Facilitating Innovation in the Federal Statistical System: Summary of a Workshop

ISBN
978-0-309-21461-2

80 pages
6 x 9
PAPERBACK (2011)

Hermann Habermann, Rapporteur; National Research Council

FACILITATING INNOVATION IN THE FEDERAL STATISTICAL SYSTEM

SUMMARY OF A WORKSHOP

Hermann Habermann, *Rapporteur*

Committee on National Statistics

Division of Behavioral and Social Sciences and Education

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

THE NATIONAL ACADEMIES PRESS
Washington, D.C.
www.nap.edu

NATIONAL ACADEMIES PRESS 500 Fifth Street, N.W. Washington, D.C. 20001

NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the committee responsible for the report were chosen for their special competences and with regard for appropriate balance.

This study was supported by a consortium of federal agencies through a grant from the National Science Foundation (award number SES-0453930). Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the organizations or agencies that provided support for this project.

International Standard Book Number-13: 978-0-309-21461-2
International Standard Book Number-10: 0-309-21461-0

Additional copies of this report are available from the National Academies Press, 500 Fifth Street, N.W., Lockbox 285, Washington, D.C. 20055; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area); Internet, http://www.nap.edu.

Printed in the United States of America

Suggested citation: National Research Council. (2011). *Facilitating Innovation in the Federal Statistical System: Summary of a Workshop.* Hermann Habermann, rapporteur. Committee on National Statistics, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, upon its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

www.national-academies.org

STEERING COMMITTEE FOR THE WORKSHOP ON FACILITATING INNOVATION IN THE FEDERAL STATISTICAL SYSTEM

THOMAS LOUIS (*Chair*), Department of Biostatistics, Johns Hopkins University
LAWRENCE BROWN, Department of Statistics, The Wharton School, University of Pennsylvania
EMERSON J. ELLIOTT, Former Commissioner, National Center for Education Statistics and Director, Special Projects, National Council for Accreditation of Teachers Education, Washington, DC
IVAN FELLEGI, Director (emeritus), Statistics Canada
ROBERT GROVES, Director, U.S. Census Bureau
SALLY C. MORTON, Department of Biostatistics, University of Pittsburgh
EDWARD SONDIK, Director, National Center for Health Statistics, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services

HERMANN HABERMANN, *Study Director*
BRIDGET EDMONDS, *Administrative Assistant*

COMMITTEE ON NATIONAL STATISTICS
2010-2011

LAWRENCE BROWN (*Chair*), Department of Statistics, The Wharton School, University of Pennsylvania
JOHN ABOWD, School of Industrial and Labor Relations, Cornell University
ALICA CARRIQUIRY, Department of Statistics, Iowa State University
WILLIAM DuMOUCHEL, Oracle Corporation, Waltham, Massachusetts
V. JOSEPH HOTZ, Department of Economics, Duke University
MICHAEL HOUT, Department of Sociology and Survey Research Center, University of California, Berkeley
KAREN KAFADAR, Department of Statistics, Indiana University
SALLIE KELLER, Science and Technology Policy Institute, Washington, DC
LISA LYNCH, Heller School for Social Policy and Management, Brandeis University
SALLY C. MORTON, Department of Biostatistics, University of Pittsburgh
JOSEPH NEWHOUSE, Division of Health Policy Research and Education, Harvard University
SAMUEL H. PRESTON, Population Studies Center, University of Pennsylvania
HAL STERN, Donald Bren School of Information and Computer Sciences, University of California, Irvine
ROGER TOURANGEAU, Joint Program in Survey Methodology, University of Maryland, and Survey Research Center, University of Michigan
ALAN ZASLAVSKY, Department of Health Care Policy, Harvard Medical School

CONSTANCE F. CITRO, *Director*

Acknowledgments

This report is a summary of the June 29, 2010, workshop on facilitating innovation in the federal statistical system. The workshop was convened by the Committee on National Statistics (CNSTAT) of the Division of Behavioral and Social Sciences and Education (DBASSE) of the National Research Council (NRC). Support for the workshop was provided by a consortium of federal agencies through a grant from the National Science Foundation.

As chair of the steering committee and rapporteur for the workshop summary, we wish to thank the members of the committee for their helpful guidance and leadership in planning the workshop and moderating the sessions.

We acknowledge with appreciation the many people who participated in the workshop and contributed to its success, particularly Katherine Wallman, chief statistician of the United States at the Office of Management and Budget, who helped us think through the logic of the sessions. We thank Robert Parker for preparing a background paper for the workshop and everyone who spoke for their stimulating and insightful comments and discussion.

We thank staff of CNSTAT and DBASSE, particularly Bridget Edmonds who was responsible for the administration of the workshop. This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Report Review Committee of the NRC. The purpose of this independent review is to provide candid and critical

comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report: Emerson J. Elliott, Director, Special Projects, National Council for Accreditation of Teacher Education; Brian Harris-Kojetin, Statistical and Science Policy Office, Office of Information and Regulatory Affairs, Office of Management and Budget; Thomas B. Jabine, retired, Silver Spring, Maryland; J. Steven Landefeld, Director, Bureau of Economic Analysis, U.S. Department of Commerce; and Victoria Velkoff, Assistant Division Chief, Population Estimates and Projections, Population Division, U.S. Census Bureau.

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse nor did they see the final draft of the report before its release. The review of this report was overseen by John E. Rolph, Professor Emeritus of Statistics, Department of Industrial Operations and Management, Marshall School of Business, University of Southern California. Appointed by the NRC's Report Review Committee, he was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the rapporteur and the institution.

Thomas Louis, *Chair*
Hermann Habermann, *Rapporteur*

Contents

1

Introduction

A healthy and vigorous program for innovation is fundamental for the continued success of any large-scale organization, including the statistical agencies of the U.S. government.[1] The concept of innovation for statistical agencies is broad. It includes traditional subjects of innovation, such as improvements in survey design and data collection procedures, including editing and imputation for missing and incorrect data in surveys and administrative records. And it also includes those less usually considered, such as questions about the usefulness of federal statistics to policy officials and whether new approaches to bridge the interface between users and statisticians are required.

Policy makers often have a different time horizon for needing information (a few days, a few months, perhaps as long as a year) from that of ongoing statistical series, many of which provide information on a long time frame. For policy makers, there may be a tradeoff between the timeliness of information and its usefulness. If they can obtain the approximate answer to their question in a timely manner, they may find it sufficient for their needs, rather than a more accurate answer months or even years later.

Designing and fielding a survey and producing results often take years. Less traditional types of information-gathering modalities can reduce this time frame dramatically, although without the generaliz-

[1]See National Research Council (2009), especially pp. 26-31. This document also describes the decentralized U.S. statistical system (see, particularly, Appendix A).

ability and properties of traditional survey methods. For example, the National Academy of Public Administration (NAPA) has partnered with government agencies to conduct more than a dozen online dialogues—web-based discussion forums in which stakeholders and the public can log on, discuss ideas for addressing one or several related issues, and express their perspectives and priorities for government action.[2] One of those dialogues was conducted on health information technology and privacy. During the week-long online discussion, the dialogue received more than 4,000 visits from across the country, generating hundreds of ideas and comments. It provided what policy officials deemed was sufficient information in a short amount of time.

These types of information collections give rise to several questions. Should federal statistical agencies play a role in these types of information gathering, and, if so, how? If the federal statistical system does not become an active participant in such approaches, is it in danger of becoming irrelevant? From the opposite perspective, is there a danger in straying too far in the direction of approximate answers and away from the traditional rigor of statistically valid information collections? Given these questions and the evolving ways of gathering information, what kinds and extent of innovation are needed for the federal statistical system to be able to play an appropriate role in meeting the needs of the public and policy makers for high-quality, timely, and relevant statistics to address new and changing social issues and questions?

ORIGIN AND SCOPE OF THE WORKSHOP

On May 8, 2009, the Committee on National Statistics of the National Research Council and the American Academy of Political and Social Science jointly sponsored a symposium called "The Federal Statistical System: Recognizing Its Contributions, Moving It Forward," in Washington, DC. One of the topics considered at that symposium was the health of innovation in the federal statistical system.[3] A consequence of the symposium was an agreement by the Committee on National Statistics to hold a workshop on the future of innovation in the federal statistical system. That workshop was held on June 29, 2010.

The original statement of task for the workshop focused on three challenges to the statistical system: (1) the obstacles to innovative, focused research and development initiatives that could make statistical programs more cost-effective; (2) a gap between emerging data visualization and

[2]See http://www.napawash.org/continuing-programs/national-dialogues/ [February 2011].

[3]For a report on the symposium, see Habermann (2010b).

communications technologies and the ability of statistical agencies to understand and capitalize on these developments for their data dissemination programs; and (3) the maturation of the information technology (IT) discipline and the difficulties confronting individual agencies in keeping current with best practice in IT regarding data collection, processing, estimation, and dissemination, all the while protecting data confidentiality.

It was envisioned that the workshop would include invited presentations and discussions to consider these challenges and the potential to address them. However, the steering committee decided that it would not be possible to consider all three topics in a one-day workshop. It was also decided that the time at the workshop would be devoted solely to discussions, without any presentations, although there would be background papers.

Thus, the workshop proceeded under the following task statement:

> The workshop would address (1) the need for innovation in the federal statistical system; (2) the scope of the innovation problem and barriers to innovation; and (3) possible approaches to facilitating innovation in the federal statistical system.

A major purpose of the workshop would be to generate a wide spectrum of views on the state of innovation in the federal statistical system and possible ways to facilitate it.

The workshop agenda appears in Appendix A. The workshop attendees, who included representatives from the federal statistical system and the academic and private sectors, are listed in Appendix B. Two papers were prepared specifically for the workshop: "Challenges to the Federal Statistical System to Continue to Provide Data Relevant to Policy Issues" by Robert P. Parker (2010) and "Barriers to Innovation and Possible Remedies" by Hermann Habermann (2010a). In addition, a previously published paper by Don Dillman (1996), "Why Innovation Is Difficult in Government Surveys," was provided as background material. Thomas Louis (Johns Hopkins School of Public Health), chair of the workshop steering committee, suggested including the Dillman paper since its main points are as relevant in 2010 as they were in 1996.

REPORT AND WORKSHOP ORGANIZATION

This report is a descriptive summary of what transpired at the workshop. It is therefore limited to the views and opinions of the workshop participants. However, it does not strictly follow the agenda of the workshop, which had four sessions. Instead, it is organized around the themes of the discussions, which migrated across the four sessions. For example,

comments on the barriers to innovation were made in Session I, and comments on barriers and remedies were made in Session II. Moreover, there was no clear distinction between the need for innovation and the scope of innovation.

The introductory remarks that opened the workshop and a list of workshop highlights are summarized below. Chapters 2-5 cover, respectively, the scope and importance of innovation in federal statistics, barriers to innovation in federal statistics, possible remedies, and next steps.

INTRODUCTORY REMARKS

Introductory comments were made by Thomas Louis, Constance Citro, and Katherine Wallman. In his introductory comments, Louis noted the impressive history of innovation in the federal statistical system, yet he stressed that it is time to consider how to move forward. He referred to the background paper by Habermann, which provides some examples of outstanding innovation and research accomplishments of the federal statistical system.

As discussed in that paper, the terms "research" and "innovation" are both used in this summary. They are related to one another, but complementary. "Research" is used, as in any field, in reference to systematic inquiry to discover facts or frame theories, and "innovation" is oriented to applications—that is, to design, invention, or development that yields products or services creating new value. For innovation to occur, the fruits of research must be applied to existing processes. Research may not always be necessary for innovation to occur, and even when new research results are produced, they may not be sufficient for innovation. Furthermore, the necessary research need not come from the federal government. The federal statistical system, however, must have the vision and the commitment for use of research to drive innovation. In discussing innovation, then, one is of necessity considering a complex process, usually involving research, whose end result is a change in existing processes of a statistical agency.

