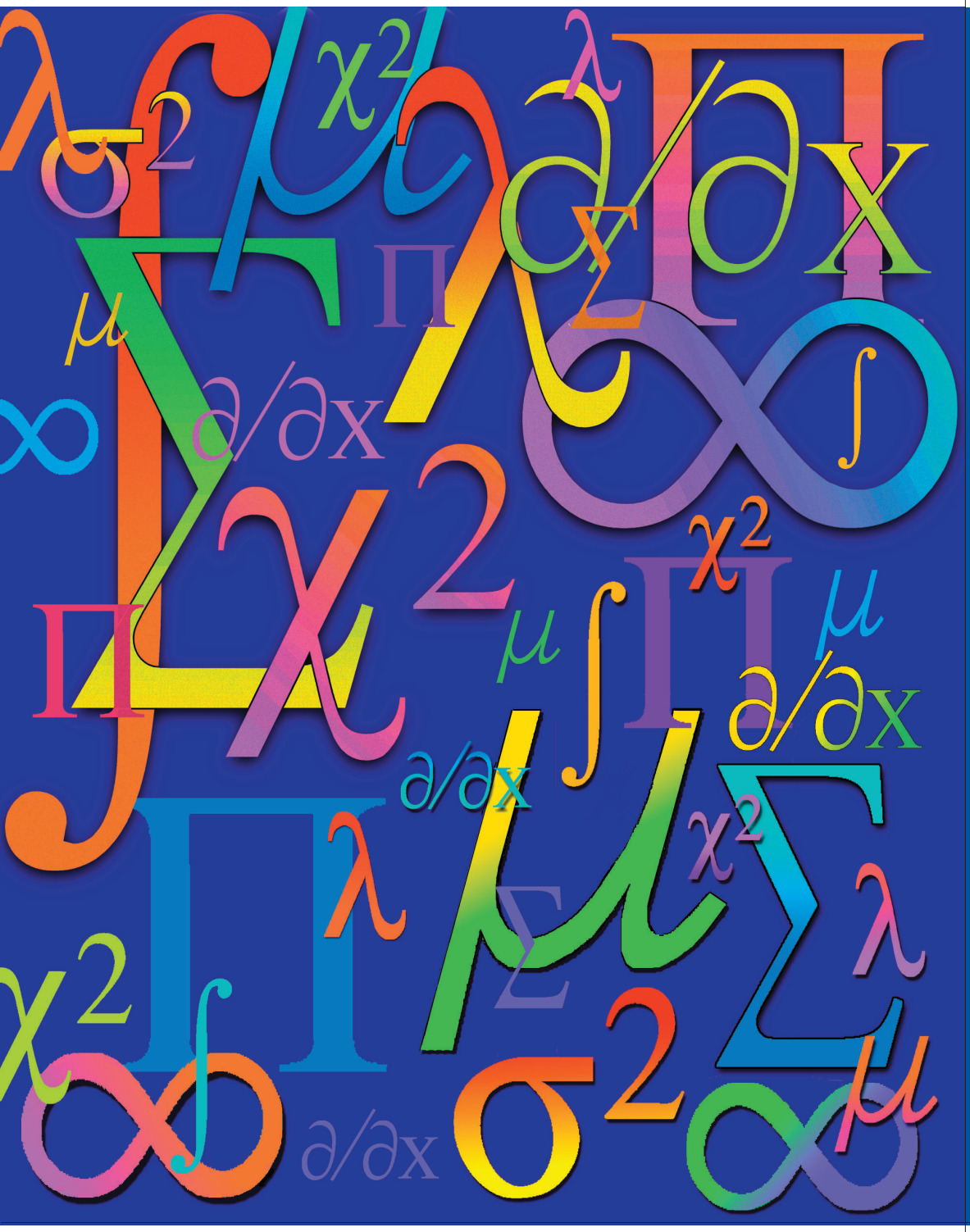
Research Opportunities at the Census Bureau

The ASA/NSF/Census Bureau Research Fellow Program

Issued August 2002

DIR/01-RFP (Revised)



U S C E N S U S B U R E A U

Helping You Make Informed Decisions

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU

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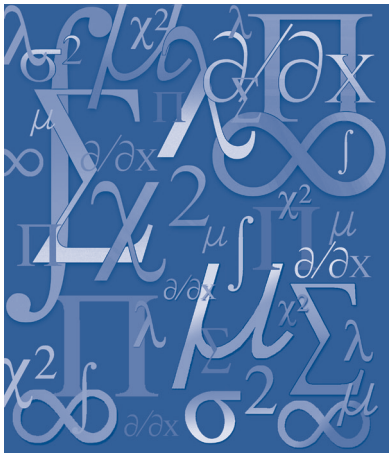

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Donald L. Evans,
Secretary

Economics and Statistics Administration
Kathleen B. Cooper,
Under Secretary for
Economic Affairs

U.S. CENSUS BUREAU
Charles Louis Kincannon,
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ASA/NSF/Census Bureau Research Fellow Program

Program Description

The ASA/NSF/Census Bureau Research Fellow Program will help to bridge the gap between government and academic science. This approach brings researchers closer to the production of the data sets relevant to their research. The program allows senior statisticians, social scientists, computer scientists, geographers, and others to come to the Census Bureau as Research Fellows for a period of 6 to 12 months to use Census Bureau data sets and interact with Census Bureau staff.

