Consumer Expenditure Survey Anthology, 2011

U.S. Department of Labor
U.S. Bureau of Labor Statistics
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Report 1030

BLS

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Preface

This is the fourth in a series of reports presenting articles discussing the U.S. Bureau of Labor Statistics (BLS) Consumer Expenditure Survey (CE). The most recent report, *Consumer Expenditure Survey Anthology, 2008*, was published in December 2008. As in the previous anthologies, articles discussing ongoing research and methodological issues pertaining to the CE, and analytical articles using the survey's data, are included in this report.

The report was prepared in the Office of Prices and Living Conditions, Division of Consumer Expenditure Survey (DCES), under the general direction of Steve Henderson, Chief of the Branch of Information and Analysis, and was produced and edited by John M. Rogers, Section Chief. Articles on research and methodology were contributed by Lucilla Tan and Adam Safir of the Branch of Research and Program Development, Jennifer Edgar of the Office of Survey Methods Research, Barry Steinberg of the Division of Price Statistical Methods, and Brett Creech of the CE Branch of Information and Analysis. Analytical articles were contributed by Ann C. Foster, William Hawk, Craig J. Kreisler, and Geoffrey Paulin of the Branch of Information and Analysis.

BLS makes CE data available in news releases, reports, quarterly *Focus on Prices and Spending* articles, and articles in the *Monthly Labor Review*, as well as on CD-ROMs and the Internet. Current and historical CE tables classified by standard demographic variables are available at the BLS Internet site **http://www.bls.gov/cex**. This site also provides other survey information, including answers to frequently asked questions, a glossary of terms, order forms for survey products, and *Monthly Labor Review* and other research articles. To order on CD-Rom the Consumer Expenditure Survey microdata at the consumer unit level, go to **http://www.bls.gov/cex/csxmicro.htm**.

The material that follows is divided into two sections: Section 1 includes articles on survey research and methodology, and section 2 presents analyses of topics of interest based on CE data. An appendix includes a general description of the survey and its methods and a glossary of terms.

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Part I.
Survey Research and Methodology

Gemini Project Overview

JENNIFER EDGAR and
ADAM SAFIR

The Consumer Expenditure Survey (CE) program initiated the Gemini Project, a multiyear survey redesign effort, in early 2009. The mission of the project is to promote improved expenditure estimates in the CE by reducing measurement error. During the course of the project, CE program staff will develop, test, evaluate, and (as appropriate) implement survey design changes with the goals of improving overall data quality, increasing the analytic value of the data to users, and supporting greater operational flexibility to respond to changes in the data-collection environment.

The changes being pursued through the Gemini Project will ensure that the CE satisfies its primary purpose: maintaining the integrity of the expenditure weights used in the Consumer Price Index (CPI). Consumer expenditure data supplied by the survey are a critical component in the calculation of the CPI because they are used to estimate weights for the CPI's consumer goods and services classification structure. In the construction of the CPI, CE data serve four distinct functional uses: (1) to estimate annualized expenditures, (2) to estimate monthly expenditure weights, (3) to probabilistically select item categories for pricing, and (4) to allocate expenditure estimates between more broadly defined expenditure categories from other survey sources.[1]

Improved data quality also enhances the usefulness of CE data in meeting the needs of other data users, both public and private. Increasing the flexibility of survey operations allows the program to meet new data-quality challenges in a timely fashion.

This article reviews the background, motivation, and challenges that affect the survey and the survey redesign effort specifically. The article also provides an overview of the project's approach, major activities to date, and an overall timetable, paying particular attention to research topics affecting the redesign, as well as plans to investigate those topics. The article concludes with a summary of project accomplishments and plans for the future.

Gemini Project background

The overall goal of the Gemini Project is to improve data quality by reducing measurement error, which is the difference between the reality of a respondent's situation—and what the respondent reports to the CE. A major focus will be on underreporting, including error at the individual-item level and at the larger-scale household-budget level. The latter may not matter if the relative shares remain unbiased, but it ultimately is an important feature of underreporting that needs to be addressed. At the same time, a secondary goal will be to maintain or increase response rates; therefore, any expected benefits of survey design changes will be weighed against potential negative effects on response rates.