Louis said that among the most prominent accomplishments of the federal statistical system is the work of Morris Hansen and his colleagues at the Census Bureau. Although such seminal work occurs only infrequently, the innovation environment in the federal statistical system is still rich. Some examples include work on the seasonal adjustment of time-series data (such as unemployment rates); models for small-area estimates of poverty; fully outfitted, mobile medical testing facilities for the National Health and Nutrition Examination Survey; and the development of a generalized and integrated data warehouse by the U.S. Department of Agriculture to provide easy access to historical survey and census data

from farmers and ranchers. These innovations have often been accomplished by, or in collaboration with, academic or contractor institutions.

The federal statistical system continues to be aware of the need to foster an environment that supports and contributes to innovation, Louis said. For example, the Interagency Committee on Statistical Policy, chaired by the U.S. Office of Management and Budget (OMB), has created a subcommittee on innovation, which has worked in such areas as sampling methods and dissemination procedures and engaged in discussions with the academic community on the need for statisticians in the federal government.

However, although the environment for innovation is rich and the research accomplishments of the federal system are formidable, Louis echoed the point in Habermann's paper that the demands of the nation require ever more innovation. New technologies have opened doors that did not exist even 10 years ago. Users are examining the cost and time for traditional survey approaches and asking if quicker, cheaper approaches with less accuracy are acceptable.

Robert Groves (U.S. Census Bureau) noted, for example, that the federal statistical system would not be able to continue its current business model of surveys with its current methods much longer because costs are escalating beyond the tolerance of the taxpayer to meet these costs. Constance Citro (Committee on National Statistics) pointed out that, although it is rare indeed for businesses to reinvent themselves, and even rarer for government agencies to do so, the data needs and the challenges to provide for such needs are growing. Consequently, the federal statistical system needs to assess how it is going to meet the demands and challenges of the future: indeed, that issue is the purpose of the workshop.

Louis also introduced the theme of competition between the operational demands of an agency's day-to-day activities and the need to refocus these activities. He noted that innovation for tomorrow and beyond is often bumped by operational pressures and that it is important to keep in sight the demands of the future—no matter how pressing today's responsibilities. In order to be able to meet the ever-changing and increasing demands discussed above, Louis said that it is critical to have the right culture, to have the right people in place, and to have a reward system that encourages risk and innovation. With respect to the inherent risk of trying to innovate, Citro said that the federal statistical system should embrace the process of innovation even though some ideas will be failures.

With respect to having the right people and reward system in place, Katherine Wallman (U.S. Office of Management and Budget) asked what the system would have to do in order to recruit the people who will be needed. She also introduced the themes of confidentiality, burden, and

OMB's role in the redesign of household surveys. Although preserving the confidentiality of individually identifiable data is of paramount importance, innovation is needed to provide more data to the public, including data on small areas. The survey system depends on the willingness of potential respondents to participate. Work is needed both to encourage their participation and to reduce the burden on them. The traditional "stovepipe" approach to surveys (with agencies independently designing surveys without considering the data requirements of other agencies), as Groves also mentioned, may not be adequate for the future. Wallman noted that OMB is engaged in initiatives to understand how surveys can best be integrated and their costs reduced.

At least three major forces are currently affecting the federal statistical system. The first is the ever more difficult environment that data collection organizations face. For example, because of increasing resistance to survey participation, the Census Bureau has said it would be a significant accomplishment if the mail return rate for the 2010 census equaled that of 2000. The second is the need to respond ever more quickly to the needs of the business community, the public, and the political community. The third is the gap between emerging data visualization and communications technologies and the ability of the statistical agencies to incorporate and capitalize on these developments. Exacerbating these factors is the absence of a central focal point or agency with statistical research as its mission. Research now is scattered among the statistical agencies—and few have the critical mass of research statisticians that may be needed to deal with these factors.

WORKSHOP HIGHLIGHTS

As intended, the workshop was a forum for the free exchange of ideas—primarily on barriers to innovation, possible remedies, and next steps. There were no attempts to arrive at a consensus, nor were any conclusions drawn. To provide some structure, several of the participants presented their views of some recurring themes, and these are presented here.

- Some of the most creative people in an organization are often considered misfits. In fact, the ideas developed by these "creative misfits" are often the most innovative.
- The federal statistical system is a mature system, the field of statistics has become very specialized, and future innovation could require major initiatives. For example, administrative records show great promise and are widely believed to be critical for future

data collections. However, without a major effort, their use seems always to be a year away.

- Sometimes the problem in fostering innovation is a lack of ideas, and sometimes it is the inability to implement new ideas.
- Competition among federal statistical agencies can be an impediment to innovation, so collaboration is critical.
- A key to innovation is the willingness of the senior managers of statistical agencies to provide the necessary leadership and to follow through on the ideas discussed at the workshop.
- The Office of Management and Budget is responsible for providing leadership in eliminating bureaucratic barriers in contracting and recruitment.
- A system-wide marketing plan to academic institutions could stimulate academic work on federal statistical problems.
- Case studies of best practices could be useful in providing guidance on how to stimulate innovation.
- Communication within and between agencies could be improved.
- Progress in innovation needs to be measured periodically, perhaps through developing and disseminating annual or biannual reports on key innovations and research.
- The federal statistical system could develop a joint federal statistics research agenda.
- The Interagency Committee on Statistical Policy could take the lead in developing a marketing program with academic institutions and in establishing a culture of innovation in the federal statistical system.
- It is important for at least a subset of the agencies to work on specific innovation projects while discussion proceeds on the larger issue of innovation in the federal statistical system.
- The federal statistical system could consider a cross-cutting centralized research approach, although with each agency having the ability to retain local creativity.
- Although there are many opportunities to encourage innovation, it is not clear that the federal statistical system has the necessary will to engage them.

2

Scope and Importance of Innovation

This chapter, reporting largely on the first workshop session, addresses the question: Why is innovation in the federal statistical system needed? The main arguments of the background paper by Robert Parker (2010) are summarized first, followed by relevant points from the background paper by Hermann Habermann (2010a), and then by participants' comments. As noted in Chapter 1, many of the participants also commented on barriers and possible remedies; those comments are summarized in Chapters 3 and 4, respectively.

CHALLENGES TO THE FEDERAL STATISTICAL SYSTEM

In his paper, Parker focuses on the importance of continued innovation by the system. He discusses several cases in which users are asking for more relevant policy data and identifies some of the challenges in providing these data. Parker notes that in looking ahead there are risks and challenges that will require the system to change. The identification of such challenges is not new, as evidenced by statements made over more than a decade:

> The challenge for the 21st century is to build on to the remarkable statistical system developed in the 20th century. . . . We need to take advantage of new methods of information collection and dissemination and devote adequate resources to improve the quality, coverage and timeliness of federal statistical programs. . . . Federal statistics are not a "hot button" issue; politicians do not run for office on a strong plank for improving them (Knapp, 1996).

* * *

> We are in the early stage of a technological revolution that will dramatically increase the demand for statistics and their use in policy debates, as well as in many other areas of society. This revolution is created by the advent of the Internet and the World Wide Web. . . . I believe that three principal challenges must be faced if the system is to successfully meet the demands placed on it by this technological revolution. The three challenges are relevance, validity, and timeliness (Bradburn, 1999).

* * *

> Many new problems are facing the statistical agencies, and it will take an enormous effort to solve them. Indeed, the agencies are fully aware and understand there is a need for innovative thinking (Spar, 2009).

One of the essential functions of any statistical agency is to produce relevant data, a requirement recognized by the Committee on National Statistics in a volume that lays out the principles that determine an effective statistical agency (National Research Council, 2009). The first of these principles is that "a federal statistical agency must be in a position to provide objective information that is relevant to issues of public policy." One of the most important reasons for innovation, then, is ensuring the ability to provide users with policy-relevant data. In his paper, Parker offers four examples of areas in economic statistics in which innovation is needed to provide relevant data for major policy issues and that illustrate the need for innovation by the federal statistical community:

1. data on intangible assets (based on work by the U.S. Department of Commerce);
2. measures of economic welfare (see Stiglitz, Sen, and Fitoussi, 2009);
3. indicators related to the most recent recession and recovery (see Advisory Committee on Measuring Innovation in the 21st Century Economy, 2008; Blank, 2010; Krueger, 2010); and
4. measures of international economic activity.

These areas are all critically important to the nation, as has been noted by others. For example, the problems involved in the measurement of economic progress and welfare and, more specifically, the challenge of defining and measuring gross domestic product were raised in a recent *New York Times Magazine* article (Gertner, 2010) on the utility of gross domestic product (GDP). Because of their importance, these examples, as developed by Parker, are described in more detail below.

Data on Intangible Assets

The need for innovation is not unique to the federal statistical system. Innovation is essential for the business community if the United States is to be economically competitive in the world. Recognizing this, in 2008 the Commerce Department's Advisory Committee on Measuring Innovation in the 21st Century Economy issued a report calling for new measures of innovation to be prepared by the Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), and the National Science Foundation (NSF). For its work, the committee adopted the following definition of innovation (Advisory Committee on Measuring Innovation in the 21st Century Economy, 2008, p. 3): "The design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the firm." The committee, then, was concerned with developing new measures of innovation in the business community that would result in improved returns for the business and added value for the customer and be more cost-effective. It is worth noting that if this definition were to be applied to the federal statistical system, statistical agencies would supply more relevant, timely, and reliable data and be more cost-effective in doing so.

Carl Schramm, chair of the advisory committee and president and chief executive officer of the Ewing Marion Kauffman Foundation, described the need for new measures of innovation as "central to understanding the economy as it evolves and responds to growing world competition. . . . Improvements to our measurement of innovation will help to ensure continued economic strength" (Parker, 2010). The measures the advisory committee called for include a comprehensive accounting of the effect of high-tech goods and services on growth and productivity, as well as new data on research and development and innovation-related inputs.[1] BEA reported that there are difficult conceptual issues to be resolved in order to collect new data on such intangible investments (Aizcorbe, Moylan, and Robbins, 2009). In addition, the collection of these data may be difficult because they may not be available from the usual business accounting records. Furthermore, it may be that firms can provide such estimates only at the enterprise level, yet the data are needed at the establishment level. Thus, statistical agencies will need to develop new methods to distribute firm-level data to the establishment level for a variety of types of intangible investments.

[1]The annual Business R&D and Innovation Survey, just released in 2009 by the U.S. Census Bureau for the National Center for Science and Engineering Statistics, is intended to expand the available data on R&D and innovation. See http://www.nsf.gov/statistics/srvyindustry/ [June 2011].

GDP and Measurement of Economic Welfare and Prosperity

The *Report by the Commission on the Measurement of Economic Performance and Social Progress*, known as the Sarkozy report, argued that there is no sufficient statistic for judging the health of the economy (Stiglitz, Sen, and Fitoussi, 2009).[2] Joseph Stiglitz, one of the authors of the report, said that policy makers "focused too much attention on GDP as an indicator of economic success, and there was no indication in the GDP figures that a crisis was brewing. Although GDP is the best-developed broad measure of economic performance, it can provide a misleading gauge of the quality of life or sustainability of an economy" (Parker, 2010).

Although not in specific response to the Sarkozy report, BEA in 2010 published an article related to the report and some of its recommendations (Landefeld et al., 2010). The article reported that BEA had looked at changing its presentation of the various measures in the GDP accounts and announced that it plans to publish additional detail based on the current accounts (p. 12):

> This article explores each of these issues and relates them to the need for expanded or supplementary measures for the national accounts, highlighting what such estimates might reveal relative to the conventional statistics presented by GDP and other aggregate statistics from the accounts. In particular, it explores how the accounts might be extended to provide new measures of (1) the distribution of growth in income across households, other sectors, and regions and (2) the sustainability of trends in saving, investment, asset prices, and other key variables important to understanding business cycles and the sources of economic growth.

With regard to various alternative indicators, such as the genuine progress indicator, the world development indicators, and the Index of Sustainable Economic Welfare, BEA reported that "while these efforts have been much discussed and debated, there has never been sufficient consensus on the difficult issues involved to produce a common set of concepts or methods or a widely accepted regular set of estimates that were used for analytical or policy purposes" (Landefeld et al., 2010).