Applicants for fellowships should have recognized research records and considerable expertise in their areas of proposed research. The proposed projects may be in any area related to Census Bureau methodology or data. Research topics of interest to the Census Bureau are cited in this brochure.

We also encourage proposals in other areas relevant to Census Bureau data or methodology. Applicants must submit detailed research proposals for competitive evaluation. A Program Review Board composed of staff from the Census Bureau and members of academic associations relevant to the areas of research review the applications and select the Fellows for the program.

We encourage researchers to seek further support from the National Science Foundation (NSF) for their work begun under, or stimulated by, the research program. Such support requires applying to NSF for a regular project grant. Information about procedures for submitting proposals to NSF should be requested soon after entering the research program. If such continuing research is funded, it may continue at the Census Bureau or at an academic or supporting institution.

See Administrative Information for the application procedure.

Direct questions about fellowships or research topics to any of the following program representatives at the Census Bureau, Washington, DC 20233.

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About the Census Bureau

The Census Bureau is the largest general-purpose statistical agency in the United States. By conducting censuses and surveys of households, individuals, business firms, and governments, the Census Bureau produces demographic and economic statistics. These statistics count and profile the people and institutions of the United States and their interaction with the rest of the world. Specifically, the Census Bureau conducts censuses and sample surveys in the areas of population, housing, manufactures, business (wholesale trade, retail trade, and services), mineral industries, construction, finance, transportation, governments, and foreign trade.

The Census Bureau produces data for publication and use by other government agencies. By conducting surveys for other government agencies, the Census Bureau actually collects and tabulates much of the data these agencies publish. Examples include the American Housing Survey for the Department of Housing and Urban Development, the National Crime Victimization Survey for the Department of Justice, the Manufacturing Energy Consumption Survey for the Department of Energy, and the Consumer Expenditure Survey for the Department of Labor. In addition, the Census Bureau makes extensive use of other federal agencies' administrative records in compiling its statistical data. The Census Bureau has garnered the reputation as the "Factfinder for the Nation." The annual *Census Catalog and Guide* is the best reference on the Census Bureau's programs. This reference contains a product overview and index, abstracts of products released since 1980, ordering information and forms, lists of sources of assistance, and an informative series of facts on Census Bureau programs. The publication is available in local libraries and from the Customer Service Center, Marketing Services Office, Census Bureau, Washington, DC 20233-1900, 301-763-4636.

The Census Bureau conducts its own methodological and subject-matter research aimed at improving its data production programs. Current broad research areas include statistical standards, survey design and estimation, evaluation and quality assurance, confidentiality, nonsampling errors, automation, data analysis, time series analysis, statistical computing, and organizational research.

Advantages of This Program

By conducting research projects at the Census Bureau, the researchers have a unique opportunity to make major advances in methodology and applications in many areas. These areas include, but are not limited to, the suggested projects discussed in this brochure. This opportunity is unique for three reasons: (1) researchers become special sworn Census Bureau employees; (2) researchers can work directly with Census Bureau staff who are most familiar with the data and with methods of producing the data; and (3) researchers have the opportunity to become more familiar with federal statistical agencies and resources in the Washington area. The status of a special sworn Census Bureau employee gives the researchers access to survey microdata that regular Census Bureau employees have. This is particularly advantageous as microdata are not generally released because of the legal requirement to protect respondent confidentiality. Researchers have the same responsibility as employees to protect the confidentiality of Census Bureau data.

Suggested Projects

Suggested projects are listed under three headings reflecting the organization of the Census Bureau: social and demographic studies, economic measurement and analysis, and statistical methodology and computing. Proposed projects may fall into more than one category and are not limited to those listed here. Any proposed project should have the potential to encourage further significant broadly based research and

should require hands-on access to Census Bureau data. We welcome projects that could lead to improvements in the quality and usefulness of our data.

Social and Demographic Studies

Projects in this area concern Census Bureau surveys and censuses of households and individuals.

Decennial Census Undercount Research. Much discussion in the legal, political, and statistical communities concerns estimating the undercount in the census. We are soliciting proposals to investigate the following issues:

- How census coverage can best be measured?
- How local area estimates of coverage can best be made?
- How census coverage might affect critical uses of the data?