Motivation for redesign

All household surveys today face challenges that affect response rates, including busy respondents, confidentiality/privacy concerns, competing surveys, controlled-access residences, and non-English-speaking households. In addition, the CE is faced with particular issues that directly affect the quality of the data collected. These issues, presented in order of importance, include a) evidence of measurement er-

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[1] Casey, William. "CPI Requiments of CE," Internal Bureau of Labor Statistics Paper, 2010. Available online at **http://www.bls.gov/cex/geminimaterials.htm**.

ror in the survey data, b) environmental changes related to spending behaviors, c) a need for greater flexibility in the mode of data collection, and d) the ability to modernize data collection. The new design of the CE must address these issues.

Reducing measurement error is the primary mission of the Gemini Project, yet as certain social behaviors and technological changes become more common, there is an increased likelihood of introducing measurement error to the survey. For example, purchases made online or recurring bill payments made by automatic debit may be less salient to respondents. Flexibility in CE data-collection strategies better positions the program to respond to such changes over the long term. Furthermore, while the spending behaviors that the CE seeks to measure have changed considerably over the past 30 years, the fundamental design of the survey has not. Although a number of improvements have recently been incorporated into the survey design, including the transition to a computer-assisted personal interviewing (CAPI) instrument in the Interview Survey, there has been no large-scale, comprehensive change to the survey design since 1980.

Gemini Project objectives

The primary short-term objective of the Gemini Project is to develop a detailed redesign planning document. This document will describe the priorities, individual steps, timeframe, resource needs, and costs required to develop, pilot test, evaluate, and implement a redesigned CE. The redesign planning document will also guide the development and implementation of CE research studies throughout the Gemini Project lifecycle.

As previously noted, the long-term objectives of the redesign initiative are to introduce design changes in the CE that reduce measurement error, improve overall data quality, enhance the analytic value of CE data to users, and support a greater operational flexibility to respond to changes in the interviewing environment. These changes must occur within specified

budget levels. Therefore, all proposed changes will be subject to budgetary constraints, and implementation decisions will be considered in terms of priorities and trade-offs. To allow for an unpredictable budgetary environment, the redesign planning document will address both a complete redesign of the CE as well as more limited.

Gemini Project timeline

A high-level project timeline includes information gathering in 2009 and 2010, to be followed by information synthesis and research planning in 2011. By the end of 2012, the project aims to have a proposed redesign planning document in place for the development and implementation of a redesigned CE. The development, testing, and implementation of a redesigned survey will occur in 2013 and beyond.

Redesign challenges

Even at the outset of the survey redesign process, a number of challenges are evident. Defining survey requirements is challenging, particularly given the CE's diverse user community. Despite identifying the needs of varied users and reconciling competing interests, there are certain to be some users with unmet needs. Additionally, it is a challenge to gather, respond, and act on stakeholder concerns and suggestions while maintaining forward project progress. Finally, because of time constraints and uncertainty over the direction and nature of the forthcoming recommendations, the team is currently investigating several redesign topics, and this research will be used to support or reject some proposals. Ultimately, however, the redesign process is constrained by two overriding factors: the final survey design must produce the estimates required by the CPI, and, as mentioned above, long-term operational survey costs must keep to specified budget levels.

Project structure

The Gemini Project is composed of five teams, all of which report to the Gemini Steering Team. (See exhibit 1.) Each

team addresses a specific objective that serves the overall Gemini mission. The Research Project Tracking System Team's primary objective was to create a research database for all completed, in-progress, and proposed CE research projects that could potentially inform the survey redesign. This team has finished its work, and the Research Project Tracking System is currently in use. The Data Quality Definition Team's objective is to produce a framework for assessing CE data quality, addressing both disparate user groups as well as key elements for an operational definition of data quality. The Data Quality Definition Team focused on six dimensions: relevance, accuracy, coherence, timeliness, accessibility, and interpretability.[2]

Three other teams were formed to plan, conduct, and summarize events that provide input and recommendations on issues related to the redesign. One of these teams—called the Data User Needs Forum Team— hosted an event in June 2010 where customers described their uses of the data, data requirements, priorities, and recommendations for changes. The team will summarize the findings from the forum and a subsequent user survey in a CE program office statement on CE data priorities.