This article was followed by the *New York Times Magazine* article by Gertner (2010), which noted:

> For decades, academics and gadflies have been critical of the measure [GDP], suggesting that it is an inaccurate and misleading gauge of prosperity. What has changed more recently is that G.D.P. has been actively challenged by a variety of world leaders, especially in Europe, as well as by a number of international groups, like the Organization for Economic

[2]The commission was created in 2008 by French President Sarkozy to identify the limits of GDP as an indicator of economic performance and social progress.

> Cooperation and Development. The G.D.P., according to arguments I heard from economists as far afield as Italy, France and Canada, has not only failed to capture the well-being of a 21st-century society but has also skewed global political objectives toward the single-minded pursuit of economic growth. "The economists messed everything up," Alex Michalos, a former chancellor at the University of Northern British Columbia, told me recently when I was in Toronto to hear his presentation on the Canadian Index of Well-Being. The index is making its debut this year as a counterweight to the monolithic gross domestic product numbers. "The main barrier to getting progress has been that statistical agencies around the world are run by economists and statisticians," Michalos said. "And they are not people who are comfortable with human beings." The fundamental national measure they employ, he added, tells us a good deal about the economy but almost nothing about the specific things in our lives that really matter.

Parker suggested that part of the reason statistical agencies have not embraced alternative concepts is their desire that components of, for example, the index of well-being, be measures that (1) have a theoretical relationship to the concept being measured; (2) are reliable; and (3) for the weights used to combine them, are based on some reasonable calculation. Consequently, the Canadian Index of Well-Being (CIW) is not produced by Statistics Canada but by a group of nonprofit foundations. Even if the "domains" covered by the index are reasonable, many economists and statisticians do not believe there is sufficient theoretical foundation to assign the appropriate weights to the domains. This problem of calculating weights also applies to other measures cited by Gertner, such as the planned Key National Indicators System[3] and the Human Development Index.[4] These factors do not mean that the measures do not have value in assessing progress; it does mean that more conceptual and theoretical work needs to be done before they will be produced by government statistical agencies.

Nevertheless, the measures discussed in the Gertner article do pose a challenge for statistical agencies. Should they attempt to develop statistically valid measures of prosperity in addition to the conventional measures? BEA has expressed its reasons for not doing so, but other agencies may choose to look at more narrowly defined welfare measures consistent with their areas of responsibility, such as health, education, and the envi-

[3]For a detailed report on the indicators project, see U.S. Government Accountability Office (2004, 2011).

[4]See http://hdr.undp.org/en/statistics/hdi/ [June 2011].

ronment.[5] The challenge of providing measures of welfare and prosperity is that the current methods are not those usually used by statistical agencies. This difference raises the question of whether the agencies should avoid those measures or perhaps limit their participation to just collecting input series. But even the latter step has significant risks, as some of the items would require the collection of opinion-type data, now usually collected only by polling firms. To deal with these problems Parker suggests "that agencies and related professional associations may need to develop guidelines on what the agencies should and should not collect" (p. 6).

Indicators of Recession and Recovery

In October 2009, Alan Krueger, then the chief economist in the U.S. Department of the Treasury, addressed the annual meeting of the National Association of Business Economists (NABE) on how the weaknesses in the financial and regulatory systems also "revealed an important weakness . . . in data and statistics that policymakers and others use to assess the performance of the economy to predict its future prospects, and to evaluate the effectiveness of public policies" (Parker, 2010). Krueger, who previously headed the Princeton Data Improvement Initiative, which evaluated the reliability of the government statistical agencies' main economic indicators, included as weaknesses a lack of timeliness, insufficient detail, and lack of relevance of certain key statistics as well as data gaps. More recently, Commerce Department Undersecretary Rebecca Blank addressed an NABE seminar on federal statistics on the same topic. The rest of this section summarizes their major concerns, as laid out by Parker.

Krueger and Blank both noted that most key data series are released with a lag, making it difficult to monitor existing or proposed stabilization policies. For example, the Federal Reserve Board's flow of funds accounts provides information on sector balance sheets and related transactions, but they are only produced quarterly and with a 3-month lag. Similarly, its Survey of Consumer Finances provides a detailed look at the state of households' financial health only once every three years, with well more than a year's lag between the last year of the survey and the release date. BEA's GDP data by industry are produced annually with a 5-month lag. Krueger and Blank said that more timely data on how different industries were affected by the recent recession would have been valuable in assess-

[5]It also should be noted that in calculating GDP, BEA follows international guidelines, as do almost all other countries. Thus, changes to GDP would require agreement at the international level.

ing various policy options.[6] Also, more timely Census Bureau longitudinal firm-level data would enable policy makers to study births and deaths over the economic cycle and to determine which firms contract (or grow) more than others in a time of economic change. Likewise, more timely longitudinal household-level data would show what happens to families when one member experiences unemployment.

Krueger and Blank also found that there is an almost complete lack of information for a number of key economic variables. They pointed to little or no data on investment in intangibles; almost no data relating to loan originations (because the measures on characteristics of mortgages collected by the Mortgage Bankers Association are incomplete); no data on alternative sources and characteristics of bank lending; and few data to determine why the financial collapse created a credit crisis that led to the recession. They also noted that there is limited information about the amount saved from mortgage refinancing activity, which limits the ability to estimate the aggregate economic effects of refinancing. Krueger suggested that one possible solution to filling these and related data gaps would be to establish some sort of "rapid response" data-gathering capacity in the statistical system that could be tailored to answer specific, one-shot questions, such as changes in consumption by households.

Krueger and Blank also noted that the available GDP accounts provide information as to whether the economy is contracting or expanding, but not about the sustainability of growth or about the distribution of income; neither do the accounts provide information as to whether resources are being used to maximize well-being. For example, neither the negative effects of pollution nor the positive effects of leisure time are valued in GDP. Because of these lacks, some analysts studying the future health of the economy also look at other statistics, such as the poverty rate, data on consumer wealth or the state of the environment, and data from household time-use surveys. In supporting his concerns about reliance on GDP, Krueger also referred to the findings of the Sarkozy report (Stiglitz, Sen, and Fitoussi, 2009), discussed above.

Some of the issues raised by Krueger and Blank involve data currently collected by the private sector or by financial regulatory agencies. Improvements might be made by statistical agencies partnering with these organizations. However, the preparation of sampling frames by statistical agencies may require additional detail on products of large financial institutions and dealing with new types of organizations. As with new data on innovation, some of these data will be available only at the enterprise level, so the agencies would need to develop new methods

[6]A proposal to fund quarterly industry GDP was included in the 2011 BEA budget request to Congress.

to distribute enterprise-level data to the level of establishments. Similarly, if funding is available only to prepare national-level data, it may be necessary to develop other techniques to provide more detailed geographic detail. The Census Bureau recently developed small-area estimates for health insurance coverage using a model that combines survey data with population estimates and administrative records.[7]

Measures of International Economic Activities

In the May 2010 issue of BEA's monthly journal, the *Survey of Current Business*, Howell and Yuskavage (2010) discuss the agency's planned changes in the GDP accounts to more closely align them with new international guidelines. One example is the issue of whether the United States will have the source data to implement the recommended change for goods that are sent abroad for further processing and then return without change in ownership. The current treatment is to "impute" a change in ownership and record the values as exports and imports of goods. The recommendation would stop the imputation, exclude the merchandise from exports or imports, and include the difference in the two values as a service. The article reports on research to determine if data can be collected—by the Census Bureau, BLS, and BEA—to meet the new guidelines and if users of these data are in favor of the change. Those three agencies would need to conduct significant research to determine not only if the necessary source data can be collected, but also whether those new data will be sufficiently reliable because they will affect both the U.S. international transactions accounts and the U.S. GDP.

The article also discusses needed improvements to the data collected by BEA on international trade in services. For example, BEA has expanded the mailing list used for these surveys to reflect information from the Census Bureau's Company Organization Survey and has instituted a new survey of travel expenditures both abroad and in the United States.[8] Collecting these expenditures has proven to be a difficult task, and it is not clear whether the new survey will be successful.

Both the Census Bureau and BLS play an important role in the preparation of the U.S. international transactions accounts, note Howell and

[7]For more details on the methodology for these estimates, see the Small Area Health Insurance Estimates Program on the Census Bureau's website, see http://www.census.gov/did/www/sahie/index.html [May 2011].

[8]Such sharing was made possible by the enactment of the Confidential Information Protection and Statistical Efficiency Act of 2002. Further sharing of these lists would be possible with the enactment of the data synchronization legislation recommended by the Department of Commerce's Advisory Committee on Measuring Innovation in the 21st Century Economy (2008), discussed above.

Yuskavage (2010). The Census Bureau provides the merchandise trade data used to prepare the estimates of international trade in goods, and BLS provides the price indexes used to deflate most components of those goods estimates. Each of these programs faces data collection issues that affect the reliability of the U.S. accounts. In January 2010, the Census Bureau introduced a new methodology for the estimation of low-value imports and exports—that is, small transactions whose value falls below the exemption levels for filing the administrative documents used to generate the merchandise trade data.[9] It is hoped that future evaluation studies will confirm the utility of the new methodology.

Parker's paper also notes that BLS continues to face problems in collecting prices for intracompany transfers. In his paper, Parker states that a study conducted in 2001 concluded that BLS should make changes to improve the consistency of transfer prices by collecting data consistent with administrative definitions from the Internal Revenue Service or the Customs Service or by investigating the use of export price indexes from other countries. It does not appear that significant research has been conducted into new or improved data collection methods in this important area.

Duplication in Federal Household Surveys

Parker provided another example from household surveys, summarizing a report from the U.S. Government Accountability Office (2006):

> At the time of GAO's review, OMB had approved 584 ongoing federal statistical or research surveys, of which 40 percent were administered to individuals and households. . . . The seven surveys GAO reviewed could be considered to contain necessary duplication. GAO identified three subject areas, people without health insurance, people with disabilities, and housing, covered in multiple major surveys that could potentially involve unnecessary duplication. Although they have similarities, most of these surveys originated over several decades, and differ in their purposes, methodologies, definitions, and measurement techniques. These differences can produce widely varying estimates on similar subjects. For example, the estimate for people who were uninsured for a full year from one survey is over 50 percent higher than another survey's estimate for the same year. While agencies have undertaken efforts to standardize definitions and explain some of the differences among estimates, these issues continue to present challenges. In some cases, agencies have reexamined their existing surveys to reprioritize, redesign, combine, and eliminate some of them. Agencies have also used administrative data in conjunction with their surveys

[9]For details, see http://www.census.gov/foreign-trade/aip/lvpaper.html [May 2011].

> to enhance the quality of information and limit respondent burden. These actions have been limited in scope, however. In addition, two major changes to the portfolio of major federal household surveys are underway. The American Community Survey is intended to replace the long-form decennial census starting in 2010. . . . Officials are also redesigning the Survey of Income and Program Participation which is used in estimating future costs of certain government benefit programs. In light of these upcoming changes, OMB recognizes that the federal government can build upon agencies' practices of reexamining individual surveys. To ensure that surveys initiated under conditions, priorities, and approaches that existed decades ago are able to cost-effectively meet current and emerging information needs, there is a need to undertake a comprehensive reexamination of the long standing portfolio of major federal household surveys. The Interagency Council on Statistical Policy (ICSP), which is chaired by OMB and made up of the heads of the major statistical agencies, is responsible for coordinating statistical work and has the leadership authority to undertake this effort.

The critical challenge in this situation, Parker noted, is for the statistical system to innovate, to move beyond its traditional stovepipe approaches to integrated data collection approaches across agencies. As Robert Groves noted, the traditional stovepipe approach to surveys may not be adequate for the future, and escalating costs will prevent agencies from continuing business as usual. The effort to move away from duplicated data collections toward integrated, more cost-effective ones is one of the major challenges for the statistical system. As the GAO report states, innovation is required to standardize definitions, reduce respondent burden, and increase the use of administrative records.

