5 years from the time the quinquennial economic censuses are conducted until the input-output (I-O) system is rebenchmarked. Consequently, in November 2001, the national accounts were still based on estimates of the structure of the economy as it existed in 1992. Obviously, the structure of the economy has changed dramatically since 1992. If the accounts are to adequately portray the nature of economic activity currently, it is critical that the Census Bureau provide BEA more promptly with the data it needs to rebenchmark the I-O system and that once BEA has the data, it should proceed with rebenchmarking as quickly as possible.

Closely related to the I-O program at BEA is the work on measures of output by industry. As noted below, I would like to see a number of improvements to the measurement of the information technology (IT) sector. But in the context of the industry accounts, it would be extremely helpful to economic analysts to have more detail on IT industries—that is, at a finer level of disaggregation.

BEA already has a number of specific improvements to the accounts that are in train or have been proposed. Let me note a few that I think should be given high priority.

- Improvement of price measures, especially prices of services where the nature of the output is not easily defined, such as financial services and medical services.
- Develop data sources that will eliminate (or at least reduce) the reliance on trends for quarterly estimates

of PCE services.

- Improve the measures of stock options and other types of variable pay.
- Continue the effort to achieve better integration of the NIPA's and the flow of funds accounts.

Related to some of the proposals in BEA's Strategic Plan is the issue of the Taxpayer Compliance Measurement Program (TCMP). The last time the IRS conducted TCMP audits was in the late 1980s. A new TCMP could potentially be extremely helpful in reconciling income and spending measures of GDP and in understanding other anomalies in the national accounts.

With regard to the IT sector, there are several areas where more work could be done both at the Census Bureau and at BEA.

- It would be very useful to researchers and BEA if the Census Bureau collected and published on a monthly basis data on the orders, shipments, and inventories of IT-equipment manufacturers at a finer level of disaggregation. For example, currently the monthly Census report gives information for manufacturers of communications equipment and semiconductors at the four-digit NAICS level, compared with the six-digit level for motor vehicles.
- Data sources should be developed that will help BEA do a better job at splitting sales of PCs among purchases by consumers, businesses, and governments.
- BEA needs to continue to do more work on developing appropriate deflators for a wider variety of IT equipment.
- The strategic plan calls for improving BEA's measures of depreciation for IT equipment. This initiative is extremely important and should be given high priority.

I'll conclude with a comment on the presentation of NIPA information. Currently, BEA produces a sector table for motor vehicle output quarterly and tables for farm and housing output annually. It would be helpful for many types of analysis to have more sector tables and to have them at a quarterly frequency. Examples include the energy and aircraft sectors and, perhaps, the insurance and pension sectors.

Randall S. Kroszner

Member, Council of Economic Advisers

Improving the reliability and timeliness of Federal statistics is an important and essential function of the Bureau of Economic Analysis, and the Council of Economic Advisers lauds their efforts. Recent economic developments underscore the importance of high-quality economic statistics. The economic slowdown this year—especially in the aftermath of the terrorist attacks on September 11—significantly altered the economic environment facing the Administration. Having high-quality

data has been critical to designing appropriate policies to address the new challenges.

There is, of course, plenty of room for further improvement. One notable sign of a problem in our Federal statistics was this year's sizable GDP annual revision, which highlighted the need to collect data more frequently on the software industry. Another sign has been the large and growing statistical discrepancy between the output and income measures of GDP. The discrepancy indicates that the accuracy in measuring aggregate economic activity is deteriorating. This partly reflects the fact that the input-output tables—upon which GDP statistics are constructed—have become increasingly out-of-date and raise important questions about the accuracy of industry estimates of economic activity.

A key challenge facing BEA, and other statistical agencies, is to determine how best to continue to improve our Federal statistics in an environment of tight budget constraints. There might be, of course, several ways for BEA to proceed, but let me mention a few that deserve particular attention. One way is to be more selective in the choice of data to collect, process, and disseminate. There is already a priority in our Federal statistical programs to streamline existing programs, and considerable progress has been made over the years. BEA might consider taking a more aggressive approach to replacing existing, low-priority statistics programs with new programs aimed at better measurement of emerging economic trends.

Another way is to focus on increasing the efficiency of existing programs in order to stretch scarce budget dollars further. One possible initiative to achieve greater efficiency is to promote data sharing among Federal statistical agencies. It also has the potential to reduce reporting burdens on the public and improve the quality of the statistics for policymakers as well as researchers. For example, if even limited data sharing among BEA, Census, and BLS were allowed, BEA might be able to better integrate labor, capital, and output data, thereby providing a more accurate measurement of economic activity and a better understanding of how the economy works. I would be interested in hearing from others about concrete benefits to BEA from enhanced data sharing.

Currently, however, statutory barriers generally prevent statistical agencies from sharing data they collect with other agencies (especially for data production purposes), and new legislation would be required to enhance access across agencies. It should be noted that some of these barriers have played an important role in safeguarding the privacy of survey respondents because there are very different confidentiality standards under which various Federal statistical agencies operate. Hence, any expansion of data sharing powers would likely have to be coordinated with changes in confidentiality standards.

A good way to make progress on data sharing is to build on the previous efforts. The Statistical Efficiency Act of 1999 is a good example of the types of reforms that

should be considered. The Act included enhanced data sharing among Federal statistical agencies and also strengthened confidentiality provisions to safeguard the privacy of survey respondents. It is important to note that the House passed the Act in a bipartisan fashion, but it stalled in the Senate.