The Conference Team held a Methods Workshop in December 2010. In addition, this team has organized a Survey Redesign Workshop where five Federal survey teams gave an overview of their redesign activities, and a Data Capture Technology Forum where Nielsen, National Opinion Research Center, RTI International, and Westat presented various technologies used to collect survey data. The Conference Team also organized a panel at the 2010 American Association for Public Opinion Research (AAPOR) on respondent record use.

Finally, the User Impact Team (which is not yet formed) is charged with assessing the impact of possible redesigns on data user products.

[2]Brackstone, Gordan. "Managing Data Quality in a Statistical Agency." *Survey Methodology.* vol. 25 no. 2, 1999, pp. 139-149.

Exhibit 1. Gemini project structure

Group	Objective	Outputs
Gemini Steering Team	Oversee the Gemini Project	Team charters, Gemini Project plan, redesign planning document
Teams		
Research Project Tracking System Team	Create a research database for all completed, in-progress, and proposed CE research projects that potentially inform the survey redesign	Research Project Tracking System
Data Quality Definition Team	Produce an operational definition of data quality for CE and a framework for assessing CE data quality by its disparate user groups	Report summarizing a data quality definition and framework for CE
Conference Team	Coordinate methodology events to solicit external input and recommendations on issues related to the redesign	•Survey Redesign Panel •Data Capture Technology Forum •Respondent Records Use AAPOR Panel •CE Methods Workshop
Data User Needs Team	Coordinate an event and survey to solicit input from data users on current use, requirements, and potential use of the data	Report summarizing data user needs, priorities, and recommendations
User Impact Team	Identify the impact of possible redesign alternatives on data user	Report summarizing impact of proposed redesign alternatives on data users

After alternative designs have been proposed, this team will explore the impact of the redesign proposals on users and their uses of the data.

Major activities

Several major products have been, or will be, created as part of the Gemini Project. The first is the Research Project Tracking System (RPTS) and accompanying report. The RPTS is a database that enables status tracking for all proposed, approved, in-progress, completed, and deferred CE methods research projects that have the potential to influence the CE redesign. The system stores project information in an organized structure, providing a mechanism for Gemini Project teams to better align current and proposed projects with specific redesign needs.

The second major product is the Data Quality Definition Team's report, which provides an operational definition of data quality for the CE program. The definition includes a statement of the procedures or ways in which the program should measure data quality, provides a framework for assessing the overall quality of CE survey data, and addresses the data usability concerns of individual program stakeholders.

A third major product is a set of summary documents created after each Gemini Project event. These reports identify the presenters, key points, and implications of the event. For example, a document summarizing the Data Capture Technology Forum will serve as a starting point for future exploration into data collection technologies by identifying strengths and weaknesses of the technologies presented, and identifying possible avenues of additional research.

The User Needs Team will create a report summarizing the input provided by data users. This input, along with similar input from the CPI, will be used to create a list of CE priorities that identify the minimally required elements of CE data, as well as secondary data requirements. This is an important document for the Gemini Project because it will serve as a key reference for all subsequent events and discussions regarding potential design alternatives.

Redesign topics

Topics for current discussion. Many different elements of survey methodology influence the plans of a survey redesign. Listed below are topics deemed most important for current discussion in planning a redesigned CE. These topics are addressed first because they are fundamental to making later, more tailored decisions about issues such as mode, technology, recall aids, and overall respondent burden. Key issues associated with each topic, including benefits and risks of related design alternatives that need to be explored early in the redesign process, are also described.