The 2020 Decennial Census

Parker also discussed the decennial census in his paper, noting that it is the only data collection required by the U.S. Constitution. The decennial census has also been the focus of numerous studies by the National Research Council on how to improve the data collection and make it more cost-effective, most recently looking at planning for the 2020 census (National Research Council, 2010). In an article highlighting the conclusions of the National Research Council report, panel chair Lawrence Brown emphasized several challenges, including the exceptionally high cost of the 2010 census and growth of these costs relative to those of recent Canadian censuses; the continuing social and technological changes in the United States; the need for a focused research and development program for 2020 census planning; and reaction to the report by the Census Bureau staff (Brown, 2010). With regard to the later, he wrote (p. 31):

> We are heartened by the positive reaction of the Census Bureau to our panel's report and by the concrete steps that the Census Bureau is taking to begin 2020 census planning now, with the development of a small number of visions of alternative ways of conducting the census and plans for R&D beginning in 2011-2012. R&D focused on these alternatives could lead to more cost-effective ways of updating the Master Address File (to the benefit of the [American Community Survey] and other household surveys in addition to the census); the strategic use of the Internet and other response modes to save paper and improve data quality; the possible use of administrative records in nonresponse follow-up operations; and the full implementation of hand-held technology for a "paperless" census.

CROSS-CUTTING ISSUES

In his background paper, Habermann (2010a) took a different approach to the issue of delineating the scope of the innovation problem. Rather than concentrating on specific examples, such as measurement of economic welfare, he focused on areas that cut across all the statistical agencies. The areas that he asserted warrant more attention include

- methods to improve response;
- improving small-area estimates through models;
- better metrics to understand the relationship between nonresponse and bias;
- use and production of synthetic data and a better understanding of their strengths and limitations;
- better understanding of the likelihood of disclosure under different sets of disclosure rules;
- improvements in editing and imputation;
- refining disclosure rules to foster release of small-area data;
- understanding the impact of communication technologies on the dissemination strategies of agencies;
- helping the public understand how to interpret official and nonofficial statistics;
- working with researchers in other disciplines to understand how to adapt advances in self-tracking technologies (the use of smart phones, other electronic equipment, and software applications to track and transmit detailed information on daily living) to sample survey design and operations;
- adapting to the demands of the political community for more timely data that are "good enough"; and
- introducing multimode collection approaches in order to reduce costs and cater to respondent preferences, while understanding and neutralizing mode effects.

Habermann's paper notes that many of these are traditional problems in sample survey methodology, whereas others are created by new dynamics in both society and technology. He pointed out that some analysts have gone further to assert that it is not only specific areas that are ripe for innovation, but also that the survey research field itself is decades behind other disciplines. For example, he quoted Robert Fay (2009, p. 845), who stated

1. that research on memory has achieved a significant body of findings;
2. that the results show potential promise for understanding aspects of the limitations of survey research and the potential for improving it;[10] and
3. that the survey research community appears largely unaware of most of these developments.

WORKSHOP DISCUSSIONS

The examples in the Habermann and Parker papers were developed not to provide a complete list of issues and problems, but instead to illustrate both the critical need for innovation and the breadth of the innovation that is needed.

Lynda Carlson (National Science Foundation) agreed with Parker about the importance of innovation in providing policy-relevant data, stating that innovation is important in order for the statistical system to get the right data for policy makers. More than the need to provide policy-relevant data, she asserted, innovation is needed to shake up moribund agency processes and surveys.

In discussing the need for innovation, Groves said that escalating costs are driving the need for innovation. The costs of surveys have been rising, and the costs are expected to continue to rise as nonresponse rates increase. He argued that these escalating costs will not be tolerated by taxpayers in the future, so that the federal statistical system will not be able to continue its current business model of surveys with current methods.

Nancy Gordon (U.S. Census Bureau) noted that statistical agencies have and will continue to have real competition from other sources of information. Although this nonfederal information is generally of very low quality, the information is provided more quickly than traditional surveys, and many users are not focused on quality. She stressed that the federal statistical system must innovate in order to survive.

Richard Newell (Energy Information Administration) discussed the

[10]For example, Fay points out that some survey questions tax the limits of memory, and the potential benefits of framing problems of recall in terms of current research on memory should seem self-evident.

provision of information as a public good, which is one of the most important functions of a statistical agency. He noted that if competitors to the federal statistical system can provide data more cheaply and more quickly—even if of lower quality—then the fundamental nature of information as a public good can be significantly affected.

One of the suggested responses to the rising costs of traditional survey methods is increased use of administrative records. Clyde Tucker (Bureau of Labor Statistics) pointed out that taking advantage of administrative data not only involves understanding how to make linkages and the accuracy of administrative data, but also requires organizational change and innovation in the way statistical agencies carry out surveys.

With respect to the need for innovation, Jennifer Madans (National Center for Health Statistics) argued that innovation involves not only big projects—tectonic shifts in the methods and processes of statistical agencies—but also the everyday processes of doing smaller things.

Graham Kalton (Westat) agreed that innovation is important to produce statistics in a cost-effective way. He also suggested that it is because the statistical system is mature that big innovation projects are needed. In the early days of the statistical system, innovation was comparatively easy. Now, for example, improvements in the consumer price index are an enormous undertaking, and needed changes require substantial innovation projects.

This point was also made in the paper by Dillman (1996). He noted that in the 20 years previous to 1996, fundamental change had come rapidly to survey methodology: for example, in 1976, mail surveys were treated as something to avoid, and telephone survey methods were not considered acceptable for any important surveys. Furthermore, although mixed-mode surveys were occasionally done, questions on whether people gave different answers using different modes were not seriously considered.

Norman Bradburn (National Opinion Research Center) addressed the question of the importance of innovation by considering the workshop itself: Why is innovation the topic of an entire workshop? He answered that it is because the statistical system is mature, and people are looking for something transformative. What is needed is major innovation that will enable the federal statistical system to respond to the ever-growing challenges that it faces.

3

Barriers to Innovation

This chapter covers ways to improve the extent and pace of innovation in the federal statistical system by addressing the barriers to innovation, most of which were discussed in the workshop's third session. The main arguments on this topic from the papers by Dillman (1996) and Habermann (2010a) are summarized first, followed by the points made by the workshop participants.

STRUCTURAL BARRIERS

In Dillman's (1996) paper, he reflects on his days at the U.S. Census Bureau in the early 1990s and his involvement in projects to reduce measurement and nonresponse errors. He observes that three interconnected features of large government survey organizations make it difficult to create an environment of innovation:

1. the coexistence of research and operations cultures,
2. major differences in the dominant value systems of the research and operations cultures, and
3. the difficulty of resolving these differences in a hierarchical organization.

Coexistence of Research and Operations Cultures

As he notes (Dillman, 1996, p. 115):

> Government survey agencies face tasks unlike those usually faced in universities or private sector work. Some government surveys are of great scale and complexity, so that not only do they present huge operational problems, but much of the specific knowledge for designing and implementing the surveys must come from research which only the host agency can design and implement.
>
> A circumstance is thereby created that might be likened to, for example, an aircraft manufacturer attempting to operate an airline while continuing to design aircraft. Putting pilots and flight attendants into the same room with aeronautical and thermal systems engineers—each representing multi-million dollar enterprises with equal investment in the outcome of their common research project—could produce some unpredictable as well as strange outcomes.

It is perhaps inevitable that tension will develop between (a) employees responsible for the visible outcomes of the organization, whom the public and Congress are aware of and keep account of, and (b) employees who are part of the research arm of the organization, who are responsible for learning why and how things work and how to improve them. From the perspective of the operations culture (Dillman, 1996, p. 115):

> Good research project is "practice" in order to form impressions of whether something works. Control groups are not really necessary, and the fewer treatment groups the better. From this perspective the real value of research is as the rehearsal is to a stage performance, where one dares not fail. At the same time, those from the research culture have in mind carefully designed treatment factors and a full factorial design. Preordained rules of assignment to treatment and control groups as well as rules for interpretation of evidence must be scrupulously followed.

Both of these cultures are essential to success. However, as Dillman notes, the perceived needs of one culture can often interfere significantly with the needs of the other. The results of the coexistence of these two cultures are "differences in the core value systems of each culture and a division of responsibility that results in the overemphasis of some issues at the expense of others" (Dillman, 1996, p. 116). This is a major barrier to innovation.

Two Value Systems

As described by Dillman, the values and skills of the people in the two cultures are significantly different. Statistics is the core value of those in the research culture. However, people trained in measurement and nonresponse issues are few in number, and, Dillman asserts, they generally lack influence in the design process. The give and take of working

groups may result in decisions about sampling error being made by statisticians and decisions about measurement error and nonresponse being made by operations staff. However, Dillman argues that the skills that are valued in the operations culture have almost nothing to do with reducing measurement and nonresponse errors; rather, the valued skills involve organizing large numbers of people to get tasks done accurately, on time, and at a low cost. The result is that, although measurement and nonresponse issues have emerged as increasingly important sources of data collection error, there has not been a corresponding emergence of significant numbers of professionals to design theoretically based projects needed to ensure the development and implementation of appropriate innovations for resolving the error. Dillman characterizes this situation as a barrier to innovation.

Difficulty of Resolving the Culture Differences

Dillman notes that government statistical agencies, such as the Census Bureau, are highly complex organizations with many different tasks.[1] Not only are there several levels of hierarchy inside the organization, which makes identifying the originator of any material difficult, but also, and more importantly, there are several levels of hierarchy outside the statistical agency. He noted, for example, that the then-proposed 2000 research and development program of the Census Bureau might go through a minimum of eight entities outside the agency. Differences in organizational hierarchies may be resolved in a number of ways, such as by which entity is the most powerful or by who won the last time. As a result, compromises are common, and the decisions made by organizational hierarchies are often based on different issues from those that originally led to the negotiation. Dillman asserted that, in particular, measurement and nonresponse issues are decided in this kind of complex hierarchical process, and they "lose" to operations issues on one hand and statistical issues on the other. He notes (Dillman, 1996, p. 119):

> From the standpoint of innovation in a rapidly changing technological environment, though, hierarchical processes make such cultural and value system concerns more difficult to resolve. The down-side of hierarchy for innovation is that it forces large amounts of critical information upwards through a series of smaller and smaller funnels. This process is slow, but the information that eventually gets through represents only

[1]Although the focus of his article is on government statistical agencies and the Census Bureau in particular, Dillman noted the general nature of the issues. The solutions he presents are not unique to government survey organizations, he wrote, but also apply to universities and corporations.

> a part of the original message. In addition, the information finally communicated may bear very little resemblance to the original message.

A further problem of hierarchical decision making, according to Dillman, is that horizontal flows of innovative ideas and the promotion of active discussion of these ideas at an early stage are discouraged. In the absence of a more formal regularized process to discuss possible innovations, the ideas that do flow horizontally are usually by word of mouth. One result is that the ideas often become distorted and misunderstood by those in the hierarchy. He ends by noting that "the effects of hierarchical processes [are] to slow down and sometimes thwart altogether needed innovation and change" (Dillman, 1996, p. 120).

OTHER BARRIERS

The paper by Habermann (2010a) agrees with Dillman about the problems produced by the coexistence of different cultures in a statistical agency, but it considers several additional barriers:

- the lack of investments in research and innovation by statistical agencies;
- the inability or unwillingness of the administration or Congress or both to take a long-term view of research and innovation;
- the low standing of statistics as a priority;
- the inability of statistical agencies to make a sufficiently strong case for innovation funds;
- the inability to attract the needed leadership;
- the difficulty of creating an environment in which questioning conventional logic is welcomed;
- insufficient numbers of appropriately trained statisticians;
- insufficient numbers of appropriately trained managers and leaders;
- inadequate pay for senior-level researchers;
- the inability to recruit non-U.S. citizens;
- the lack of critical mass of research staff in many agencies;
- contracting rules that inhibit working relationships with academics and contractors; and
- lengthy bureaucratic hiring procedures.

Several of these barriers concern leadership in the federal statistical system. This theme of the importance and need for leadership was echoed by many of the workshop participants.