BEA should also continue to seek opportunities to partner with the private sector in order to boost efficiencies. To be sure, the private sector could help collect data and even help to process and disseminate it. For example, retail chains have extensive computer tracking systems for real-time purchases—a wealth of untapped data on consumer spending patterns. And high-tech firms have excellent information on inventories, sales, and prices, which could help to provide a better snapshot of innovations that are driving the “new economy.” The key issue is how can a partnership be structured so that it does not compromise the high quality of Federal statistics that we have come to expect: How difficult would it be for BEA and other statistical agencies to set standards and oversee the data collection efforts of the private sector? Is it possible to carefully design safeguards to ensure privacy and confidentiality? Can contractual obligations be enforced to guarantee that private sector partners would maintain the quality and comparability of the data over time? Would partnering with the private sector allow Federal statistical agencies to respond more flexibly to structural changes in the economy? What cost advantages might arise from such partnerships?

Robert E. Hall

Robert and Carole McNeil Joint Professor of Economics, Stanford University, and Chair of the NBER Business Cycle Dating Committee

I appreciate the opportunity to represent the National Bureau of Economic Research (NBER) at this session on the future of the accounts. Let me begin by reacting to some of the various suggestions that other panel members have provided. First, it’s an interesting question as to the value of a monthly estimate of GDP. I know that from my perspective, as Chair of the NBER Business Cycle Dating Committee, we are uncertain about how we might use a monthly estimate of GDP in our work. The current recession has made us think more than before about the relative importance of employment and output. In past recessions, the two have moved together, because productivity remained constant or fell during the recession. With the continuation of rapid productivity growth during the current recession, we find a mild contraction in output (quarterly GDP) with a normal contraction in employment. Monthly GDP would assist in determining peak and trough dates, especially to those whose definitions of recessions emphasize output. I personally (not as Chair) tend to emphasize employment, so quarterly GDP

would play a fairly small role in my personal chronology.

Among the agenda of items that BEA is considering, I suggest that further work on software should be a priority. The new economy has been propelled by general-purpose technology that is very flexible and includes both hardware and software. Rapid speed of innovation is a characteristic of the new economy. You can build an application on Oracle in 3 days that would have taken months in the 1980s. Wal-Mart, with one million-plus employees, owes its success to general-purpose technologies, but its contributions are not yet fully measured.

In pursuing this further work on software, the focus should be on final demand, because intermediate products come out in the wash. Without adequate valuation of final products, the contributions to real value of goods and services provided to consumers by the companies using the products of Oracle and Sun Microsystems are not measured. Other examples where the value of services provided to consumers is not measured is the convenience value offered by services such as eBay, Travelocity, and southwest.com.

Another area of work that I would endorse is the Jorgensonian framework. This provides a more comprehensive view of the economy, going beyond value added to total product flows, integrating GDP-by-industry flows with financial flows, and doing further work on intangibles.

Alan J. Auerbach

Robert D. Burch Professor of Economics and Law, University of California, Berkeley

I am particularly interested in three areas of data enhancement:

- Integration of the Federal Reserve financial data and BEA’s capital stock and savings data;
- More comprehensive measures of international capital flows, including derivatives and other instruments; and
- More comprehensive measures of compensation, including stock options, bonuses, etc.

Therefore, I would appreciate a discussion of the steps that BEA plans to take in each of these areas; that is, what will we have that we don’t have now?

Also, it may be unrealistic to hope for this, but I would find it very helpful if some gauge of accuracy were available with initial GDP estimates. Growth rates are subject to considerable revision, and a statement of the “plus or minus” interval would be useful. Presumably, such a confidence interval would be based on past experience with revisions. Especially around turning points, where even the sign of the change in GDP is hard to predict, this additional information would provide an important caution to users of the statistics who are not particularly well-informed about the revision process.

Dale W. Jorgenson

**Frederic Eaton Abbe Professor of Economics,
Harvard University**

The first issue to be addressed is, why do we need a new architecture for the national accounts? In this context, "architecture" refers to the conceptual framework for the national accounts. An example of such a framework is the United Nations' System of National Accounts 1993 (SNA93). This provides a complete accounting system, including income and expenditure, production, capital formation, and wealth accounts. The purpose of such a framework is to guide the conceptual development of a system of national accounts.

A conceptual framework for the national accounts should be carefully distinguished from a specific plan for improvements to the accounts, such as the BEA strategic plan. The strategic plan focuses on BEA's own plans for the future and is very important in laying out priorities and eliciting responses from the user community. However, the plan does not provide a rationale for the priorities or relate BEA's plans to those of other statistical agencies with interests in the national accounts. This is a particularly important omission in a decentralized statistical system, like the Federal system in the United States.

An illustration of an issue that would be part of a new architecture is the integration of the national income and product accounts (NIPA's) with the capital formation and wealth accounts that form the flow of funds accounts, produced by the Federal Reserve Board (FRB). BEA has made important progress in developing the asset side for such a system through its capital stock study. And the results have been incorporated into the national balance sheet by the FRB. However, new architecture or new thinking is required to link the balance sheet to the generation of incomes and products.

The second issue to be considered is, why not use SNA93? SNA93 would be part of any new architecture, since it embodies the collective experience of the national accounting community and is familiar to many people working on the U.S. national accounts. However, it fails to provide the income and product accounts in current and constant prices needed for many applications of the national accounts, such as estimation of potential output. Consistency in the boundaries among the various component accounts is an unresolved issue in SNA93. Wealth, for example, refers to a different set of economic units than income and product.