Global questions. The Interview Survey averages 65 minutes.[3] The length is a result of both the breadth of expenditure categories included in the survey and depth of detailed information required for each category. The aim of the current Interview Survey is to collect information about every expenditure category from every household. One proposed approach to accomplish this objective (while also making the interview shorter) is to replace some of the detailed questions with global questions. Global questions ask about an expenditure category from an aggregate standpoint (for example, "How

[3] U.S. Department of Labor. Bureau of Labor Statistics. *BLS Handbook of Methods.* Washington: U.S. Government Printing Office: 2007

much did you spend on clothing?"), as compared with a detailed series of questions about individual expenditure types within the larger category (for example, "How much did you spend on shirts, pants, sweaters, vests, etc.?"). Replacing some of the detailed question sections with global questions would reduce the length of the survey while still providing high-level expenditure information about the given categories. However, the quality of data collected with global questions is debatable, and global questions have the potential to increase the cognitive burden of the respondent because of question difficulty. Both of these issues need to be further explored.

Interview structure. Currently the Interview Survey is a highly structured and standardized CAPI interview. The instrument is programmed to administer the questions in a set order, and the questions are designed to be read by the interviewer exactly as worded. The questions are organized into sections by topic (for example, housing, utilities, vehicle expenses, insurance, educational expenses, and so forth), a structure which forces respondents to report expenditures in a prescribed format, rather than allowing them to draw on information in a sequence that might be easier for them to recall. Nonstructured interviewing may hold promise for collecting higher quality data, but will require a very different approach to data collection. In addition, it is more difficult to administer and may require more skilled interviewers to ensure the collection of all required data.

Proxy reporting. Currently only one respondent reports expenditures in both the Interview Survey and Diary Survey, answering questions for the entire household. The accuracy of the data provided by the proxy depends on the extent to which the respondent has detailed knowledge about the expenditures of other household members. Given the complexity of many household situations, a proxy respondent may often be unaware of, or unfamiliar with, purchases made by others in the household. One approach to eliminating proxy reporting is to collect information from each person, either through an individual diary or an interview. The impact on data quality and response rates, and the risk that the same expenditure will be reported by more than one household member, are all issues requiring further investigation.

Recall period. The Interview Survey currently asks respondents to report expenditures for the past 3 months. The length of this recall period, combined with the wide range of questions, may contribute to incomplete or less accurate reporting, and may also present a substantial cognitive burden for respondents. A shorter recall period may result in improved recall and therefore higher quality reporting; however, the potential increase in the number of interviews per household required to support annual estimates may negate the benefits of increased reporting accuracy or decreased respondent burden resulting from the change. An increase in the size of the sample could counter some of these drawbacks, but would incur a significant increase in survey costs and thus would not fit within the constraints presented for the redesign.

Split questionnaire design. Currently, all Interview Survey respondents are asked about the same set of expenditure categories during each interview. The resulting collected data are used to estimate average annual expenditures in the various categories at the household level. Covering the same set of expenditure categories with every respondent means that the interview is long and burdensome. It may be possible, however, to administer subsets of expenditure categories to separate subsets of respondents and still generate average annual household-level expenditure estimates. Calculation of these estimates may depend on the statistical capability to model the noncollected data (for imputation) or the willingness of the survey stakeholders to permit other types of data manipulation, such as matching similar households.

Future topics
In addition to the topics reviewed above, several other areas will be explored during the redesign process. Before a final redesigned CE can be developed, some topics should be addressed, including the use of administrative records or external data, mixed-mode designs, new technology, and recall aids.

Administrative records/external data. Some of the information that the CE collects is also compiled by other sources. Use of external data could reduce respondent burden and potentially improve data quality. Whether these data can be used to reduce the amount of data that the CE collects depends on the availability of procedures to link or match CE sample units to external data, the quality of those data, and respondent willingness to allow the linkage.