Survey of Income and Program Participation (SIPP). The SIPP is a series of nationally representative panels of the noninstitutionalized population. To date, there have been ten panels introduced annually; each panel typically remains in the survey for 2 1/2 years. In 1996, a new panel was introduced to last 4 years. Each SIPP panel provides detailed information through personal interviews at 4-month intervals. The information contains intrayear sources of money and nonmoney income, taxes, assets, and liabilities. Information is also collected on special topics, such as education and work history, health and disability, fertility, migration, and employer-provided benefits.

Research Fellows may use SIPP data for conceptual, methodological, or applied studies on large longitudinal social science databases. One particularly useful approach might be to match contextual variables to the local geography. Some principal areas of research interest include the following:

- Sources of, and reasons for, intrayear changes in income, assets, and program participation.
- Methods to compensate for attrition and nonresponse.
- Stochastic modeling of events, such as movement into and out of poverty.
- Measurement of the dynamics of household and family composition and how they relate to program participation and poverty status.

The American Community Survey (ACS). The ACS is being tested as an eventual replacement for the census long form. Starting in 2003, the ACS will sample 250,000 different addresses each month, providing detailed demographic and social data for geographic areas and population groups. Between now and 2003, there is ongoing testing and evaluation of the ACS, including detailed comparisons of 1999-2001 ACS averages with the Census 2000 estimates. Areas of research interest include:

- Methods for analyzing moving averages, including uses in formulas to allocate funds according to measures of need.
- Statistical modeling of effects on survey data due to differences in questionnaires and residence definitions.
- Models to estimate survey costs and optimize survey operations.

Analysis and Evaluation of Housing Statistics. Statistics on housing are available from the decennial census and from several periodic national surveys. We welcome proposals for applied studies using these data and for the following projects that are of particular interest:

- Use of modeling to help improve estimates of households' utility costs.
- Evaluation of data items on the quality and value of housing.
- Research to explain consistent differences, across censuses and surveys, in the numbers of owner-occupied housing units and rented units.

- Design of a sampling frame to estimate additions to the housing stock from sources other than new construction.

- Development of county-level estimates of the number of housing units.

Intercensal Population Estimates and Population Projections. This project develops, produces, and disseminates population estimates and projections by major demographic characteristics for the nation, states, counties, and sub-county areas in a timely fashion. Population estimates are produced using the last census data as the base, and current administrative records, such as births, deaths, federal tax returns, medicare enrollment, immigration, etc., for changes since the last census. Population projections are estimates for future dates and illustrate plausible courses of future population change based on assumptions about future births, deaths, international migration, and internal migration.

Projects in this area could include a wide variety of topics:

- Exact matching techniques for administrative data sets.

- Geographic coding procedures to match mailing address information to census geography.

- Methods of correcting for biased coverage of administrative records.

- Methods for expanding the level of geographic and characteristic detail in Census Bureau estimates.

- Procedures for combining short- and long-term population projection models.

- Methods of estimating and presenting multiple projections scenarios versus forecast intervals.

- Application of time series methods to population projections.

- Combination of demographic and economic methods in population projections.

- Development of current measures of the various components of international migration, including measures of unauthorized and temporary migration and emigration.

Small Area Income and Poverty Estimates. The Census Bureau has begun a program to provide a biennial series of estimates of six statistics of income and poverty—per capita income, median household income, and the number of persons below the poverty threshold for four age groups (age 65 and over, age 5-17, under 5 years of age, and all ages)—for states and counties. County-level estimates have been issued for income years 1993, 1995, and 1997, and state-level estimates for years 1993, 1995, 1996, and 1997. State-level estimates will be issued for income year 1998 in 2001, and county-level estimates for income year 1999 in late 2002. Estimates are based on models combining decennial census estimates, direct sample estimates, and federal administrative data. Projects in this area could include:

- Investigations relating concurrent measurements of basic income and poverty statistics from any pair of sources—the decennial census and current surveys, the census and administrative records, or current surveys and administrative records.

- Optimal methods for combining "symptomatic indicators"; e.g., number of food stamp recipients, with more direct measures of income and poverty.

- Validation studies.

Research is also needed on methodological topics including: using of mixed Generalized Linear Models to address the discreteness of the county poverty data; developing better ways to integrate the state and county models; improving estimates of mean squared error for the model-based estimates; assessing alternative ways of incorporating 2000 census data into the models; and developing and assessing alternative procedures, and possibly models, for the school district estimation.