A more fruitful approach begins with the NIPA's and develops a system of capital formation and wealth accounts with the same boundaries. This could be linked to the generation of incomes and products, so that the income and expenditure and the production accounts could be presented in current and constant prices. These accounts could be generated at both aggregate and indus-

try levels and would provide a link to productivity measurement, a critical omission in the original formulation of national accounting systems by Simon Kuznets, Richard Stone, and the other originators of these systems.

An important advantage of the approach I have suggested is that the NIPA's would remain unchanged, at least initially. Improvements in the source data would continue to provide better estimates, including better deflation of outputs. However, the NIPA's would be extended to encompass wealth accounts and these would gradually be integrated with the NIPA's along the lines I have suggested. The new architecture would provide a new approach to national accounting that builds on the United Nations' system but would gradually supersede it.

To illustrate some of the implications of the new architecture, I will consider the production account as an example. A detailed illustration of this account is given in my Presidential Address to the American Economic Association ("Information Technology and the U.S. Economy," *American Economic Review*, March 2001, pp. 1–32.) This takes BEA's concept of gross domestic product (GDP) as a point of departure and adds estimates of capital and labor inputs to convert gross domestic income to constant prices. These estimates incorporate capital data from the BEA capital stock study.

I have just completed a new paper giving detailed production accounts by industry. These incorporate the BEA interindustry transactions accounts. ("Information Technology, Higher Education, and the Sources of Economic Growth across U.S. Industries," with Mun S. Ho and Kevin J. Stiroh, to be presented to the Conference on Research in Income and Wealth, Washington, DC, April 26–27, 2002.) For each industry the output is BEA's "gross output," and the input is broken down by capital, labor, and intermediate inputs. Each of these is presented in current and constant prices.

The key innovation in this production account is the introduction of the concept of the flow of capital services. This is employed in the NIPA's in measures of the rental value of housing. The new architecture extends this idea to all categories of assets included in the BEA capital stock study. A parallel concept of the flow of labor services is broken down by age, sex, education, and class of employment with individual components weighted by total compensation per hour worked. The detailed architecture is laid out in Paul Schreyer's *Productivity Manual*, published by the Organisation for Economic Co-Operation and Development in 2001.

What are the next steps in developing a new architecture for the production account? The first order of priority should be development of a conceptual framework for integrating the NIPA's and the BEA interindustry transactions accounts. This has been done by Robert Yuskavage ("Priorities for Industry Accounts at BEA," paper presented to the BEA Advisory Committee, November 17, 2000). A very important detail is providing a time series

link between the industry accounts before and after the introduction of the North American Industry Classification System (NAICS).

A longer-term issue is consideration of production of annual interindustry transactions tables on the same schedule as the NIPAs. This is already done by the Office of Occupational Statistics and Employment Projections at the Bureau of Labor Statistics (BLS), but using less detailed data than in BEA's annual tables. However, the BLS tables are available at the same time as the NIPAs. Unfortunately, they do not incorporate the latest information from the annual revisions of the NIPAs. A system for producing the two data sets simultaneously is already in place in Australia and Canada and has been adopted by the United Kingdom. This should be considered by BEA.

The third step would be construction of a production account at both aggregate and industry levels along the lines I have suggested. Fortunately, much of the required work is already available, at least in prototype, in the papers I have written on the production account. These are carefully integrated with the NIPAs and other data sets produced by BEA, such as gross product originating, the capital stock study, and hours worked. Unfortunately, my papers inherit some of the gaps in the BEA data sets, such as the inconsistency between the NIPAs and the interindustry transactions accounts.

I have sketched the new architecture for the production account of the NIPAs as an illustration of the conceptual work to be done. Similar issues arise for the income and expenditure account, as well as the capital formation and wealth accounts, which should be considered together. The first of these can be considered within BEA, but involves important practical issues, such as reconciling commodity flow and expenditure data on personal consumption expenditures. The second involves agreement on a common architecture with the FRB and implementation of a joint program to produce wealth accounts on the same schedule as the annual NIPAs.

A further development of this architecture, foreshadowed by SNA93, would add satellite accounting systems modeled in the integrated system. For example, nonmarket activity related to time use could be compiled in the form of production, income and expenditure, and wealth accounts. Barbara Fraumeni and I have done this in a series of papers, focusing on investment and saving in the form of human capital. (Reprinted in my book, *Postwar U.S. Economic Growth*, The MIT Press, 1995, pp. 273–388.) This would provide guidance to statistical agencies outside BEA for developing satellite systems consistent with the NIPAs.

The idea that national accounting is a field that has become isolated from the rest of economics can now be laid to rest. There are many exciting problems that lie ahead in developing a new architecture for the national accounts, and many of these will require the skills in economics that have been developed by the BEA staff. Mem-

bers of the staff will find enthusiastic support from the academic research community with interests in economic measurement. Economists are on the verge of creating a new way of measuring and understanding our new economy.

Robert J. Gordon

**Stanley G. Harris Professor in the Social Sciences,
Northwestern University**

BEA has made much progress. I like the cooperation that is occurring between government and academic economists. The U.S. leads the world in quality-adjusted prices. I also like the speed-up that is occurring in GPO-by-industry estimates. My priorities include a regular publication of reconciliations of various government estimates, particularly between the NIPAs and the flow of funds accounts. Other reconciliations should include the CPI and PCE deflators, GPO by industry and corresponding BLS estimates of productivity and output, and the index of industrial production and the NIPAs. I would like to see the publication of quarterly real capital stock estimates, and I want better investment deflators. The use of scanner data should lead to improved CPI estimates. There are problems with some matched-model estimates. Price indexes for nonresidential construction are also in need of improvement. Finally, I would like to see more historical research; for example, why have the 1929–48 growth rates been revised up?