Mixed-mode designs. Offering more than one data collection mode has the potential to increase response rates and reduce nonresponse bias, although research evidence in this area is mixed. Because the Interview Survey was designed to be administered by personal visit, and a substantial percentage of cases are administered by telephone, redesigning the survey questions to be either mode-neutral or tailored more specifically to the mode of actual administration has the potential to improve data quality and reduce measurement error.

New technology. New data collection technologies, such as personal digital assistants (PDAs), smartphones, or various types of scanning technologies, may have the potential to improve data quality, reduce respondent burden, and increase completion or response rates. Such electronic data capture devices eliminate information transfer from paper diaries to database, instead keeping the data in electronic form through-

out the process. Additionally, the portability and potentially increased convenience of electronic data capture devices may lend an immediacy and ease of use to the recording process that may substantially reduce recall burden.

Records and recall aids. Increased reliance and improved guidance on records, receipts, and recall aids, including electronic records, also has the potential to improve data quality. If the CE is able to identify a process to extract data from existing respondent records, respondent burden would also be reduced.

Redesign-related research

To help make informed decisions in the redesign process, a number of research projects have either been initiated or are in the planning stages. These redesign-related research activities are presented below.

Current studies. Several research projects directly address the effect of questionnaire length on data quality and response rates. It is often assumed that the longer the questionnaire, the lower the quality of the data, and the less likely respondents will be to complete the entire interview, either in the current wave or in subsequent waves. The literature provides mixed results on the relationship between questionnaire length and data quality or response rates, with no clear implications for the CE. Therefore, the CE is exploring this issue directly.

The Measurement Issues study has four goals, two of which are to assess the impact of a shorter interview with a split questionnaire design and the use of global questions. By dividing the Interview Survey into portions and administering each portion individually, the study will be able to draw some conclusions about the impact of questionnaire length, as well as the quality of data obtained via global questions instead of detailed questions. In addition to studying questionnaire length and the use of global questions, the Measurement Issues study will also investigate the effect of recall period

on data quality. The Interview Survey currently uses a 3-month reference period, which may be too long for respondents to reliably recall all types of expenditures; the test allows a comparison with data collected using a 1-month reference period. However, a shorter reference period may require more frequent data collection to allow for annual expenditure estimates, so understanding the impact of monthly data collection on response rates is the fourth goal of the study.

The Order Effects Test study also examines questionnaire length. This test will provide data on whether the order of the interview section (that is, earlier or later placement) has an effect on the quality of data .This test randomly assigns first wave cases to one of two conditions. The first condition will have respondents proceed through the standard Interview Survey interview. The second condition moves a section from the middle of the Interview Survey to an earlier stage of the interview. If moving a section earlier in the interview significantly improves data quality, the results would support efforts to shorten the interview.

Over the past several years, the CE has explored the use of split questionnaire methods as an alternative to the current data collection procedures. These methods involve dividing a questionnaire into subsets of questions and then administering each subset to a subsample of respondents. Currently, the feasibility of this type of split questionnaire design is being investigated as one of the test conditions in the Measurement Issues Study, described above. Serving as a counterpart to the Measurement Issues Study, ongoing analyses use historical CE data to run statistical simulations investigating the value of an allocation method to assign survey items to groups of households based on previous waves of data. Since split questionnaire methods do not ask all survey items of all households, additional research has focused on methods to "fill-in" this missing data. Specifically, the CE has explored the use of imputation-based procedures to estimate from all households instead

of only those households that were directly asked about a given expenditure category. Future research will look at refining the allocation and imputation procedures so that more efficient estimates can be obtained.

Planned studies. There are two other key issues that need to be addressed through research before major redesign decisions can be made. The first issue is the effect of proxy reporting. As noted above, the CE program relies on one respondent to provide expenditure information for the entire household, a procedure suspected of being a major source of measurement error from underreporting. The Individual Diary Study will investigate the feasibility and impact of collecting data from all household members. This study will provide an individual diary to each eligible household member. The collected data will be analyzed for improvements in data quantity and quality over current production data, as well as the impact of the procedural change on collection costs and response rates. An online diary component is planned as part of this test.

