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In 1935, the National Bureau of Economic Research invited a consortium of universities to join with it in establishing a “program of cooperative research” in the area of economic measurement. The Conference on Research in Income and Wealth (CRIW) was founded a year later to provide conceptual support for the establishment of the U.S. National Income and Product Accounts. It was a conference in the basic sense of the word — a group of experts drawn from academia, government statistical agencies, and the business and economic policy community, meeting at regular intervals to confer on issues of importance for the development of the national accounts. While the CRIW has broadened its agenda to include measurement issues beyond the strict confines of the national accounts, the essential personality and objectives of the CRIW have remained unchanged up to the present.

The CRIW has special status at the NBER, thus setting it apart from the Bureau’s regular programs. This status reflects the dual personality of the organization: it is an activity within the NBER, which exercises oversight and provides administrative support, but at the same time, it has a separate membership, steering committee, and its own dedicated funding from the government statistical agencies. Ongoing financial support is derived from the Bureau of the Census, the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Board of Governors of the Federal Reserve System, and Statistics Canada. The executive committee is drawn from these agencies, from academe, and from program directors appointed by the NBER. The CRIW currently has some 300 members. Election to membership in the CRIW does not convey affiliation with the NBER, although there is considerable overlap.

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* Hulten Chairs the Executive Committee of CRIW and is an NBER Research Associate in the Program on Productivity. He is also a Professor of Economics at the University of Maryland. For links to the work discussed in this article, see www.nber.org/CRIW/.
The 1980s and early 1990s were the period in which personal computers, cell phones, video games, ATMs, and then the Internet, became common items of daily life. The disconnect between everyday experience and other aspects of the IT revolution, created a growing importance of these items, as well as changes in the structure of the economy. The main activity of the CRIW is to hold annual conferences on subjects defined by the conference membership. The conference proceedings then appear in the series Studies in Income and Wealth, published by the University of Chicago Press for the NBER. This series now contains nearly 70 volumes. In recent years, the CRIW has joined with NBER's Program on Productivity to hold workshops at the annual Summer Institutes, and this initiative has broadened to include other NBER programs. The conference volumes published over the last decade include: The Economics of New Goods (1997), Geography and Ownership as Bases for Economic Accounting (1998), Labor Statistics Measurement Issues (1998), International and Interarea Comparisons of Income, Output, and Prices (1999), New Developments in Productivity Analysis (2001), Medical Care Output and Productivity (2001), and Scanner Data and Price Indexes (2003). The last three years have been particularly busy, with five regular CRIW conferences whose volumes are not yet published: Measuring Capital in the New Economy (2002), Hard-to-Measure Goods and Services: Essays in Memory of Zvi Griliches (2003), New Architecture for the U.S. National Accounts (2004), Price Index Concepts and Measurement (2004), and Producer Dynamics: New Evidence from Micro Data (2005). In addition, the CRIW has collaborated in three other conferences and five workshops. A listing of recent conferences and programs and workshops is available on the CRIW web page (www.nber.org/criw/), along with a list of volumes in the Studies in Income and Wealth series.

This list of recent conference papers is too long to describe fully in this brief report. However, there are several cross-cutting themes: the importance of the revolution in information technology; the emergence of new goods and services whose quality differences are important and changing; and the globalization of economic activity. These dynamic issues provide a formidable challenge to economic measurement, since the national accounts are not a static structure, but rather one that must evolve continuously to reflect changes in the structure of the economy.

New Goods

The 1980s and early 1990s were the period in which personal computers, cell phones, video games, ATMs, and then the Internet, became common items of daily life. The growing importance of these items, as well as other aspects of the IT revolution, created a disconnect between everyday experience and
macroeconomic statistics, prompting Robert Solow to remark in 1987 that, “we see the computer revolution everywhere except in the statistics.” Federal Reserve Board Chairman Alan Greenspan also noted this disconnect, and suggested that official statistics fail to capture the true dynamism of the economy. He observed that official statistics implied that productivity in the service sector was virtually non-existent, despite the widespread adoption of cost-saving processes and new products based on the IT revolution. He also told the Senate Finance Committee in 1995 that he thought that the growth rate of the consumer price index was biased upward by between one-half to one and a half percentage points per year because of mismeasurement. The Boskin Commission, impaneled to investigate the matter, put the upward bias at around one percent per year, and attributed about half to the failure of the CPI to accurately reflect product innovation.

The influence of this critique is evident in the CRIW conference, The Economics of New Goods. William Nordhaus, writing in this volume, traces the history of lighting and argues that, “by the very nature of their construction, price indexes miss the most important technological revolutions in history (page 54).” Writing in the same volume, Jerry Hausman points out that the CPI did not include cellular telephones in the CPI market basket until some 10 years after their introduction into the market place. He proposes, in that paper, a procedure for handling new goods based on the Hicksian reservation price. However, measurement practice has tended to adopt the hedonic price model as the appropriate framework. Price hedonics was used by the Bureau of Economic Analysis in the mid 1980s to adjust prices and quantities in the national accounts for the rapid increase in computing power, and has become the focus of attention at the BLS as a means of improving the CPI program. The hedonic price model has been given a great deal of attention at many recent CRIW conferences, including Hard-to-Measure Goods and Services: Essays in Memory of Zvi Griliches and Price Index Concepts and Measurement.