Estimation and Analysis of Biases and Errors in Demographic Estimates. From a demographic or statistical perspective, Research Fellows would investigate ways to improve Census Bureau postcensus demographic estimates. These data include estimates of population by age, race, and sex for national and subnational geographic areas. Research would center on gaining a better understanding of biases in the current estimation methods, specifying new methods to reduce these biases, and estimating error variances of the methods. Sample topics include the following:

- Investigation of possible basic deficiencies in the Census Bureau's handling of demographic accounts for estimates (especially the international migration component), such as whether the demographic components are adequately measured or estimated or whether better estimation procedures can be devised using other indicator variables or relationships than are now used.

- Use of statistical or simulation methods to quantify biases in demographic estimates and the sensitivity of the estimation methods to changes in their underlying assumptions.

Adjusting for Nonsampling Errors in Income Surveys. Income statistics derived from Survey of Income and Program Participation and the March Current Population Survey are subject to nonsampling error problems. These errors affect the accuracy of our measures of income inequality, estimates of the low- income population, and estimates of participation in government transfer programs. The researcher would develop profiles of the level and characteristics of the nonsampling error for specific income types and would investigate alternative procedures for adjusting the survey data at the microlevel to reduce the magnitude of these errors.

Coverage Evaluation in Demographic Surveys. Undercoverage in demographic surveys is much higher than in the decennial census, and it varies across demographic groups. For example, the estimate for undercoverage is more than 15 percent for Black males and is even greater for young Black males in the Current Population Survey. Research could focus on:

- Reasons for greater undercoverage in surveys than in the census.

- Types of people missed in surveys who are not missed in the census.

- Coverage comparisons among different Census Bureau surveys or between Census Bureau surveys and those of other countries.

- Field tests of methods that may improve coverage.

Valuation of Noncash Benefits. Noncash benefits have become an increasingly important component of economic well-being in the United States. These benefits are received by households all along the income distribution, ranging from means-tested transfer provided by the government to various fringe benefits provided by employers. Although extensive survey information is available on the recipiency of these benefits, much more work is needed to assign dollar values to them. Extensive work has been done at the Census Bureau to value the major government-provided benefits, such as food stamps, free or reduced-price school lunches, public housing, medicaid, and medicare. Additional work is needed, however, to refine these estimates, particularly for medical care. Work is also underway for valuing employer-provided benefits, such as contributions for health care and pensions, but much more effort is needed. Such privately provided benefits are much more difficult to value than government-provided benefits because they come in so many different forms, and independent administrative data are often scarce. The researcher could develop methodologies to produce and refine estimates of noncash benefits, assess the accuracy of these estimates, and examine the effect on measures of income distribution and poverty.

Analysis of Special Population Groups. The Census Bureau conducts research on a wide array of population groups for whom the agency collects data in its current surveys and in the decennial census. Among these groups are those identified in questions on age, gender, race, Hispanic origin, ancestry, place of birth, citizenship, and year of entry. One key focus is on the five standard Office of Management and Budget racial categories (White, Black or African American, American Indian and Alaska Native,

Asian, and Native Hawaiian and Other Pacific Islander), the Hispanic population, and the foreign-born population. In addition, there is considerable interest in issues affecting the population by gender and also for particular age groups, especially the older population. Finally, there is increasing interest in the population that resides transiently or not at all in households, including some components of the institutionalized population (e.g., prisons and jail inmates), group quarters population (e.g., shelter residents), as well as the population with no usual residence. Some of the salient research issues in this subject-matter area are:

- Reasons for persistently greater undercoverage in surveys and the census among certain population groups (e.g., Blacks or African Americans, American Indians and Alaska Natives, Hispanics, and the foreign born).
- Methods for improving coverage among persistently undercounted groups.
- Social, economic, and demographic differentials among population groups.
- Cultural changes and differences that affect questionnaire design and survey procedures.
- Changing living arrangements occurring in today's society.

International Demographic and Socioeconomic Analysis. The Census Bureau has working relationships and information exchange programs with many national statistical offices around the world and therefore has a wealth of international statistics, including a 100,000 volume international library. It produces population estimates and projections for all countries of the world and makes these data available in a database on the Internet. Areas of interest include:

- Demographic methods for incomplete and defective data.
- Population projection methods for subnational areas.
- International demographic and socioeconomic aspects of population aging.
- The demographic impact of HIV/AIDS in developing countries.
- Building geodemographic databases and analyses.
- Social, demographic, and economic trends in post-Soviet Eastern and Central Europe.

Economic Measurement and Analysis

Projects in this area concern censuses and surveys of business establishments, firms, and public sector agencies. General areas of interest include the following:

- Conceptual and empirical issues in the measurement of economic and related variables.
- Procedures for assessing the accuracy and improving the measurement of economic variables.
- Development and application of appropriate economic and econometric frameworks for analyzing detailed Census Bureau data for businesses and other economic entities.
- Analysis of changes in federal, state, and local fiscal responsibility for providing services.
- Survey implications measuring e-business and other new economy issues.
- Survey implications of the introduction of the North American Industry Classification System and the revised Standard Occupational Classification.
- Exploration of forecasting and policy uses of Census Bureau data at the national and regional levels.