Marina v.N. Whitman

**Professor of Business Administration and Public
Policy, University of Michigan**

It's difficult to add much to the very thorough analysis that has already occurred. The data required to implement the suggestions are in principle available; the issue on the Government side is whether the necessary resources—money and people—can be made available and, on the corporate side, whether companies are willing to collect and compile the necessary data, which in some cases can be a major task.

As regards the need for better, more complete, and more timely data, one can only say “yes indeed,” but one must also recognize the trade-off between the speed with which initial estimates come out and the potential size of later revisions.

In particular, better data on services are essential, and becoming more urgent as services' share of our national GDP continues to increase. Furthermore, services are less likely than goods to be provided across national boundaries in the form of exports or imports as traditionally defined, since they generally require both investment and presence in the local market to be served. This fact links

the growing importance of cross-boundary services to the need for alternative measures of international trade and finance in the balance of payments accounts, an issue that I'll discuss in more detail later.

As regards interactions between financial and real markets (that is, integrating BEA's NIPA and balance-of-payments accounts with the Fed's flow-of-funds and balance-sheet accounts), what is needed is not only better data on derivatives and other financial instruments, particularly for short-term and portfolio capital flows, but also, for direct foreign investment, a clearer distinction between the *physical location* of an investment and its *sources of financing*. And, within the direct foreign investment accounts, means should be found to reconcile flows with changes in stocks. Currently, they tend not to match up at all (sometimes even the signs are different), even when valuation changes are taken explicitly into account.

Currently, the U.S. balance on goods and services in our balance-of-payments accounts is measured according to the traditional "residency" concept: Things produced in the United States and sold abroad are defined as exports; things produced abroad and sold here are imports. The "alternative" measure under discussion substitutes the concept of "ownership" for that of "residency"; goods and services produced by American-owned firms anywhere in the world are "exports," while those produced by foreign-owned firms, even if physically located within U.S. borders, are counted as "imports."

The growing focus on this alternative measure reflects the vast increase in the complexity of American multinationals' activities, a development that has been a major factor in global economic integration, as well as the recognition that trade and direct investment are often complements, as opposed to the traditional view that they are competing channels through which to serve markets abroad. In fact, as companies have sliced and diced the value-added chain into ever-finer pieces, overseas sales by U.S. firms' foreign affiliates (either for local sale or as inputs into exports to the home country or to third markets) have increased substantially in importance relative to exports directly from the headquarter's country.

The question of whether the residency or the ownership concept is more relevant to the distinction between "domestic" and "foreign" goods and services has been on the radar screen at least since the early-1990s debate between Bob Reich and Laura Tyson regarding "who is us?". The question is relevant for a variety of national policy issues—including, for example, the question of which firms should be eligible for membership in government-private partnerships, such as the Clinton Administration's Partnership for a New Generation of Vehicles, that contain an element of public subsidy.

In fact, the answer differs with the question at issue. Where returns to labor, in the form of jobs and wages, are concerned, it is the residency concept that matters; for

returns to capital, the ownership concept is generally more appropriate. The ownership concept also dominates with respect to the United States' economic influence on the world economy, the global competitiveness of American firms, and issues regarding market access for these firms. And, contrary to long-held beliefs, neither concept is fully adequate where pressures on currency markets are the issue. Thus, the answer to the question "which one should we track and measure?" is in this case "both."

The expanded use of the alternative definition poses issues of its own, however. Among them are:

- Just how should "net" be defined? A National Academy of Sciences report subtracts purchased goods and services to arrive at its definitions, while the BEA/Julius version subtracts these plus payments to foreign labor and capital. Which is the correct definition depends, again, on the question at hand. The former is a measure of the globalization of American multinationals' activities, while the latter measures their direct impact on the economy of the United States and of those other nations where U.S.-owned multinationals conduct activities.
- How is "control" defined? In traditional balance-of-payments accounting, 10-percent ownership is the dividing line between "portfolio" and "direct" investment. But if one includes any ownership level below 51 percent, there is a potential for double-counting; in principle, the controlling interest in the firm could reside in more than one country.
- The term "ownership" is itself ambiguous. Should one weight ownership by the fraction of a firm's total shares held in each country? And is it even possible to collect such data?
- What are the implications of the alternative measure of goods-and-services accounting for its mirror image in the financial accounts?

Stepping back for a better view of the forest, two broader questions arise:

- How reluctant will firms be to collect and compile the data necessary for either definition of netting, whose requirements are far more detailed and complex (and therefore more expensive in both time and money) than simply gathering data on gross sales in each country where the firm does business?
- As intrafirm trade has grown as a proportion of total trade, issues of internal transfer pricing have loomed larger with respect to such policy issues as taxation, dumping, and others. But with the continuing breakup of the value-added chain and the wide variety of partnerships, alliances, etc. that are continuously coming into being, the boundaries of a "firm" may themselves become increasingly fuzzy, implying that it may become harder to tell "us" from "them" at the level of the firm as well as that of the Nation.