Measuring Capital

Technological innovation also causes equally serious problems for the measurement of capital, particularly for the intangible “knowledge” assets like accumulated research and development and human capital. Conventional accounting practice treats R and D expenditures as an intermediate expense that is used up in the same period in which it was produced, thereby ignoring the large body of research that finds a large rate of return to R and D as a capital investment. This issue was taken up in the 2003 conference Measuring Capital in the New Economy. The paper by Corrado, Hulten, and Sichel presented at this conference explores the consequences for accounting practice of counting as investment a broad list of intangibles – R and D, copyrights, films, computerized databases, development of improved organizational structures, and brand equity. Business investment in intangibles was found to be as large as the spending on tangible capital – as much as $1 trillion in recent years – and a significant portion of this amount is excluded from the existing investment figures in the NIPA.

In subsequent work reported at a CRIW/Productivity Program workshop at last year’s NBER Summer Institute, a follow-on study found that the rate of growth of measured labor productivity in the non-farm business sector is strongly affected by the capitalization of this list of intangible assets, and that the proportion of growth attributed to capital formation is the dominant source of growth when intangible assets are included in the analysis.

This practice of excluding intangibles is beginning to change at the macro level, with BEA’s decision to capitalize software expenditures and the planned capitalization of R and D expenditures in a satellite account to the main NIPA. This issue is taken up in the paper by Fraumeni and Okubo, “R&D in the National Income and Product Accounts: A First Look at Its Effect on GDP,” in Measuring Capital in the New Economy. The importance of firm-specific investments in human capital is discussed in “The Relation of Human Capital, Productivity, and Market Value: Building Up from Micro Evidence” by Abowd, Haltiwanger, Jarmin, Lane, Lengermann, McCue, McKinney, and Sandusky.

National Income Accounts

New and future developments at the BEA are also discussed in the volume New Architecture for the U.S. National Accounts. The paper by Landefeld and Jorgenson in this volume sets out a road map for the evolution of the U.S. NIPA in “Blueprint for an Expanded and Integrated Set of Accounts for the United States.” In a sense, this paper takes up the unfinished business left over from the early days of the national accounting movement. A perusal of the early volumes of the Studies in Income and Wealth reveals that the original intent of the “founding fathers” was to develop a fully integrated income and wealth account, with allowance for non-market production. This vision was not realized when the national accounts were first published in the late 1940s. These accounts emerged with a distinctly Keynesian personality that emphasized short-run market flows, without a balance sheet, a non-market production, or a true production account that allowed for capital services as a productive input. Following the paper by Landefeld and Jorgenson, the other contributions in New Architecture for the U.S. National Accounts take up these various issues. The issues involved in developing a national balance sheet and linking the BEA investment and capital stock estimates to the FRB’s wealth and flow-of-funds estimates are described in “Integrated Macroeconomic Accounts for the United States: Draft SNA_U.S.A,” by Teplin, Antoniewicz, McIntosh, Palmbo, Solomon, Mead, Moses, and Moulton. Non-market accounting is discussed in “A Framework for Non-Market Accounting,” Abraham and Mackie, and “Principles of National Accounting for Non-Market Accounts,” by Nordhaus. My paper, “Architecture of Capital Accounting: Basic Design Principles” deals with the problem of developing a production account with capital service flows, linked to the corresponding stocks of capital and
wealth. This is also taken up in the paper by Harper, Powers, Fraumeni, and Yuskavage, “An Integrated BEA/BLS Production Account: A First Step and Theoretical Considerations.”

**Service Sector Output**

The problems associated with the measurement of service sector output represent another item of “old business” on the CRIW agenda. This sector has grown steadily since the first publication of the U.S. national accounts, increasing from 36 percent of GDP in 1947 to 56 percent by 1997. The failure to measure the output of services has been advanced as an explanation of the productivity slowdown of the mid-1970s to the mid-1990s, and was given added salience by Greenspan’s skepticism about the slow growth of productivity in a sector in which the IT revolution was so apparently important. The pick up in productivity after 1995 in the service sectors and its association with IT investments focused even more attention on the measurement problem. It is therefore not surprising, given this history, that the CRIW has devoted a great deal of attention to the subject, with the 1969 conference *Production and Productivity in the Service Industries*, the 1992 *Output Measurement in the Service Sectors*, and more recently, *Medical Care Output and Productivity* (2001), *Scanner Data and Price Indexes* (2003), and the yet-to-be published proceedings *Hard-to-Measure Goods and Services: Essays in Memory of Zvi Griliches* (2003), and *Price Index Concepts and Measurement*. Other CRIW conferences and workshops had papers on banking output, insurance, and educational output.

**Additional Work**

The topics reviewed thus far are by no means an exhaustive list of the issues of importance to the CRIW. Strengthening the linkage between the aggregate data of the NIPA and its microfoundations is another priority, reflected in the most recent CRIW conference, *Producer Dynamics: New Evidence from Micro Data*. The problems posed by the globalization of economic activity present yet another challenge for economic measurement. What does it mean to have “national” accounts when capital and technology (and now labor as well) flow ever more freely across national boundaries? Various aspects of this question are examined in the CRIW volumes *International and Interarea Comparisons of Income, Output, and Prices* and *Geography and Ownership as Bases for Economic Accounting*, and will likely be the subject of the next CRIW conference in 2006. These problems and others will keep the CRIW as busy in the next decade as it has been in the past.

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