WORKSHOP DISCUSSIONS

Leadership

In discussing the critical path to innovation, John Haltiwanger (University of Maryland) pointed out the necessity for somebody at the top of an organization to take responsibility for innovation. Leaders must make it clear that they want innovation, and they want it now. Innovation does not just happen. With respect to not being able to attract sufficient numbers of new staff with the correct skill set, he observed that prospective students know which organizations are research friendly and that leadership is needed to create research friendly organizations.

Following on this subject, Ivan Fellegi (Statistics Canada) noted that one of the principal barriers to attracting staff is one of image; however, he said, the image of a statistical agency can be changed. In identifying the barriers to innovation, he pointedly observed, one need not look any further than to the participants in the workshop, who included the leadership of many U.S. federal statistical agencies. He suggested that, although it is not easy, successful statistical offices can create an environment for innovation. Leaders create this environment or culture through their own behavior and the structures they put in place. Moreover, leadership is required to ensure that the right questions are being asked and that the answers to the questions are correctly and appropriately dealt with.

This theme of the importance of leadership was picked up by several other participants. Ruth Ann Killion (U.S. Census Bureau) noted that mangers are responsible for developing a culture of innovation, and Andrew White (National Center for Education Statistics) suggested that implementing a culture of innovation comes from the senior leaders of an agency. He essentially agreed with Fellegi, commenting that everyone attending the workshop is responsible for instituting that culture.

Jennifer Madans noted that this type of meeting has been held before, and little if anything has come from the effort. She observed that the leaders of the statistical system—all of the people in the room—are responsible for the lack of progress. Although it is true that a decentralized system makes it hard to have a joint response, she said, the federal statistical system nevertheless needs to act or die.

Clyde Tucker commented on the importance of leadership in the area of administrative data. If the federal statistical system is to accomplish the necessary organizational change so that the system can take advantage of administrative data, then leadership will be needed to do so. Leadership is particularly important for administrative data, because statisticians are trained and in their usual activities are used to working with surveys and not administrative data.

Constance Citro noted that agency staff often do not know how the

data they provide to the public are used. To understand the problems and attributes of the data that agencies produce, it is critical that they analyze those data. It is leadership that sets the direction for an agency to ensure that this kind of analysis is performed.

Richard Newell asked if the barrier was the inability to implement existing ideas as opposed to developing new ideas. In order to be innovative, agencies must have a thirst for new knowledge, and leaders have to create an environment for slaking such a thirst.

Communication and Collaboration

In addition to leadership, the other most frequently mentioned barrier to innovation is the lack of communication and collaboration within and between agencies. This issue was raised by Brian Harris-Kojetin (U.S. Office of Management and Budget), who said that in his observations not only do different agencies that experience the same problem not talk to each other, but even within an agency there can be significant problems of communication.

Marilyn Seastrom (National Center for Education Statistics) developed this theme with reference to specific issues that are common to agencies in the federal statistical system. She suggested that the key to innovation in cost savings, data dissemination tools, data visualization, and metadata standards is collaboration among agencies.

Barry Nussbaum (U.S. Environmental Protection Agency) suggested that the problem of communication extends to the fundamental issue of understanding the needs of users. This is critical for success in innovation: staff have to work with data and understand how they were acquired and what their properties are. To do that requires working in the weeds of data acquisition, where one can truly understand the properties of data and the basics of data collection.

In this context, Haltiwanger said a related problem is the inability of researchers inside and outside the government to drill down in their analysis. He observed that this inability to go deeper into the relationships among variables is due to a lack of data sharing among agencies, limited access to microdata, and lack of federal and state cooperation. In general, he said, improving communications within an agency could bear a great deal of fruit in terms of breaking down barriers to innovation.

Citro noted that one of the barriers related to communication is a lack of understanding between the user community and the research community and between the federal statistical agencies and private contractors. Allen Schirm (Mathematica Policy Research) pointed to the workshop itself as an example of the need to broaden interactions and establish better communication. He noted the absence of significant numbers of young

people at the workshop. He commented that it would also be beneficial if the Interagency Committee on Statistical Policy (ICSP) Working Group on Innovation had participation from the private sector.

Operational and Innovation Cultures

Several participants responded to the points in the Dillman (1996) paper on the coexistence of an operations culture and a research culture. Lynda Carlson agreed that operational matters often trump work on innovation. In response to earlier comments from Graham Kalton about the need for large, major innovation projects, Madans suggested that implementation of big innovation projects can set up a tension between who is thought to be doing innovation and who is not. One of the results of this tension can be a lack of communication between the operations staff and the research staff. It is important, therefore, to build innovation into everyone's job.

Thomas Louis also suggested that one of the challenges is to make innovation a part of the usual work of staff. Nussbaum reported on experiences at the U.S. Environmental Protection Agency (EPA), stating that the secret to innovation at the EPA is not to call it innovation. In fact, setting up a bureaucratic process that is supposed to innovate inhibits individual initiative.

Fear of Failure

Carlson proposed another barrier to innovation—the fear of failure—that was not discussed in any of the background papers. She noted that innovation is by its very nature risky and that the budget and performance process as practiced by the federal government militates against taking risk. It is safer not to try to innovate and thus avoid the penalties that these systems would impose for failure.

Ronald Fecso (U.S. Government Accountability Office) agreed that fear is an important barrier, and performance plans impede risk-taking by encouraging people to take the easier path of the status quo. It is important to get over the fear of failure, he said. Moreover, the system needs to focus more on understanding user needs and answering the important new questions and not just on improving the answers to existing questions.

Edward Spar (Council of Professional Associations on Federal Statistics) emphasized the point that with risk comes the possibility of failure. Although this may appear to be obvious, people must accept this and learn to live with it. In this vein, Ron Bianchi (Economic Research Service, U.S. Department of Agriculture) suggested that the concept of a risk-free

idea is in a sense vacuous, since a risk-free idea is equivalent to a work-free zone.

Case Studies

Several workshop participants mentioned the lack of successful case studies as a barrier to innovation, commenting on the need for better case studies of innovation that could be used by agencies. According to Thomas Mesenbourg (U.S. Census Bureau), components of such studies include who drove the innovation project, who opposed it, what challenges were encountered, and what were the keys to success. Newell observed that it might be useful to identify a set of best practices and to include in the case studies the human capital dimension and descriptions of the research infrastructure and internal practices. Sally Morton (University of Pittsburgh) provided a cautionary note with respect to case studies. Although they may be helpful, she said, barriers are changing over time and what worked previously may not succeed now.

Christopher Carroll (Council of Economic Advisers) extended the idea of case studies to comparisons with others outside the system. It is important for each agency to compare how it is doing with others. More specifically, the statistical system and individual agencies should seek to understand why federal statistics are different from other statistics that are ostensibly measuring the same thing. For example: Why do different estimates for employment result from household surveys and payroll surveys?

Lack of Statistical Expertise

Harris-Kojetin said in his view the most important barrier is a lack of skilled people and expertise. In this regard, it is important to recognize that there is a wide demand for statisticians outside government, and they may have expertise that is lacking inside the government. Therefore, the federal statistical system should remove any barriers that prevent linking communities inside and outside government that employ statisticians. For example, the federal system should look to other mature organizations that have encountered the barriers discussed in the background papers and in the workshop discussions.

This theme of insufficient skilled personnel as a barrier was taken up by Kalton, who emphasized the importance of updating skills. He pointed out that this need to update skills is more important than in the past. Statistics has evolved into many subdisciplines, each of which requires particular high-level skills. An example of this was provided by Judith Rowe (Princeton University), who pointed out that there are two kinds of

administrative data, mandatory and voluntary, and that they require different kinds of statistical solutions. Carlson added that the skills needed for innovation projects are often lacking in both agencies and government contractors.

Organizational and Process Barriers

Some barriers can be thought of as structural in nature—that is, they exist because of processes imposed on an agency as a unit in the federal government. Other barriers may be amenable to individual agency initiative. Haltiwanger pictured the federal statistical system as a huge, lumbering organization, which he called a barrier to innovation. Innovation needs to be a grassroots activity, he argued, and it is better to have many smaller activities rather than a few major ones. For innovation to succeed, it is not necessary to have a grand plan with huge numbers of people. Agencies have to understand how to build incubators of innovation and allow them to flourish. Robert Groves also liked the idea of multiple grassroots projects.

Among the system-wide barriers that were noted during the discussion, several related to the nature of the budget process and procurement rules. Michael Horrigan (Bureau of Labor Statistics) said that one of the barriers to innovation is that the budget process requires more certainty than one has when trying to innovate. It is difficult to obtain funding for projects in the absence of a guaranteed outcome, and being up-front about the risk endangers the likelihood of obtaining funding.

In the same vein, Mesenbourg asserted that one needs a clear imperative or mandate to fund large improvement projects. As an example, he stated that the recent recession did create such a mandate for improvements in data collection in the service sector, and the Longitudinal Employer-Household Dynamics Program became a very easy sell in the wake of the recent financial crisis.

With respect to procurement and recruitment, Carlson said that current government-wide rules make it difficult, if not impossible, to enter into flexible agreements with contractors to pursue innovation projects.

Groves suggested that there are different barriers for small and large agencies, and therefore the solutions may be different for different agencies. Particularly for small agencies, coalitions across agencies and improved contracting procedures are important, he said. The issue then becomes one of how to systemically encourage coalitions and alliances.

Newell pointed to a different kind of structural problem: a monopolistic environment and lack of competition that can lead to stagnation and a failure to innovate. Agencies that find themselves in a monopolis-

tic position may not be attentive to changing demand and may develop institutional structures that resist change.

With respect to organizational barriers in an individual agency, Haltiwanger said that in his view the location of a research organization within the agency is very important. Agency research organizations are properly dedicated to the function of research, although they can still be integrated into the work of the agency.

Users as a Barrier

With respect to the barriers to innovation, Eva Jacobs (Bureau of Labor Statistics) noted that sometimes the user is the barrier. For example, users of the consumer price index (CPI) and other surveys do not like change in the time series or the questions that are asked. In order to produce anything new in the CPI, you have to sell it, she said—both to labor organizations and to business organizations.

4

Possible Remedies to Barriers

This chapter covers the workshop discussions of ways to remedy the barriers to innovation discussed in Chapter 3. The background papers by Dillman (1996) and Habermann (2010a) are summarized first, followed by the discussion of the workshop participants.

OVERCOMING THE ENVIRONMENTS THAT HINDER INNOVATION

In his paper, Dillman outlined three steps to overcome the three interconnected features of large government survey organizations that make it difficult to create an environment of innovation, discussed in Chapter 3.

First, he noted that for research to positively affect government survey practice, much of it must be done on government surveys, but the professionals are not there in sufficient numbers to do this. In particular, he singled out the need to bring into the government professionals who are able to resolve issues of measurement and nonresponse error.

The second step is to build the capacity to understand and deal with sources of nonsampling error into the operations culture. This is necessary because many of the decisions that are made at the operations level directly affect measurement and nonresponse. As examples, his paper mentions "question wording and order, the way a form or questionnaire is constructed on a page, the information included as part of an address, the class of postage used, whether letters include dates, the contents of those letters, whether letterhead stationery is used, and the kind of mail

processing equipment purchased" (Dillman, 1996, p. 122). He stresses the importance of instilling this capability into the information technology parts of an organization, since, on one hand, the acquisition of information technology is one of the main driving forces in innovation, and, on the other hand, information technology units are often concerned with operational efficiency and not reduction of survey error. Adoption of new technologies should contribute to the reduction of survey errors, not exacerbate them.

The third step he proposed is to take measures to eliminate problems in reliable and timely communications that may be caused by the overly hierarchical nature of the organization. These measures have two components. One is that communication should not be viewed as a control function but as a means to promote the flow of information to as many people as possible in as short a time as possible. The other is to ensure that neither the research nor the operations culture entirely dominates the other. He notes (Dillman, 1996, p. 123): "A government survey organization that allows either the research culture or operations culture to control the other will neither be innovative in an effective way nor will it conduct, in the long run, high quality surveys. The organizational structure needed is one that encourages each to influence the other and allows disagreements to be worked out quickly, at lower levels under an umbrella of shared purpose."