William D. Nordhaus

A. Whitney Griswold Professor of Economics, Yale University, and Chair of the BEA Advisory Committee

The U.S. national economic accounts are by necessity a work in progress. Their unfinished state is in part due to the limited resources available to any statistical agency. But even more it reflects the underlying evolution in the nature and composition of the economy, changes in available source data, improved statistical and economic methodologies, and increased linkages with the world outside our borders, along with changes in the priorities of those who use the accounts. These incessant changes require a parallel philosophy among those who design and produce the accounts.

There are many possible targets for developing and broadening the national economic accounts. In this brief overview, I will list three that appear to be central to me. The first category, improving the core accounts, involves relatively straightforward extensions of the current activities of BEA. The second, integration of income and capital accounts, requires a new initiative and improvements in underlying source data. The third category, developing satellite accounts on nonmarket activities, will require new methodologies but will illuminate our society in ways that cannot be captured by existing market accounts.

Improve timeliness, accuracy, and coverage of core accounts

The U.S. national income and product accounts (NIPA's) arose in response to the Great Depression. Measures of national output at that time were incomplete and produced with a long lag, so policymakers had only impressionistic views of economic trends based on scattered financial and industrial data. The first accounts were developed at the Commerce Department in collaboration with the National Bureau of Economic Research under the leadership of Dr. Simon Kuznets, who received the Nobel Prize for his pioneering role in that work. These accounts were submitted to the Senate in 1934 and published as a Senate document.

Since that time, the "core accounts," which consist of the major accounts for income, product, and expenditure, have been developed and expanded in many directions. Among the important developments have been sectoral and regional accounts as well as series that illuminate trends in national saving and investment, per capita output and income, the return to capital, inflation, productivity, the shares of income going to different factors of production, international linkages, and the sources of economic growth. The current core accounts are an essential ingredient for analyzing U.S. economic

conditions and trends.

Given the continuing importance of the core accounts, I would point to three general areas that could use some tuning up.

Recommendation 1. The first priority for BEA is continuing to improve the coverage and detail of the core accounts.

Continuing to develop and improve the core accounts should clearly be the top BEA priority. The BEA strategic plan contains many elements for improving the core accounts.¹ Among the most important items to improve existing accounts, I would place the following: Development of a full set of integrated income and wealth accounts; more timely publication of the input-output data; continuing the development of the industry accounts with a full set of comparable historical data; improvement of source data with particular attention to the income side of the accounts; ensuring a smooth transition to the new North American Industry Classification System (NAICS); and improved measurement of real output in those sectors where price indexes are deficient. Some of these will be discussed in greater detail below.

In addition to the ongoing work on improving and developing the core accounts, I point to two areas that deserve particular attention.

Recommendation 2. Working with the Bureau of Labor Statistics (BLS), BEA should work to improve the price indexes underlying the national accounts.

It is little appreciated that the Government virtually never measures "real GDP." Rather, real output is derived from nominal output and the associated price indexes. For this reason, developing accurate price indexes is critical for the accurate measurement of the real side of the national accounts.

One of the most exciting areas for those working with government data has been the improvement in price indexes over the last two decades. BEA has been in the forefront of this movement, first with computer prices, and then, working with BLS, in many other areas.

Much progress has been made—but much work remains to be done. BEA and BLS need to continue to develop realistic price indexes for those areas of the accounts where input-type measures are used (such as in financial services and health care) or where the deflators are not closely related to the actual good or service to which it is associated. Additionally, BEA and BLS should continue to march ahead in improving their measures of quality change and the inclusion of new products, particularly with the introduction of hedonic techniques where appropriate.²

1. See "BEA's Preliminary Strategic Plan for 2001–2005," SURVEY OF CURRENT BUSINESS (December 2001): 23–39.

Recommendation 3. BEA should work to improve the timeliness and accuracy of its reports and to develop an experimental monthly GDP series.

One area of continuing importance for the national accounts is to produce data that will improve our understanding and therefore our managing of business cycles. The economic history of the recession of 2001 will ultimately be written based primarily on the data coming from the national accounts along with data from the labor market.

Currently, the “advance” GDP estimates are published at the end of the first month following the end of the quarter to which they refer. The timing and quality of the advance estimates are limited by the absence or poor quality of certain key data, such as those on inventories and international trade. It seems likely that a modest investment in improved source data in a few key areas can shift the entire schedule of releases forward by 1 or 2 weeks. While I know of no formal studies of the value of early information in this area, the value is likely to be many times larger than the cost of gathering the required new data to prepare more reliable and timely GDP estimates.

BEA prepares estimates for the major output and income series averaged on a quarterly and annual basis. I have never understood why the subannual basis for the accounts was quarterly rather than monthly, weekly, or semiannually, although I would guess that this practice arose because company accounts, which were originally so critical to national accounts, were presented on a quarterly basis.

I would recommend that BEA consider developing the major income and product accounts on a monthly basis. Indeed, at present many components of the accounts (incomes, production, and prices) are already available on a monthly basis. Consumption, government spending, inventory changes, foreign trade, labor market data, and virtually all major income measures except profits are available on a monthly basis. It would appear relatively straightforward to develop procedures for estimating or interpolating the missing variables on a monthly basis. It should be emphasized that the only current monthly output measure, the Federal Reserve's monthly industrial production index, is unrepresentative of the economy in that it covers less than 20 percent of GDP and omits the entire service and trade sectors.