- Topics of particular interest are noted below, but we encourage proposals in other areas.

Analysis of Establishment and Firm Data. The Longitudinal Research Database (LRD) is available for econometric studies of establishments and firms. The LRD contains annual data from 1972 to the most recently completed survey year, covering over 350,000 manufacturing establishments in census years and from 55,000 to 70,000 in noncensus years. The microdata in the files are confidential, which precludes direct use except by sworn Census Bureau employees, including Research Fellows and Census Bureau Scholars. Together with data from other surveys (e.g., Research and Development, Capacity Utilization, Pollution Abatement), the LRD enables researchers to conduct a wide range of economic and econometric time series and cross-section studies of individual establishments and groups of establishments. The data are well suited for econometric studies of production relationships and industrial organization studies.

Econometric studies of production relationships, such as:

- Production and cost models.
- Interrelated factor demand analyses.
- Technical change, productivity, and efficiency.
- Economies of scale and scope.
- Input and output measurement.

Industrial organization studies, such as:

- Entry and exit of firms.
- Mergers and acquisition.
- Relationship between firm size and employment dynamics.
- Effects of technical change on market structure.

Analysis of Research and Development Activity. The Census Bureau conducts an annual survey of research and development (R&D) expenditures by major R&D performing and sponsoring companies. Both cross-section and time series studies can be conducted using company-level files containing data from 1972. These data contain a wide range of information on firm R&D, including expenditures by type, location, and industry. These data permit researchers to address a wide range of important R&D-related economic measurement and policy issues. Some examples are:

- R&D in relation to productivity.
- Innovation and its diffusion.
- Demand for scientists and engineers.
- Capital formation and R&D.

Economic Measurement and Analysis in the Service Sectors. The Census Bureau is expanding industry coverage and the types of data collected for these sectors, especially telecommunication, real estate and finance, transportation, and various business services, such as advertising, accounting, and legal services. We welcome proposals on the following topics:

- Output measurement and deflation (particularly in multiple-output or multiple-characteristics frameworks).
- Input definition and measurement, technological change.
- Capital input measurement, depreciation, and obsolescence.
- Economies of scale and scope.
- Conceptual framework for product classification system for services.
- Market share definition, stability, and trends.

Construction Cost and Output Indexes. Indexes used by the Census Bureau to deflate the value of new nonresidential construction put in place have been inadequate. Research to develop a new indexing program would involve development of cost models for different types of nonresidential construction, such as industrial, commercial, and medical; a review of current program data for application to cost models; and recommendations for additional

data collection to support improved index methods.

Small Business Entrepreneurship: The Characteristics of Business Owners (CBO) Survey. This survey is sponsored by the Census Bureau, the Minority Business Development Agency, and the Small Business Administration. The survey presents data about the demographic, sociological, and financial characteristics of minority- and women-owned businesses, as well as a comparable nonminority male business universe. The data from this sample survey were collected as part of the economic censuses and are intended to expand and augment the data published in two economic censuses reports—the Survey of Women-Owned Business Enterprises and the Survey of Minority-Owned Business Enterprises. Research Fellows will have access to the microdata from the CBO survey (covering 125,000 business owners and their enterprises in each of 1982, 1987, and 1992). These data are particularly suited to studies of minority small business entrepreneurship.

Improving Merchandise Trade Statistics. The Census Bureau is responsible for compiling detailed U.S. merchandise trade statistics, using documents collected by the Customs Service, Department of the Treasury. In recent years, increasing concern has developed about the economic effects of foreign trade, resulting in criticism of the scope, accuracy, and timeliness of the available data on trade.

We welcome research proposals that may lead to improved estimates, especially in the following areas:

- Determining what trade information is likely to be most in demand and require the greatest accuracy in the coming decades, and suggesting changes in the existing data system to provide this information.
- Improving data collection, data processing, estimates of low-valued transactions, and quality assurance through such means as introducing sampling into the collection process and increasing the use of automation.
- Improving monthly real (deflated) estimates of merchandise trade flows.
- Evaluating the coverage of the merchandise trade statistics, particularly for exports.
- Evaluating the impact of the new Automated Export System on the coverage, accuracy, and consistency of the trade data.
- Evaluating the interpretation, quality, coverage, and consistency of the subnational trade data, such as by state or metropolitan area.