Dillman also observes that the barriers and remedies that he proposes are not unique to federal statistical agencies (Dillman, 1996, p. 124): "Universities, large corporations, and others all find themselves struggling with how to facilitate needed innovation, rather than unnecessarily thwarting it."

LEADERSHIP AND FOCUS

As did the workshop participants, the Habermann paper (2010a) stresses the importance of leadership:

> It is the leadership of each agency—including the senior managers—who are responsible for fostering an innovative spirit and for carrying out innovation in that agency. It is leadership who are responsible for inspiring and rewarding staff, and for developing solutions in spite of the constraints placed on the agency. It is, after all, agency leadership that must ensure that the necessary investments in innovation are made and the necessary changes to business processes are accomplished. Moreover, it is not sufficient to manage an agency; one has to manage a technical agency. Leadership then can assist in attracting and retaining staff through improved (less bureaucratic) working conditions and fostering a spirit of excitement. Leadership must also wrestle with the difficult

problem of encouraging change in an environment where day-to-day operational outputs are of paramount importance to the public.

Although there is no silver bullet to solve the problem of finding tomorrow's leaders for the statistical agencies, Habermann's paper suggests that there is a system-wide change that might make a significant difference for the future. This change would elevate the status of the heads of statistical agencies in their department and with Congress, as well as allow for easier access for these leaders to the decision-making processes of the executive branch. Currently some, though not all of the heads of the statistical agencies, are presidential appointees requiring Senate confirmation (known as PAS). The change would be to require that each agency head be a PAS with a term appointment. In his paper, Habermann asserts that such a change would raise the visibility of all the statistical agencies and make it easier for them to promote their budgets and to gain the appropriate measure of independence necessary for success.

Although leadership is a necessary condition for innovation, it may not be sufficient. In particular, Habermann's paper addresses three other areas that, in his view, require system-wide attention: recruitment, working relations with academic researchers and with private contractors, and a more centralized focus for research and innovation.

Recruitment

Habermann's paper acknowledges that there are many excellent statisticians in the federal statistical system. However, their numbers are not sufficient to meet the demands placed on the system for more innovation. Moreover, as mentioned earlier, the skill set required for research and innovation is relatively rare. The primary method of attracting researchers into the federal statistical system is through recruitment of new graduates—who must be U.S. citizens—at the master's and doctorate levels. However, many otherwise excellent candidates are not U.S. citizens, and, with few exceptions, they cannot be hired by federal statistical agencies. To change this would be a significant task and would require legislation, and the paper acknowledges that such a change is unlikely in the current political climate. Consequently, according to Habermann's paper, consideration might be given to another idea: creating a private not-for-profit research center, devoted to the problems of the federal statistical system, which is not hindered by the hiring constraints of federal agencies.

Relations with Academic Researchers and Private Contractors

Even if the federal statistical system did employ significant numbers of staff with the correct skill set, it would still be beneficial, and in fact necessary, for them to work cooperatively with researchers in academic institutions and the private sector. System-wide leadership is needed for agencies to develop the ability to enter into flexible cooperative agreements with academic and other institutions. Although there are cooperative agreements in some agencies, even in these cases it is often the department that makes the final decision. According to Habermann's paper, it would be helpful if all statistical agencies could have flexibility in their grant-making ability and in working with universities to support graduate students.

A Central Focus for Research and Innovation

The ability to undertake significant innovation projects requires a critical mass of research personnel in many agencies. This critical mass is lacking in most agencies. Even if the agencies were able to recruit noncitizens, the inability to create such a critical mass would still exist simply because of the numbers of staff required. Moreover, the absence of a central focus makes it difficult for the statistical system, acting a whole, to prioritize and focus on system-wide innovation problems.

Habermann's paper discusses two options that could aid in the solution of these problems. One approach would be to empower a single agency (e.g., the Census Bureau, the Bureau of Labor Statistics) to act as the focus for innovation for the entire statistical system. Direction for the single-agency research program could come from the Statistical Policy Office of the Office of Management and Budget (OMB) through the Interagency Committee on Statistical Policy (ICSP). Such an approach would require a level of integration that does not now exist in the federal statistical system, and the success of this approach would require successful solutions to the problems of recruitment and working relationships discussed above.

If it is not possible to simplify the recruitment process or to hire noncitizens, and if the contracting rules prove intractable to change, then a more innovative approach to providing a central focus for research and innovation may be required. Habermann's paper discusses the approach of a private not-for-profit research center. The employees would not be federal employees and therefore would not be subject to the recruitment and retention rules of the federal government. Such a center could take advantage of contracting rules that would allow flexible working relationships with the government. It would also require authority from OMB through the ICSP. In this approach, research would take place at

the center, at universities, and by federal contractors (under contract with the center). Habermann's paper notes that the number of employees at this center need not be large.

WORKSHOP DISCUSSIONS

Although several possible remedies to overcoming the barriers to innovation were discussed by the workshop participants, changes in leadership and research programs were among the most commented on. Three other topics in the discussion were periodic review and feedback from users, innovation incubators, and the criteria for successful innovation.

Leadership

The need to improve leadership was mentioned by many participants as critical to improving innovation, and some had specific ideas about how leadership can provide remedies to innovation barriers.

Robert Groves said that statistical agencies need to reexamine the existing boundaries between agencies. In particular, he suggested, leadership was needed so that the system could reconceptualize agency boundaries and the nature of collaborative activities between agencies, as well as the boundaries with outside entities. Noting that small and large agencies have different barriers and therefore different solutions, he said that one issue is how to systemically encourage coalitions and alliances.

Cynthia Clark (National Agricultural Statistics Service) observed that leadership is needed to develop policies that encourage the movement of staff between different organizations and that this would help break down some of the existing barriers between agencies.

Steven Landefeld (Bureau of Economic Analysis) stressed the importance of leadership in providing the correct incentives for innovative work and changing the incentives as conditions warrant. Since the federal statistical system is a decentralized one and likely to stay that way, he pointed out the need for more centralized leadership and direction. He extended the concept of incentives to advisory committees, noting that it is also important for advisory committees to have the correct incentives to maximize their usefulness. Landefeld stated that, although there is never going to be a Statistics USA centralized statistical system, in his view stronger leadership is needed at the top with the authority to make some decisions about priorities in the budget process and about cross-cutting priorities.

The need for incentives for outside researchers and for agency staff was also noted by John Eltinge (Bureau of Labor Statistics).

Clark noted the need to make greater use of cooperative agreements

with states and land grant universities as well as the need to encourage the development of interdisciplinary teams. Constance Citro remarked that it might be beneficial to extend the ability that the National Agricultural Statistics Service has for making cooperative agreements to other agencies, but that would require new legislation.

Research

Several of the workshop attendees remarked on the importance of research in enhancing innovation in the federal statistical system. Both Landefeld and Steven Dillingham (Bureau of Transportation Statistics) observed that cross-cutting research could be centralized, as suggested in Habermann's paper. Landefeld, however, said that individual agencies would still need the ability to carry out research on specific topics relevant to their missions, such as national accounts.

Manuel de la Puente (Social Security Administration) pointed out that extramural research can bring into an agency outside people with new skills and abilities. To promote the synergies of extramural research, it is important to pair up outside researchers with internal agency staff. Edward Sondik (National Center for Health Statistics) agreed, asserting that it is stimulating for staff to be involved in extramural work.

Both Thomas Louis and Roderick Little (University of Michigan) commented on the type of research being performed by federal agencies. Little said that research by the federal statistical system may be skewed too far toward the observational end of the spectrum and not enough toward the experimental design end. Louis concurred, saying that it is critical for experiments to have the ability to compare approach A with approach B. In building a productive research program, it is necessary to attract researchers from outside the federal system. One way to do this, according to Groves, is through the use of the Intergovernmental Personnel Act. This allows researchers, primarily from academic institutions, to leave the academic world for a specified period of time, work in a statistical agency, and then return.

Periodic Review and Feedback from Users

The importance of a periodic review of statistical programs to overcome barriers to innovation was stressed by several participants. Allan Schirm and Little discussed the need for regular evaluations of statistical programs, including their fitness for use. David Banks (Duke University) said that it would be useful to hold a workshop every five years on how to organize a statistical agency as if for the first time.

With respect to review and evaluation, Groves noted that creative

destruction of statistical programs is not usually practiced by statistical agencies, although external pressures, such as budgets, can induce it.

With respect to periodic reviews, Clyde Tucker pointed out that 20 years have passed since enactment of the Government Performance and Results Act, and there have been few serious interagency efforts to develop quantitative performance metrics. He noted that the best example of such a metric is the OMB standard on nonresponse bias.

Both E.J. Reedy (Ewing Marion Kauffman Foundation) and Edward Spar (Council of Professional Association on Federal Statistics) commented on the issue of feedback from users. Reedy stated that agencies, from the top down, need to interact with users to provide and get feedback and connect with data users. He suggested that agencies should put a notice about seeking feedback on the websites where their data reside, so users see it when they want to download data. Spar observed that agencies usually provide information to users on what they (the agencies) are doing; they need to make greater efforts to understand the users' perspectives. In obtaining that feedback, William O'Hare (Annie E. Casey Foundation) suggested that clearer communication can build public support. In that vein, agencies need to learn how to use Facebook, Twitter, and other social networking tools, he said.

Innovation Incubators

Several participants supported the concept of innovation incubators or laboratories in which ideas for innovation could be developed and tested. Ron Bianchi noted that this could be coupled with the concept of promoting contests for innovation, as is done at the National Aeronautics and Space Administration.

Eltinge said it is important that the statistical system and the individual agencies learn how to infuse new technologies into the system. The example he used was how, in the 1940s, Iowa farmers learned to accept the mechanization of agriculture and hybrid seed corn.

John Haltiwanger suggested that the statistical agencies could work with foundations, communities, and corporations, such as IBM, that have experience with building incubators and allowing them to flourish. The hard part is ensuring that the innovation ideas from incubators are not left to wither and die. He noted that it takes senior management buy-in to move incubation products into the mainstream of an organization.

Emerson Elliott (National Council for Accreditation of Teacher Education) suggested that OMB could establish a culture of innovation. For that to take place, the ICSP would be very important. In this respect, Eltinge observed that the statistical system cannot keep living off previous capital investments in innovation; it needs to make new investments in capital.

Peter Meyer (Bureau of Labor Statistics) suggested a specific incubator project: a Wikipedia type of website across the statistical agencies, which he called Statipedia. Such a website could be used to build a common online glossary of terms and to share experiences and knowledge. Thus, for example, computer source code and technical innovations could be shared across agencies. Barry Nussbaum was enthusiastic about the idea and offered cooperation in hosting the website.

Criteria for Successful Innovation

Ivan Fellegi identified three criteria for a successful research or innovation program. First, such a program has to be directly linked to the operational activities of the agency, so that it is driven by acute issues of practice or by opportunities detected in practice. In addition to being directly linked, there needs to be distance between research and practice, and there also needs to be a balance between the independence of the research and its relevance.

He also offered comments on the ideas discussed in Habermann's paper. He agreed with the crucial role of leadership for maintaining independence while ensuring relevance. However, he thought that research centralized in one agency or in a federally funded research and development center was going too far, because of the distance problem. He said that the research function would not be aware of the operational requirements and would not be relevant to the practice issues of the agency.

Instead, Fellegi outlined four specific steps that could be taken to foster innovation in statistical agencies:

1. the bureaucratic barriers to efficient and effective contracting and recruitment could be removed, with the lead to this taken by OMB;
2. an organized marketing of the problems and opportunities of the federal statistical system to academic institutions could be undertaken;
3. case studies of successful—and unsuccessful—examples of innovations could be compiled and disseminated; and
4. progress could be measured periodically.

5

Next Steps

The last workshop session was devoted to possible next steps. The participants were invited to identify, in view of the previous discussion, ways that innovation could play a more prominent role in the federal statistical system.