There are many reasons for developing monthly GDP, but one important reason is that it will provide more timely and useful information on the pattern of cyclical movements. The business cycle of 2001 provides a useful illustration. Most economic data indicated that the econ-

omy was slowing from early 2001 and that the trauma of 9/11 had accelerated the downturn. Forecasts in late September and October 2001, particularly those from the New York financial community, were extremely gloomy. Data on sensitive sectors, such as travel and finance, tended to reinforce the gloom.

Because of the peculiar shape and timing of the 9/11 aftermath, the quarterly GDP data were unhelpful for forecasters and policymakers. The sharpest economic reaction to 9/11 probably came in late September and early October 2001, but this would have affected only one-sixth of the data for the third quarter. The major impact on GDP, if there were one, would be seen in the fourth quarter, whose advance and incomplete estimates were not available until January 30, 2002. Indeed, it was not until the preliminary estimates became available on February 28, 2002, that it became clear that real economic growth for the fourth quarter of 2002 was safely in the positive range. The growth rate for the second half of 2001 was essentially zero, and indeed, based on output movements, the recession appears to be the mildest in post-World War II history.³

Without the actual monthly GDP data, we cannot know how the pattern of output in late 2001 would have looked. But it is surely possible that by November 2001 discerning eyes would have suspected that the downturn was very mild and that the recession had essentially come to an end. Whether major policy errors were made in anticipation of a serious recession will have to wait for further analysis, data, and reflection.

Monthly GDP will be no panacea for policymakers. It may prove highly volatile and subject to excessive revisions. However, given BEA's existing data, it would seem useful to provide monthly GDP data on an experimental basis.

Improve and integrate asset and wealth accounts with income and product accounts

The next set of suggestions involves issues that are directed toward major conceptual gaps in the U.S. economic statistical system that BEA is most centrally posed to fill. While there are many issues, I will focus on developing a full set of asset and wealth accounts and linking those with the income and product accounts.

Historically, BEA has focused its work on developing income, expenditure, and product accounts, along with elaborations in terms of sectoral, regional, and international detail. Much less attention has been devoted to asset and wealth accounts, or to linking the asset and

2. A useful recent review of issues and potential improvements in constructing price indexes is contained in Charles Schultze and Christopher Mackie, eds., *At What Price?: Conceptualizing and Measuring Cost-of-Living and Price Indexes*, National Academy Press, Washington, DC, 2001.

3. A discussion of the pattern of output and other cyclical indicators along with a comparison with other postwar recessions is contained in William Nordhaus, “Puzzles About the American Economy in the Current Recession and Recovery,” forthcoming, *Brookings Papers on Economic Activity*, 2002:1. A draft of the paper is available at <http://www.econ.yale.edu/~nordhaus/homepage/recent_stuff.html>.

wealth accounts to the income and product accounts. At present, BEA maintains a detailed set of accounts on capital and capital formation, while the Federal Reserve has the financial complement of that in its flow of funds accounts. However, the United States at present does not have a comprehensive set of asset accounts that is conceptually consistent with and linked to the income and product accounts.

In this respect, it is instructive that we speak of the NIPA's rather than the national economic accounts. One of the major tasks of BEA and its sibling agencies should be to broaden the U.S. accounts to encompass a comprehensive set of national economic accounts linking production, income, consumption, accumulation, and wealth. The development of a set of national economic accounts is a major feature of the internationally developed system of national accounts (SNA).⁴ Many of the principles and practices involved in a comprehensive set of national economic accounts have been realized for the United States in the Jorgenson set of accounts.⁵ In moving toward a set of comprehensive accounts, the United States would also help achieve the important goal of harmonizing its accounting practices with those of other countries.

Recommendation 4. *BEA should work with the Federal Reserve to develop a full set of asset and wealth accounts.*

Recommendation 5. *BEA should develop a full set of linked national economic accounts that include production, income, consumption, accumulation, and wealth.*

These recommendations are really two prongs of a common research project, which is to elaborate the wealth and asset structure of the United States and to make the linkage of the asset and accumulation accounts to the income and product flows.

The major purpose of such a set of accounts would be to provide a full and consistent framework for understanding the evolution of income, capital formation, and wealth. I will sketch two important applications here: Resolving the ambiguity about techniques for measuring the national and personal savings rates and improving current measures of saving and investment.

The first point involves conceptual difficulties in measuring savings. The traditional product-account (or NIPA) measure of saving in the national income accounts is the difference between current income and consumption. The NIPA definition contrasts with the asset-

account definition, which is (or should be) the change in real net wealth. The difference between the production-account and the asset-account definitions became particularly large during the asset bubble of the late 1990s. Data compiled by Gale and Sabelhaus indicate that for the 1990–99 period, the personal savings rate was a meager 3 percent of income using the product-account definition and a healthy 17 percent using the asset-account definition.⁶ A similar calculation by Lusardi, Skinner, and Venti found the net asset-account savings rate for 1999 was 45 percent while the NIPA savings rate was 3 percent.⁷ An integrated set of accounts, with a reconciliation table for different concepts, would help policymakers and analysts keep the different concepts and numbers clearly in mind.

A second set of issues concerns the narrowness of current product-account measures of saving and investment. It is not generally recognized that current measures of investment and saving cover an extremely limited sphere, including only investment in tangible capital (such as factories, equipment, inventories, and houses) along with software. Current concepts omit a wide variety of investment-type activities. Some important omissions are the acquisition of tangible nonhuman capital—such as consumer durables by households; development of land; expenditures for research and development; expenditures for education; the opportunity costs of students' time; the opportunity cost of training; and much of the Nation's expenditures for health.