The second issue that the CE plans to address through research is measurement error. Comparison studies with external data, such as the Personal Consumption Expenditures, suggest that CE data may have significant measurement error, especially in certain categories. Currently, there is a limited understanding as to the sources of this error, and no estimates of the magnitude of the errors. The Records Study is planned to address both of these issues. In this study, participants will complete a partial CE interview. They will then be asked to locate all available records that are relevant to the expenditures covered in the interview. In a subsequent visit, interviewers will attempt to match the records with reported expenditures and to identify differences between the reported expenditures and those on the records. The comparison between reported expenditures and records-based information will provide estimates of the accuracy of the expenditure reports. A follow-up

in-depth discussion with participants will also provide insight into the causes of the errors (for example, forgetting, comprehension difficulty, proxy issues, and so forth).

Summary

Project accomplishments. The Gemini Project is designed to gather information on alternative survey designs and methodologies, to investigate the impact and feasibility of various options and propose relevant research, and to develop a planning document for redesigning the CE over approximately 3 years. Much has been accomplished to date: project teams completed data quality and research tracking reports, and drafted issue papers on preliminary redesign topics (available online on the Gemini Project website at **http://www. bls.gov/cex/geminimaterials.htm**). Additionally, in early 2010, several successful events were held to discuss issues related to the redesign, including a Survey Redesign Panel Discussion, a Data Capture Technology Forum, and a Data Users' Needs Forum.

Future plans. Looking ahead, the CE Steering Team is planning several major events and additional research studies. A methodological workshop focused on current research findings regarding interview structure, global questions, proxy reporting, recall period, and split questionnaire designs, and their implications for the CE redesign, was held in the fall of 2010. As an input to the methodological workshop, a review of current survey methods used in international consumer expenditure surveys will be prepared. In 2011, BLS plans to work with a consensus expert panel formed by the Committee on National Statistics (CNSTAT) to coordinate two events and produce a report with redesign recommendations based on the event discussions and other outside independent proposals. The 2011 events will include a household survey data producer workshop designed to determine common challenges and best practices for large-scale household survey data producers, as well as a follow-up workshop to discuss options for the CE redesign, based on internal CE research, outside proposals, and input from the CNSTAT consensus expert panel. ∎

An Introduction to the Contact History Instrument (CHI) for the Consumer Expenditure Survey

LUCILLA TAN

The Consumer Expenditure Survey (CE) Program introduced the use of the Contact History Instrument (CHI) with the CE Interview Survey in April 2005 and for use with the CE Diary Survey in March 2006. The CHI is designed to capture information about the data collection efforts and the interviewer's perceptions of interactions with the respondent when contact is made, regardless of whether an interview was conducted. Data from the CHI will be available for the first time with the 2009 CE Interview Survey public use microdata files. This article provides a brief overview of the CHI and a few illustrations of the insights that CHI data can provide about data collection efforts.

Background of the CHI

In 2002, the Census Bureau and the Interagency Household Survey Nonresponse Group sponsored a Response Rate Summit conference. The purpose of the summit was to provide a forum for discussion among experts in the field about how to address concerns related to the decreasing response rate trend in household surveys.[1] One of the recommendations that came out of the summit was that surveys should collect contact history information. This would provide data for two primary purposes: 1) to provide feedback to field staff about patterns that indicate what leads to successful or unsuccessful contact attempts, and 2) to provide data for a close examination of reasons for refusals, successful contact strategies, and differences between types of nonrespondents (refusals v. noncontact).[2]

The CHI was developed by the U.S. Census Bureau. It was designed to be a single instrument for use in all surveys that contract with the Bureau for data collection.[3] The first version of the CHI was fielded for the National Health Interview Survey (NHIS) in January 2004, and the NHIS CHI data were made available for public use with the release of the 2006 NHIS public use files. In addition to the NHIS and the CE, the Current Population Survey adopted the CHI in August 2009.