Measurement of Capital Investment in Economic Surveys. The Census Bureau measures capital investment in a variety of ways in its economic survey programs. A primary use for these data is in the nonresidential fixed investment component of the Gross Domestic Product. Conceptually, these data are not completely consistent with each other or with the Gross National Product investment definition. The Census Bureau welcomes proposals that would help provide greater standardization and consistency among these measures of capital investment. A related issue is the improvement of measures of capital stocks, taking into account such factors as the economic life of capital goods and the sensitivity of capital stocks to changes in technology and relative factor prices.

Microfoundations of Macroeconomics. Recently, researchers at the Census Bureau and elsewhere have begun to recognize that understanding aggregate (macroeconomic) fluctuations requires studying the behavior of individual plants and firms. For example, studies using data from the Longitudinal Research Database show that when economic conditions change, plants' and firms' adjustments in employment and investment are often lumpy (not smooth) and that such microeconomic reallocation and restructuring has macroeconomic effects. The currently available macroeconomic time series often mask these effects. Further, some researchers suggest that our understanding of aggregate fluctuations could be enhanced if certain new aggregate measures were made available—based on the higher moments (e.g., skewness, kurtosis) of the cross-section distributions of variables, such as investment and employment. Research proposals in this new research area are particularly welcome.

E-Business Measurements. The integration of information, communication, and computer technology opens new purchasing channels to consumers and provides firms with the opportunity to fundamentally change the way they operate and conduct their business. The Economic Directorate has an ambitious program underway that provides the first official government estimates of e-commerce sales and e-business process use. Research is underway to better understand the impact of e-business processes on industries, companies, and our programs. The research includes such areas as:

- Measuring and analyzing e-business processes.
- Designing surveys of the supply chain, based on recent research on how e-business processes are changing supply chain relationships and functions.
- Surveying e-business activities of government entities.
- The impact of electronic distribution and delivery of products on the nation's foreign trade statistics program.

Statistical Methodology and Computing

This area includes research that is not necessarily tied to particular Census Bureau data sets, but has broad application to the collection, processing, or analysis of Census Bureau data. Survey methodology and related areas are of particular interest, along with any other research topics that may lead to improved data quality and reduced costs.

Survey Methodology. The Census Bureau is interested in projects dealing with any aspect of survey methodology, which (for purposes of this brochure) encompass all the steps taken in conducting a survey or a census:

- Determining survey objectives.
- Defining the target population.
- Selecting the frame (or frames).
- Designing the sample.
- Choosing the method of measurement (e.g., personal or telephone interviews, or mailed questionnaires).
- Selecting the information to be obtained and the questions to be asked.
- Selecting and training interviewers and other field workers.
- Conducting pretests.
- Organizing the fieldwork.
- Organizing data management (data processing and quality control).
- Data analysis, particularly of longitudinal data.

These items are of continuing interest to the Census Bureau because the Census Bureau is continually developing and redesigning its surveys and censuses. Many of the Census Bureau's demographic surveys (of households and individuals) are redesigned around the time of the decennial census, and many of the economic surveys (of business establishments and firms) are redesigned around the time of the various economic censuses which are conducted in years ending in "2" and "7." Many of the projects below and those in other sections of this brochure relate to particular problems of survey methodology.

The Adjustment for Nonresponse in Sample Surveys and Censuses. Research in this area would be aimed at improving data quality by:

- Developing data collection procedures that reduce nonresponse (e.g., through improved questionnaire design, training in interviewing techniques, etc.).
- Exploring and evaluating new or existing techniques for reducing nonresponse bias in estimates.

Quality Improvement and Its Measurement. The Census Bureau encourages proposals for ways to apply a wide range of quality improvement methods to a variety of Census Bureau operations, including interviewing and data processing. Researchers could investigate such topics as the following:

- Methods to objectively estimate costs to users of various kinds of errors in Census Bureau data (loss functions).
- Integrated overall error models, with provisions for estimating magnitudes of relationships among various error sources.
- Methods of adapting evolutionary operations techniques to various Census Bureau operations, especially controlled experiments under operating conditions.
- Ways to measure how quality and productivity relate to factors, such as alternative organizational structures, or presumed morale builders, such as quality circles.
- Effective patterns of quality control feedback, training, and incentives for enumerators and managers that would be applicable to large economic or demographic censuses and surveys.
- Ways to report to users most usefully and objectively the levels and relationships of errors.

Cognitive Processes and Question Response. The construction of questions and questionnaires is frequently described as an "art" or "craft." Survey methodologists have studied such issues as the effects of question placement within a questionnaire and the tendency of respondents to recall events as happening more recently or more distantly than they actually occurred. Proposals are sought from those who would use the methods of the cognitive sciences to improve the understanding of such questionnaire construction issues as question order, the choice of vocabulary in a question, the choice of response categories, and response analysis studies of questionnaires. The topic offers cognitive and other social scientists the opportunity to use Census Bureau surveys to extend laboratory-based theories of the way in which people comprehend, store, and retrieve information, make judgments and causal inferences, and respond to questions.