It must be hard to explain to a student or a Secretary of Commerce why the purchase of a factory to produce a new drug is investment while the expenditure on research on that drug is not; or why building a new library is investment while purchasing new books for the shelves is not. We have only the sketchiest of estimates for the size of the omission, but estimates by Eisner indicated that the standard definition might underestimate the national saving and investment rate by as much as 500 percent.⁸ Recent studies of Jorgenson and Fraumeni lead to similar conclusions.⁹

A great capitalist country such as the United States needs a fully developed set of capital accounts.

The challenge of accounts for nonmarket activity

A final important challenge for the longer term lies in the area of nonmarket accounts. The national income and

4. The SNA, developed under the aegis of the United Nations and other international agencies, is a set of concepts, definitions, classifications and accounting rules. The latest SNA is from 1993 and can be found at <<http://esa.un.org/unsd/sna1993/introduction.asp>>.

5. The Jorgenson set of accounts is described in Barbara Fraumeni, "The Jorgenson System of National Accounting" in Lawrence J. Lau, ed., *Econometrics and the Cost of Capital: Essays in Honor of Dale W. Jorgenson*, MIT Press, Cambridge, Massachusetts, 1999.

6. William G. Gale and John Sabelhaus, "Perspectives on the Household Saving Rate," *Brookings Papers on Economic Activity*, 1999:1.

7. Annamaria Lusardi, Jonathan Skinner, and Steven Venti, "Saving Puzzles and Saving Policies in the United States," Dartmouth College Working Paper 01–04, February 2001.

8. See Robert Eisner, "Extended accounts for national income and product," *Journal of Economic Literature*, December 1988, 26:1611–1684, Table S.5 for comparisons of market and comprehensive income and saving measures.

9. Dale W. Jorgenson and Barbara M. Fraumeni, "Investment in Education and U.S. Economic Growth," *Scandinavian Journal of Economics*, 1992, Supplement, pp. 51–70.

product accounts are the most important measures of overall economic activity for a nation. Nevertheless, since their original development, there have been concerns that the accounts are incomplete and misleading because they do not cover vast continents of nonmarket activity such as unpaid work, the value of leisure time, much investment in human capital, and, most recently, the impact of and on the environment.

The four recommendations in this area involve research, methodology, developing the framework, and data collection to begin the construction of nonmarket accounts. These activities should be undertaken jointly by BEA, other Federal statistical agencies, private researchers, along with the activities in other countries, but BEA can play a key leadership role in organizing these efforts.

Recommendation 6. BEA should work with other government agencies and with private researchers to begin development of the framework and data collection for a set of nonmarket accounts.

The threshold question is why should we devote scarce intellectual and governmental resources to studying nonmarket sectors? The basic reason is that economic and social welfare does not stop at the market's border but extends to many nonmarket activities.

Three particular areas are worth emphasizing. One important reason why we need better measures of nonmarket activity is because we spend increasingly fewer of our lifetime hours in market activities. A second and more speculative reason concerns the growing importance of nonmarket assets or mispriced market assets such as the environment and technology. A third reason, highlighted above, is that current measures of national saving and investment are defective because they omit much of the investment that takes place outside the marketplace. I will highlight three priorities in developing nonmarket accounts: green accounts, time-use studies, and health accounts.

Recommendation 7. Among the priorities for nonmarket accounts is the development of a set of resource and environmental accounts.

Critics of conventional accounts point to their omission of the contribution of natural resources and the environment to economic activity. Environmentalists argue that America's wasteful, consumptive ways are squandering our precious "natural capital." This issue was partially addressed when BEA unveiled its integrated environmental and economic satellite accounts (or IEESA's), designed to estimate the contribution of natural and environmental resources to the Nation's income. The first step, published in 1994, was a set of accounts for subsoil assets including oil, gas, and subsoil minerals.¹⁰

Many were surprised by the results of this first assay into green accounting. BEA's estimates take into account

that discovery adds to our proven reserves at the same time that extraction subtracts from or depletes these reserves (whereas both these activities are omitted from current core accounts). In fact, these two activities were almost exactly offsetting in the period BEA investigated. The net effect of both discoveries and depletions from 1958 to 1991 was between minus \$2 billion and plus \$1 billion, depending on the method used, as compared with an average GDP over this period of \$4,200 billion (in 1992 prices). Another important finding was that the rate of return to nonfinancial capital was reduced by 1 to 2 percentage points when depletion was accounted for.

A full set of environmental and resource accounts would require further work to develop accounts for renewable resources (such as timber and water) and environmental assets (such as the cost of emissions or the impact of air pollution on the economy and human health). Although a great deal of work has been done on valuing components of air quality, to date there have been no comprehensive environmental accounts for the United States. However, a recent study by the U.S. Environmental Protection Agency suggests that, in contrast to the minerals accounts, environmental accounts might produce large numbers.¹¹ Much methodological work and data gathering are required before a full set of environmental accounts can be developed. Many of the issues were reviewed by a panel of the National Academy of Sciences, whose report was published by the Academy and in the SURVEY OF CURRENT BUSINESS.¹²

Recommendation 8. The U.S. should continue to work toward a comprehensive time-use survey of the U.S. population, which is the single most important data source for understanding nonmarket activity.