OVERVIEWS

Katherine Wallman began the discussion with an overview of several important points made throughout the workshop discussions as well as her own views:

- It is important to recognize the idea of Robert Groves's "creative misfits," who can produce new ideas.
- The federal statistical system is a mature system, and change may require major initiatives, as pointed out by Graham Kalton.
- Although administrative records show great promise and are widely believed to be critical for future data collections, their use always seems to be a year away, as John Haltiwanger noted.
- Sometimes the problem in fostering innovation, as Richard Newell said, is a lack of ideas, and sometimes it is the inability to implement new ideas.
- Competition can be an impediment to innovation, as John Thompson (National Opinion Research Center) noted; collaboration is critical.

- A key to innovation is the willingness of the senior managers present at the workshop to provide the necessary leadership and to follow through on the ideas discussed at the workshop.
- The Office of Management and Budget is responsible for providing leadership in eliminating bureaucratic barriers in contracting and recruitment.
- A system-wide marketing plan to academic institutions could stimulate academic work on federal statistical problems.
- Case studies of best practices could be useful in providing guidance on how to stimulate innovation.
- Communication within and between agencies could be improved.
- Progress in innovation needs to be measured periodically.

Edward Sondik followed Wallman's overview with some ideas on next steps for the federal statistical system:

- Annual or biannual reports on key innovations and research could be developed and disseminated.
- Although he does not support a centralized research program, the federal statistical system could develop a joint federal statistics research agenda.
- The Interagency Committee on Statistical Policy (ICSP) could take the lead in developing a marketing program with academic institutions.
- The ICSP could provide leadership in establishing an innovation culture in the federal statistical system.

Thomas Louis stressed the importance of accountability and agreed with others on the importance of a periodic review and evaluation of statistical programs. He also made the general comment that it is important for at least a subset of the agencies to work on specific innovation projects while discussion proceeds on the larger issue of innovation in the federal statistical system. He stressed that he is not implying that innovation is not taking place, but perhaps the discussion today could lead to a different angle to implementing innovation projects. For example, he suggested looking at innovation in an existing area, like seasonal adjustment, that proceeds from databases to tables and figures with reasonably seamless connections. The project need not be a new procedure but an embodiment of many new changes. It is important for such a project to be examined by a variety of agencies to disseminate the lessons learned.

Lawrence Brown (University of Pennsylvania) asked Hermann Habermann (Committee on National Statistics), who was charged with writing the summary of the workshop, what he had heard. Habermann

commented that this could be a seminal moment for the federal statistical system—an opportunity for the system to consider how it wants to pursue research and innovation. He noted that many participants favored some cross-cutting centralized research approach, although with each agency having the ability to retain local creativity and focus. In this connection, he said, the statistical system could build on past successes of the Federal Committee on Statistical Methodology. He observed that many opportunities to encourage innovation had been suggested, such as the need to remove bureaucratic barriers to contracting and recruitment, but it is not clear that the system has the necessary will to follow through.

Much of the remaining discussion focused on the importance of leadership and the ICSP in particular, interagency efforts, and case studies and best practices.

LEADERSHIP

Jennifer Madans asked if the system would be able to use this workshop on innovation and create a more interactive statistical system. She noted that much of what had been discussed was under the purview of the ICSP and that it needed different ways of communicating.

Groves said he supports the development of a system-wide research agenda that identifies common research problems, but he cautioned that addressing turf issues will be difficult. He said that it probably would be necessary for the ICSP to explore legal and sustainable limits of collaboration across agencies.

Although she supports efforts to blur the traditional bureaucratic boundaries, Madans said that thought was needed to ensure that smaller agencies would not get gobbled up by some of the bigger agencies.

INTERAGENCY EFFORTS

Marilyn Seastrom offered an example of concrete cross-agency innovation, the Statistical Community of Practice and Engagement.[1] Mark Harris (National Agricultural Statistics Service) mentioned another example, the Federal Committee on Statistical Methodology, although he noted that it is more involved with the documentation of best practices than with cutting-edge innovation. He pointed out that some of its projects have been incredibly productive as a result of the creativity and participation of staff from many agencies. He also commented that often the

[1]See http://www.apdu.org/conference/2010/Bianchi_APDUPresentation9-16-10.ppt#260,6, SCOP Goals = OMB Goals [February 2011]. SCOP was subsequently renamed SCOPE, Statistical Community of Practice and Engagement.

problem with developing successful projects is not in getting the correct people, but in getting agencies to offer any people at all.

Nathaniel Schenker (National Center for Health Statistics) mentioned the importance of transferring methods and techniques invented at one agency to others. Wallman asked how one can institutionalize the idea that interagency collaborative work is part of what is expected of statistical agency staff, rather than something extra that is not important to their jobs.

John Eltinge emphasized the importance of ensuring that interagency initiatives resonate and be consistent with the mission of an agency's department as well as appropriate congressional committees. In this connection, he suggested that since selling risk and cost may be difficult, the statistical system could consider framing initiatives as value added rather than as innovations.

In considering next steps to innovation, David Banks stressed the point made by Schenker about the importance of transferring innovative ideas from one agency to another. Nancy Gordon supported the concept but cautioned that to be successful it is necessary to deal with the "not invented here" syndrome.

CASE STUDIES AND BEST PRACTICES

Schenker returned to the idea of case studies and suggested that what is needed is a prestigious way to publish papers on case studies and innovative ways of using existing techniques. With respect to best practices, Roderick Little cautioned that best practices can be the opposite of innovation: a best practice may be considered the best thing to do—so why try something else?

CLOSING

In his closing comments, Louis returned to the reason that innovation is critical for statistical agencies at this time. One of the important reasons is that the assumptions and models on which the statistical system was built are changing. He made the analogy that, at one time, "Biostatistics Department" was the equivalent of a brand name for all things in biostatistics, but that is no longer true. This analogy holds for the federal statistical system: it is no longer the only place where federal statistics is done in every sense. Increasingly, for example, there are other sources for data. He suggested that although it might not be a sufficient step, the system may find it necessary to elevate the amount and visibility of innovation and research to maintain its brand name in federal statistics.

References

Advisory Committee on Measuring Innovation in the 21st Century Economy. (2008). *Innovation Measurement: Tracking the State of Innovation in the American Economy.* A report to the Secretary of Commerce. Available: http://www.innovationmetrics.gov/Innovation%20Measurement%2001-08%20rev%20040908.pdf [May 2011].

Aizcorbe, A.M, Moylan, C.E., and Robbins, C.A. (2009). BEA briefing: Toward better measurement of innovation and intangibles. *Survey of Current Business,* January, 10-23.

Bianchi, R. (2010). *The Horizontal Approach to Open Government Through Collaboration, Data Sharing, and IT Consolidation.* Session on Innovations in Data Access, Dissemination, and Visualization. Association of Public Data Users 2010 Annual Conference, September 20-21, U.S. Department of Agriculture Economic Research Service, Washington, DC.

Blank, R. (2010). *What Did We Learn About Gaps in Our Statistics During the Recent Recession?* Presentation at the National Association for Business Economics Professional Development Seminar, April 13, Arlington, VA.

Bradburn, N. (1999). The future of federal statistics in the information age. *Journal of Official Statistics, 15*(3).

Brown, L. (2010). Science policy news: Envisioning the 2020 census. *Amstat News,* May, 29-31.

Dillman, D.A. (1996). Why innovation is difficult in government surveys. *Journal of Official Statistics, 12*(2), 113-124.

Fay, R.E. (2009). *Why Is Survey Research 20 Years Behind?* Section on Survey Research Methods, Joint Statistical Meetings. Available: http://www.amstat.org/sections/srms/Proceedings/y2009/Files/303419.pdf [May 2011].

Gertner, J. (2010). The rise and fall of the GDP. *New York Times Magazine,* May 10, 60-71.

Habermann, H. (2010a). *Barriers to Innovation and Possible Remedies.* Paper prepared for the Committee on National Statistics Workshop on Facilitating Innovation in the Federal Statistical System, June, National Research Council, Washington, DC. Available: http://www7.nationalacademies.org/cnstat/Habermann%20Paper.pdf [May 2011].

Habermann, H. (2010b). The future of innovation in the federal statistical system. *Annals of the American Academy of Political and Social Science, 631*(1), 194-203, Kenneth Prewitt special editor.

Howell, K., and Yuskavage, R. (2010). BEA briefing: Modernizing and enhancing BEA's international economic accounts. *Survey of Current Business,* May, 6-20.

International Monetary Fund. (2009). *Balance of Payments and International Investment Position Manual, 6th Edition.* Washington DC: Author.

Knapp, J. (1996). Measurement for the future: The vital role of statistics. *Review of Business, 17*(3-7).

Krueger, A. (2010). Stress testing economic data. *Business Economics,* April, 110-115.

Landefeld, J.S., Moulton, B.R., Platt, J.D., and Villones, S.M. (2010). GDP and beyond: Measuring economic progress and sustainability. *Survey of Current Business, 90*(April), 12-25.

National Research Council. (2009). *Principles and Practices for a Federal Statistical Agency, 4th Edition*. Committee on National Statistics. C.F. Citro, M.E. Martin, and M.L. Straf (eds.). Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

National Research Council. (2010). *Envisioning the 2020 Census*. Panel on the Design of the 2010 Census Program of Evaluations and Experiments. L.D. Brown, M.L. Cohen, D.L. Cork, and C.F. Citro (eds.). Committee on National Statistics. Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Parker, R.P. (2010). *Challenges to the Federal Statistical System to Continue to Provide Data Relevant to Policy Issues.* Paper prepared for the Committee on National Statistics Workshop on Facilitating Innovation in the Federal Statistical System, June, National Research Council, Washington, DC (revised draft, June 21). Available: http://www7.nationalacademies.org/cnstat/Parker%20Paper.pdf [May 2011].

Spar, E. (2009). Challenges facing federal statistics in the United States. *Amstat News,* November.

Stiglitz, J.E., Sen, A., and Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Available: http://www.wikiprogress.org/images/Stiglitz_Report.pdf [May 2011].

U.S. Census Bureau. (2009). *Import and Export Low Value Estimation*. December 10. Available: http://www.census.gov/foreign-trade/aip/lvpaper.html [May 2011].

U.S. Census Bureau. (2011). *Small Area Health Insurance Estimates Program*. February. Available: http://www.census.gov/did/www/sahie/index.html [May 2011].

U.S. Government Accountability Office. (2004). *Informing Our Nation: Improving How to Understand and Assess the USA's Position and Progress*. GAO-05-1. November 10. Washington, DC: U.S. Government Printing Office.

U.S. Government Accountability Office. (2006). *Federal Information Collection: A Reexamination of the Portfolio of Major Federal Household Surveys Is Needed*. GAO-07-62. November 15. Washington, DC: U.S. Government Printing Office. Available: http://www.gao.gov/new.items/d0762.pdf [May 2011].

U.S. Government Accountability Office. (2011). *Key Indicator Systems: Experiences of Other National and Subnational Systems Offer Insights for the United States.* GAO-11-396. March 31. Washington, DC: U.S. Government Printing Office. Available: http://www.gao.gov/new.items/d11396.pdf [May 2011].

Appendix A

Workshop Agenda

FACILITATING INNOVATION IN THE FEDERAL STATISTICAL SYSTEM

Tuesday, June 29, 2010
National Academies Keck Center, Room 100
500 Fifth Street, NW, Washington, DC

Abstract: This workshop is intended to generate a wide spectrum of views on the state of innovation in the federal statistical system and possible ways to facilitate innovation in areas that are important for the future of the system. Representatives from the statistical system and the academic and private sectors are being invited to sit at a central table, with room for attendees on each side. The intent is to have a free-flowing set of discussions, which will be captured in a workshop summary to be widely distributed. Session I will focus on why innovation is necessary for the health of the federal statistical system and its ability to provide information for the public and decision makers. Session II will address areas in which innovation is not as well developed as would be desirable in terms of the cost, quality, timeliness, and relevance of federal statistics. Session III will address barriers to innovation and possible remedies. A panel will then discuss next steps in Session IV.