Telephone Survey Methods. In anticipation of the increasing use of centralized telephone interviewing in data collection, the Census Bureau has conducted experiments with Computer-Assisted Telephone Interviewing (CATI) and Random Digit Dialing (RDD) telephone sampling. In addition, the Census Bureau has investigated dual-frame mixed mode sampling designs. Developmental and evaluative research topics in this area include the following:

- Modeling and estimation of telephone survey nonsampling error.
- Comparison of CATI and conventional interviewing in terms of data quality, costs, and estimates produced.
- Touchtone data entry and voice recognition.
- Cost modeling of new and conventional collection methods and minimization of survey costs.
- Improving the efficiency of RDD, list-assisted, and related telephone sampling methods.
- Optimum allocation of resources in dual-frame sampling designs, taking both sampling and nonsampling errors into account.

Confidentiality Protection and Related Topics. Statistical confidentiality deals with the problem of releasing statistical data that are as accurate and complete as possible while avoiding disclosure of information collected from individual respondents. We welcome proposals that would supplement the Census Bureau's research in the following topics:

- Masking and microaggregation techniques.
- Rounding and other perturbation techniques for frequency counts.
- Cell suppression strategies for aggregate data based on mathematical programming formulations.

- Development of suitable measures of disclosure risk and the effects of disclosure-avoidance methods on data usefulness.

Related areas of interest for proposals include:

- Development of public use files of economic microdata (see Developing Public Use Files of Economic Microdata above).

- Statistical database security.

- Methods to assess and improve or maintain public attitudes about confidentiality in federal statistical programs.

Small Area Estimation. The Census Bureau has broad interests in research into statistical methods for small area estimation with application to Census Bureau surveys. One important application is the Small Area Income and Poverty Estimates program, discussed earlier under Social and Demographic Studies. Other areas of potential application include the American Community Survey and small area coverage estimation for the decennial census. Research interests cover a wide range of small area topics relevant to models of survey aggregates or to unit level models.

Census Coverage Estimation. The Census Bureau has had a long term commitment to continually improve the coverage of the decennial census. A critical component of an ongoing research effort is to obtain new and improved measurements of census coverage. For Census 2000, the Accuracy and Coverage Evaluation (A.C.E.) provides an independent assessment of census coverage. The methodology, known as dual-system estimation, is based on the capture/recapture technique to estimate net coverage error. Continued research is needed to develop better estimators so that coverage properties of the decennial census can be better understood. In particular, more research is needed on better statistical methods to estimate the gross error components of census coverage for both housing units and persons. Additionally, research is necessary to determine how these errors are distributed to small geographic areas. Possible areas of exploration include developing enhanced missing data procedures, new post-strata, new models for estimating net or gross error, new models for small area estimates, or new models for joint coverage of persons and housing units. The A.C.E. provides a wealth of data for researchers to explore and analyze new techniques. Research is needed to develop innovative ideas that could improve the quality of the next decennial census.

Geographic Issues for Current Surveys. The Census Bureau publishes data for several subnational geographic units, such as states, regions, counties, and metropolitan areas. Many data users say that the Census Bureau should publish more data for different types of geographic units. Suggestions include types of settlement areas (e.g., neighborhoods, inner-city areas, or open countryside) or substantive types of places (e.g., expanding or declining housing markets). Research in this topic could focus on:

- What geographic units best measure various subnational social, economic, and demographic phenomena.

- How the Census Bureau can effectively incorporate such units into its survey programs to produce more useful subnational data.

Time Series Methods for Periodic Surveys. Research has shown that time series techniques can use both past and current data to produce improved current estimates for periodic surveys. Additional research is needed on practical problems that arise in applying these techniques, such as modeling the covariance structure over time of the sampling error, dealing with the effects of establishing benchmarks, and handling data problems, such as outliers, missing data, and changes in sample design or sample size. Investigation of the amount of improvement over conventional estimates that can be realized in practice is also needed.

Time Series Analysis. As a publisher of large numbers of economic and demographic time series, the Census Bureau has a strong interest in the development and application of time series methodology, and provides an excellent environment for research in this area. Areas of interest cover a broad range of topics in univariate and multivariate time series methodology and applications. Topics of particular interest include the following:

- Modeling and forecasting of demographic time series.
- Analysis of spatial data (such as state or county data).
- Methods of dealing with outliers in time series modeling and seasonal adjustment.
- Various topics in seasonal adjustment, including estimating error variances for seasonally adjusted data.
- Methods for modeling, forecasting, and seasonally adjusting large numbers of time series.