The most precious of all our endowments is time, the 24 hours each day that we have to "spend" in work or play or study. Compared with many trivial areas, we know next to nothing about how Americans use their time because, unlike most other major countries, the United States does not collect regular data on time use by the population. This important gap in the Federal statistical system will be filled beginning with the BLS American Time Use Survey (ATUS), scheduled to begin in early 2003 and designed to measure the amount of time people spend doing various activities, such as paid work, childcare, volunteering, commuting, and socializing.¹³

10. "Integrated Economic and Environmental Satellite Accounts," SURVEY (April 1994), pp. 33-49.

11. United States Environmental Protection Agency, *The Benefits and Costs of the Clean Air Act, 1970 to 1990*, Washington, D.C., Office of Air and Radiation/Office of Policy Analysis and Review/Office of Policy, Planning, and Evaluation, April, 1997.

12. See Nordhaus, William D. and Edward Kokkelenberg, eds., *Nature's Numbers: Expanding the National Economic Accounts to Include the Environment: Report of the Panel on Integrated Environmental and Economic Accounting*, Washington, D.C., National Academy Press, 1999; see also the November 1999, February 2000, and March 2000 issues of the SURVEY OF CURRENT BUSINESS for reprints of three chapters from *Nature's Numbers*.

This initiative is in my view the most important and exciting Federal statistical initiative today and deserves careful continuing review and ample fiscal resources.

Better data on time use is critical for many areas in augmented and nonmarket accounting. We need time-use data for building household accounts, for estimating the relative importance of nonmarket investment and consumption, for estimating trends in leisure time, and for understanding the activities of that third of the U.S. population that is retired. Moreover, current measures of work hours used in productivity measures could be improved with focused time-use studies, particularly for the growing share of the workforce (such as professionals for which data hours are relatively unreliable).

One unique feature of time budgets is that they provide a comprehensive budget that includes all activities—nonmarket as well as market. Because time inputs are the most valuable economic input, a time budget will also allow a rough estimate of the relative importance of market and nonmarket activities. While we have extremely sparse historical time-use data for the United States, data on time use in the United Kingdom over the last century indicate that work hours have declined from about half to less than 20 percent of disposable adult hours, although that trend appears to have stabilized in recent years.¹⁴ An important topic is to determine the relative importance of nonmarket and market activities.

Recommendation 9. Estimating intangible and nonmarket investments is a high priority for both nonmarket accounts and for understanding saving and wealth.

A large and growing share of the economy's resources is devoted to investments in education, research, and health. As noted above, because of faulty accounting, their contribution to economic welfare is misclassified, underestimated, and omitted—misclassified because they are largely treated as consumption or intermediate product rather than investment; underestimated because we routinely mismeasure the real output growth of these activities; and omitted because the accounts leave out those activities, particularly important for education, that occur outside the marketplace.

A sector in which augmented accounts may be particularly illuminating is the health-care sector. I will summarize a recent study that asks how standard measures of income would change if they adequately reflected improvements in the health status of the population.¹⁵ Traditional income and product accounts look at the

flows of consumption and income but do not consider the length of life or the quality of the population's health. We might broaden our accounting concepts to include "health income" by correcting income measures for mortality and morbidity changes. Such an approach would take into account improvements in health status along with the implicit prices of improved health. If, for example, an individual would pay 1 percent of market consumption each year to gain an additional life-year, then we use that value to account for improvements in health status.

An example will illustrate the methodology. From 1975 to 1995, the population-weighted average annual mortality rate declined by 2.25 per year per thousand persons. Using standard estimates of the willingness to pay to reduce mortality risk (\$2.66 million per life saved in 1992 prices), this decline in mortality is valued at \$5,985 per person per year over this period. The average per capita consumption over this period was \$14,700 per year. Hence the economic value of improvements of living standards due to reduced mortality is 40 percent of consumption over this period, or about 2 percent per year. I have constructed a preliminary set of estimates of the value of improvements in life expectancy for the period 1900–1995 using actual data on life expectancy, population distribution, and consumption. (These estimates omit changes in morbidity, for which data are relatively poor.) The major result is that the value of improvements in life expectancy over the twentieth century was about as large as the value of the growth in all nonhealth market consumption goods and services put together. Over this period, the value of improved health or health income grew at an average annual rate between 2.2 and 3.0 percent of the value of market consumption whereas consumption grew at a rate of about 2.1 percent. This suggests that a proper accounting of the value of health improvements would produce a major revision to our measured living standards.

Conclusion

The purpose of this discussion has been to give a flavor of the exciting developments and prospects for improving and extending the national economic accounts. There is much fruitful work ahead that will sharpen our estimates, make them more timely and reliable, improve their utility for understanding both business cycles and economic growth, as well as broaden the purview of the national economic accounts.

13. See Diane Herz and Richard M. Devens, Jr., "The American Time-Use Survey," *Industrial Relations*, Volume 40, No. 3, July 2001.

14. See the discussion in William Nordhaus, "New Directions in National Economic Accounting," *American Economic Review*, May 2001, which extends the results from Jesse H. Ausubel and Arnulf Gruebler, "Working Less and Living Longer: Long-term Trends in Working Time and Time Budgets," *Technological Forecasting and Social Change*, 1995, pp. 113–131.

15. Nordhaus, William D. "The Health of Nations: The Contribution of Improved Health to Living Standards," forthcoming in Kevin M. Murphy and Robert H. Topel, eds. *Exceptional Returns: The Economic Value of America's Investment in Medical Research*, University of Chicago Press, available at <<http://www.econ.yale.edu/~nordhaus/homepage>>.