8:30 am **Welcome and Introductory Remarks**

Conference Overview
—Thomas Louis, Johns Hopkins School of Public Health, and Chair

Welcome on Behalf of CNSTAT and the National Academies
—Constance Citro, Director, Committee on National Statistics

The Federal Perspective
—Katherine Wallman, Chief Statistician, U.S. Office of Management and Budget

9:00 **Session I: The Importance of Innovation in Federal Statistics**

Chair: Thomas Louis, Johns Hopkins School of Public Health

Discussants:

Ron Bianchi, Economic Research Service, U.S. Department of Agriculture
Lawrence Brown, The Wharton School, University of Pennsylvania (CNSTAT chair)
Lynda Carlson, National Center for Science and Engineering Statistics, National Science Foundation
Kevin Cecco, Statistics of Income Division, Internal Revenue Service
John Haltiwanger, Department of Economics, University of Maryland
Mark Harris, National Agricultural Statistics Service, USDA (member, ICSP working group on innovation)
Brian Harris-Kojetin, Statistical and Science Policy Office, Office of Management and Budget
Michael Horrigan, Bureau of Labor Statistics
Graham Kalton, Westat
Jennifer Madans, National Center for Health Statistics
Thomas Mesenbourg, U.S. Census Bureau
Sally Morton, Graduate School of Public Health, University of Pittsburgh
Richard Newell, Energy Information Administration
Barry Nussbaum, Office of Environmental Information, U.S. Environmental Protection Agency
Marilyn Seastrom, National Center for Education Statistics

Michael Sinclair, Bureau of Justice Statistics
Alan Zaslavsky, Department of Health Care Policy, Harvard Medical School

10:00 **Session II: Scope of the Innovation Problem in Federal Statistics**
Chair: Thomas Louis, Johns Hopkins School of Public Health
Discussants: See list for Session I

12:00 pm *Lunch*

1:00 **Session III: Barriers to Innovation and Possible Remedies**
Chair: Lawrence Brown, The Wharton School, University of Pennsylvania
Discussants:
David Banks, Department of Statistical Science, Duke University
Cynthia Clark, National Agricultural Statistics Service, USDA
Manuel de la Puente, Office of Research, Evaluation, and Statistics, USDA
Steven Dillingham, Bureau of Transportation Statistics
Emerson Elliott, National Council for Accreditation of Teacher Education
John Eltinge, Bureau of Labor Statistics (member, ICSP working group on innovation)
Ivan Fellegi, Statistics Canada (emeritus)
Robert Groves, U.S. Census Bureau
Stuart Kerachsky, National Center for Education Statistics
J. Steven Landefeld, Bureau of Economic Analysis
Roderick J.A. Little, Department of Biostatistics, University of Michigan
E.J. Reedy, Ewing Marion Kauffman Foundation
Allen Schirm, Mathematica Policy Research, Inc.
Ed Spar, Council of Professional Associations on Federal Statistics
John Thompson, National Opinion Research Center at the University of Chicago
Katherine Wallman, Statistical and Science Policy Office, OMB

3:00 *Break*

3:30 **Session IV: Next Steps**
Chair: Katherine Wallman, Statistical and Science Policy Office, OMB
Panelists:
Lawrence Brown, The Wharton School, University of Pennsylvania
Thomas Louis, Johns Hopkins School of Public Health
Edward Sondik, National Center for Health Statistics
General Discussion among discussants from previous session

4:30 **Concluding Comments**—Thomas Louis and Constance Citro

5:00 Adjourn

Appendix B

Workshop Attendees[1]

Heibatollah Baghi, George Mason University
David Banks, Department of Statistical Science, Duke University
Daniel Beckler, National Agricultural Statistics Service, U.S. Department of Agriculture
Vladislav Beresovsky, National Center for Health Statistics
Ron Bianchi, Economic Research Service, U.S. Department of Agriculture
Dara Blachman, Federal Interagency Forum on Child and Family Statistics
Chet Bowie, National Opinion Research Center at the University of Chicago
Norman Bradburn, National Opinion Research Center at the University of Chicago
Lawrence Brown, The Wharton School, University of Pennsylvania
Stephanie Brown, Energy Information Administration
Paul Bugg, Statistical and Science Policy Office, Office of Management and Budget
Verita Buie, National Center for Health Statistics
Maria Fe Caces, Office of National Drug Control Policy, Office of Management and Budget
Virginia Cain, National Center for Health Statistics

[1]Affiliations are as of the time of the workshop (June 2010).

Lynda Carlson, National Center for Science and Engineering Statistics, National Science Foundation
Christopher Carroll, Council of Economic Advisers
Kevin Cecco, Statistics of Income Division, Internal Revenue Service
Korrine Chiu, U.S. Government Accountability Office
Asaph Young Chun, National Opinion Research Center at the University of Chicago
Kristen Cibelli, Office of Management and Budget
Constance Citro, Committee on National Statistics, National Research Council
Cynthia Clark, National Agricultural Statistics Service, U.S. Department of Agriculture
Michael P. Cohen, Bureau of Transportation Statistics (retired)
Steven Cohen, Agency for Healthcare Research and Quality
Lawrence Cox, National Institute of Statistical Sciences
Darryl Creel, RTI International
Frank (Les) Davis, Information Policy, Census, and National Archives Subcommittee, U.S. House of Representatives
William Davis, Social Security Administration
Manuel de la Puente, Office of Research, Evaluation, and Statistics, Social Security Administration
Kevin Deardorff, U.S. Census Bureau
Marshall DeBerry, U.S. Department of Transportation
Steven Dillingham, Bureau of Transportation Statistics
Ben Duffy, U.S. Census Bureau
Cheryl Eavey, Methodology, Measurement, and Statistics Program, National Science Foundation
Emerson Elliott, National Council for Accreditation of Teacher Education
John Eltinge, Bureau of Labor Statistics
Suzann Evinger, Statistical and Science Policy Office, Office of Management and Budget
Trena Ezzati-Rice, Agency for Healthcare Research and Quality
Robert Fay, Westat
Elena Fazio, National Center for Health Statistics
Ron Fecso, U.S. Government Accountability Office
Ivan Fellegi, Statistics Canada (emeritus)
Dennis Fixler, Bureau of Economic Analysis
Joe Garrett, Knowledge Networks
Peter Gibson, U.S. Census Bureau
Nancy Gordon, U.S. Census Bureau
Deborah Griffin, U.S. Census Bureau
Robert Groves, U.S. Census Bureau

Hermann Habermann, Committee on National Statistics, National Research Council
John Haltiwanger, Department of Economics, University of Maryland
Mark Harris, National Agricultural Statistics Service, U.S. Department of Agriculture
Brian Harris-Kojetin, Statistical and Science Policy Office, Office of Management and Budget
Ted Horan, Social Security Administration
Michael Horrigan, Bureau of Labor Statistics
Eva Jacobs, Bureau of Labor Statistics (retired)
Donsig Jang, Mathematica Policy Research, Inc.
Matt Jans, U.S. Census Bureau
Ron Jarmin, U.S. Census Bureau
Peter Jennings, Towson University
Graham Kalton, Westat
Alan Karr, National Institute of Statistical Sciences
Courtney Kennedy, Abt SRBI
Stuart Kerachsky, National Center for Education Statistics
Ruth Ann Killion, U.S. Census Bureau
Ellen Kramarow, National Center for Health Statistics
Karol Krotki, RTI International
J. Steven Landefeld, Bureau of Economic Analysis
Cheryl Landman, U.S. Census Bureau
Michael Larsen, George Washington University
Michael Lawrence, Biostatistics Center, Knowledge Networks
Daniel Levine, Westat
Roderick J.A. Little, Department of Biostatistics, University of Michigan
Thomas Louis, Johns Hopkins School of Public Health and Workshop Chair
Jennifer Madans, National Center for Health Statistics
Shelly Martinez, Statistical and Science Policy Office, Office of Management and Budget
Krisztina Marton, Committee on National Statistics, National Research Council
Linda McCaw, Social Security Administration
Pauline Mendola, National Center for Health Statistics
Thomas Mesenbourg, U.S. Census Bureau
Peter Meyer, Bureau of Labor Statistics
Albertha Mitchell, Social Security Administration
Susan Mitchell, RTI International
Dagmara Mocala, Council of Economic Advisers
Mary Moien, National Center for Health Statistics

Francisco Moris, National Center for Science and Engineering Statistics, National Science Foundation
Rebecca Morrison, U.S. Census Bureau
Sally Morton, Graduate School of Public Health, University of Pittsburgh
Jeri Mulrow, National Center for Science and Engineering Statistics, National Science Foundation
Richard Newell, Energy Information Administration
Terry Nuriddin, Statistics of Income, Internal Revenue Service
Barry Nussbaum, Office of Environmental Information, U.S. Environmental Protection Agency
Barbara O'Hare, U.S. Census Bureau
William O'Hare, Annie E. Casey Foundation
Maria Owings, National Center for Health Statistics
Jennifer Park, National Institutes of Health
Jennifer Parker, National Center for Health Statistics
Robert Parker, Consultant
Tom Petska, Statistics of Income, Internal Revenue Service (retired)
Steve Pierson, American Statistical Association
Adrienne Pilot, Council of Economic Advisers
Michael Planty, Bureau of Justice Statistics
Ricky Rambharat, U.S. Department of Treasury
Barbara Rawdon, U.S. Department of Commerce
Andrew Reamer, Brookings Institution
E.J. Reedy, Ewing Marion Kauffman Foundation
Ed Robison, Bureau of Labor Statistics
Judith Rowe, Princeton University (retired)
Adam Safir, Bureau of Labor Statistics
Robert Sands, U.S. Census Bureau
Susan Schechter, U.S. Census Bureau
Nathaniel Schenker, National Center for Health Statistics
Allen Schirm, Mathematica Policy Research, Inc.
Kathleen Scholl, U.S. Government Accountability Office
Marilyn Seastrom, National Center for Education Statistics
Stephanie Shipp, Science and Technology Policy Institute
Howard Silver, Consortium of Social Science Associations
Michael Sinclair, Bureau of Justice Statistics
Darius Singpurwalla, Science and Technology Policy Institute
Monroe Sirken, National Center for Health Statistics
Edward Sondik, National Center for Health Statistics
Edward Spar, Council of Professional Associations on Federal Statistics
Tiffani St. Cloud, Association of American Medical Colleges
Marie Stetser, Office of Management and Budget

Miron Straf, Division of Behavioral and Social Sciences and Education, National Research Council
Jennifer Tancreto, U.S. Census Bureau
Gloria Terrell, National Agricultural Statistics Service, U.S. Department of Agriculture
John Thompson, National Opinion Research Center at the University of Chicago
Clyde Tucker, Bureau of Labor Statistics
Ritu Tuteja, National Center for Health Statistics
Katherine Wallman, Statistical and Science Policy Office, Office of Management and Budget
Shawna Waugh, Energy Information Administration
Michael Weber, Statistics of Income, Internal Revenue Service
Daniel Weinberg, U.S. Census Bureau
Jennifer Whitaker, U.S. Census Bureau
Andrew White, National Center for Education Statistics
Adeline Wilcox, Department of Veterans Affairs
Diane Willimack, U.S. Census Bureau
Gooloo Wunderlich, Committee on National Statistics, National Research Council
Mandi Yu, National Institutes of Health

COMMITTEE ON NATIONAL STATISTICS

The Committee on National Statistics (CNSTAT) was established in 1972 at the National Academies to improve the statistical methods and information on which public policy decisions are based. The committee carries out studies, workshops, and other activities to foster better measures and fuller understanding of the economy, the environment, public health, crime, education, immigration, poverty, welfare, and other public policy issues. It also evaluates ongoing statistical programs and tracks the statistical policy and coordinating activities of the federal government, serving a unique role at the intersection of statistics and public policy. The committee's work is supported by a consortium of federal agencies through a National Science Foundation grant.