Statistical Computing and Graphics. The Census Bureau is conducting a research and development program to provide the most modern statistical computing support to its research and data analysis programs. The major subject areas in this research are statistical databases (including development of a statistical database for tabulating and analyzing data from Census Bureau surveys); statistical graphics (including use of color graphics); generalized statistical software, such as for data editing or record linkage, artificial intelligence; and software requirements for data analysis workstations for nonprogrammers. We welcome proposals that relate to one or more of these areas.

High-Speed Networking. The Census Bureau's network is one of the more advanced networks in the world. In keeping pace with emerging technologies, the Census Bureau has developed an architecture for audio, voice, video, and integrated data. Videoconferencing and internet protocol television are key components of this approach that also includes implementation of leading edge voice-over-internet protocol or internet protocol phones. It operates on Cisco Catalyst 6500 series gigabit capable switches and virtual LANS. It is a totally redundant network with no single points of failure. Asynchronous Transfer Mode 100 baseT and 10 baseT are all running over this network. This system gives us a cost-effective solution with modern functionality, voice mail scalability, and unified messaging, which allows integration with Lotus Notes. The Census Bureau is implementing a small scale pilot for telecommuting with plans to expand the opportunity to its employees.

The remote access system is protected by multiple firewalls and is one of the most secure in the federal government. The remote access system was converted from a Windows NT 4 domain-based authentication for remote access to RADIUS-based authentication using netware directory services. Storage has always been a critical element of any information technology organization, but now with the requirement to provide fast access and retrieval of data at anytime, it is imperative to have a well thought-out solution. The storage area network is being built to eventually handle up to thirty terabytes of data at any given time, day or night, which is beyond the capacity of many storage systems. Topics of particular research interest include the following:

- Voice-over-internet protocol expansion of internet protocol phones throughout the Census Bureau's area network.
- The integration of the remark voice mail system with Lotus Notes.
- Migration from NT4 to Windows 2000.
- Expansion of videoconferencing and internet protocol television video capability and storage of a minimum of three terabytes of video on the storage area network.
- A phased approach to manage Unix with e-directory for password synchronization.

Administrative Information

Conditions of Appointment and Benefits

Research Fellows and Census Bureau Scholars will conduct their research at the Census Bureau in Suitland, Maryland, a suburb of Washington, DC. While participating in the program, they are to follow normal Census Bureau policies and practices. The researchers are reimbursed by the ASA and are on a guest worker arrangement with the Census Bureau, or they are paid under the Intergovernmental Personnel Act (IPA).

The stipends received by researchers in this program are commensurate with their qualifications and experience. Fringe benefits and travel allowances are negotiable. Usually, the Census Bureau can negotiate retention of fringe benefits with the permanent employer.

The duration of the fellowship appointment is flexible; the usual term is 6 months to 1 year. Extensions to appointments, appointments split into two separate terms, and part-time fellowships are also possible.

Census Bureau computing resources available to the researchers include Unix servers and workstations, DEC minicomputers, and various personal computers. Computer networks also provide internal electronic mail, as well as access to the Internet through our isolated server workstation. Other support provided to researchers includes technical and secretarial support, library facilities, a travel allowance, and interaction with the Census Bureau's professional staff. Funds are also available to accommodate specialized needs for computer software and hardware. The researchers who work with Census Bureau computing equipment are subject to a routine security clearance.

Application Procedure

The following information is required of all fellowship applicants:

1. A curriculum vitae.
2. The names and addresses of three references who may be contacted.
3. Three copies of a detailed research proposal to include the following:
   a. Short descriptive title for the project.
   b. If the applicant is applying to any of the other fellowship programs in addition to the Census Bureau (i.e., BLS or NCES), please indicate the agency.
   c. Abstract of one-half page or less that summarizes the project.
   d. Proposed term (approximate dates).
   e. Background information on research topic with references.
   f. Statement of relevant work already accomplished by the researcher.
   g. Proposed research plan with sufficient detail for evaluation of expected results.
   h. Significance of expected results.
   i. Advantages of conducting the research at the Census Bureau.
   j. Requirements for research support and work facilities.
   k. Budget required for appointment including:
      - salary costs for term of appointment,
      - benefits,
      - research assistance costs,
      - hardware costs, and
      - travel costs.

Note: The following are not eligible for these fellowships: U.S. federal government employees, members of Review Boards of ASA-sponsored fellowship programs, and members of the Board of Directors of ASA.

Applications for the ASA/NSF/Census Bureau Research Fellow Program should be sent to:

Ms. Carolyn Kesner
ASA/NSF/Census Bureau Research
Fellowship Program
American Statistical Association
1429 Duke Street
Alexandria, VA 22314-3415
E-mail: carolyn@amstat.org

The application deadline is December 10. Final decisions will be made by March.