Description of the CHI

The CHI is a software application separate from the survey data collection instrument. The interviewer can access CHI via the survey's case management

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[1] Salvucci, S., Wenck, S., Hamsher, S., and Bates, N. (2002). Response Rate Summit: National Health Interview & Consumer Expenditure Quarterly Surveys. Summary Report. Synectics for Management Decisions, Inc., and U.S. Census Bureau. **http://www.fcsm.gov/ working-papers/summitreportfinal.pdf**

[2] Bates, N. (2003). Contact histories in personal visit surveys: the Survey of Income and Program Participation (SIPP) Methods Panel. AAPOR. **http://www.fcsm.gov/committees/ ihsng/aapor2003proceedingforpdf.pdf**

[3] Dyer, W. (2004). Contact History Instrument (CHI). **http://www.blaiseusers.org/2004/ papers/03.pdf**

system, or can launch CHI whenever the survey instrument is closed. The interviewer is instructed to record in the CHI every attempt made to contact the sample unit, and to do so as close as possible to the time the contact attempt was made.

The CHI prompts the interviewer for the following information about each contact attempt: the date and time of the attempt, the mode of the attempt (by personal visit or by phone), strategies the interviewer may have used to attempt to reach the respondent, and whether contact was made with the sample unit at that attempt. If the interviewer is unable to speak to someone at the sample unit, he or she can record reasons for noncontact. Alternatively, if the interviewer makes contact with the sample unit, the interviewer records whether or not an interview was conducted, and if so, whether it was partial or complete. If an interview could not be conducted, the interviewer records one or more reasons. In addition, regardless of whether there was an interview, the interviewer can record observations about the contacted sample unit member's behavior and/or concerns regarding survey participation. Exhibit 1 shows an overview of the flow of questions through the CHI.

The reporting of contact attempt strategies (exhibit 2), reasons for noncontact by mode of attempt (exhibit 3 for personal visit, exhibit 4 for phone), reasons for why an interview could not be conducted at a specific contact (exhibit 5), and the interviewer's observations about respondent behavior and concerns (exhibit 6) are made from "check all that apply" lists of options that accompany each of these questions. Exhibits 2 through 6 are screen shots from the CHI that show the response options for these characteristics of contact attempts.

Illustrations of information describing data collection effort from CHI

In addition to interviewers' notes recorded about a case, the CHI data constitute another source of information about interviewer-respondent interactions. The CHI data also provide insights to the overall data collection effort, and allow for the possibility of uncovering factors or behavior that promote or inhibit successful data collection. We offer a few illustrations of these insights, using CHI data from the CE Interview Survey for Interview 1 cases fielded in 2009. CHI information at Interview 1 is of methodological interest, because it provides a systematic description of interviewer effort, likelihood of contact, and the nature of interactions with sample unit members who are approached for the first time in the survey.

Effort expended to resolve a case. The number of contact attempts made to resolve a case with a final disposition is an indicator of the amount of effort interviewers exert to close out a case. A "final disposition" means that the interviewer closed out the case by classifying it as a *completed interview*, a *noninterview*, or *ineligible* (because the sample unit did not belong to the target population for the survey). The level of effort varies, but tends to be associated with the final disposition of the case. Completed interview cases are usually associated with relatively more cooperative respondents, and, thus, generally require fewer contact attempts to resolve the case. This fact is reflected in the CHI data. About 70 percent of the 12,106 sample units in the 2009 sample (for which there were CHI data) had been resolved as completed interviews by the fourth contact attempt, as illustrated in chart 1. Ineligible cases were also resolved fairly quickly—about 90 percent of these cases were classified as such by the fourth contact attempt. In contrast, relatively more effort was expended to resolve cases as noninterview—less than half of these cases were resolved by the fourth contact attempt, an indication that interviewers have to try harder to reach residents of these sample units, or that more attempts are needed before giving up on securing an interview. The CHI data also show that a lot of effort is expended to resolve the last 1 or 2 percent of cases still in the field. (It takes 15 or more contact attempts to resolve these cases.)

"Good" day-and-time combinations for first attempt to contact sample unit. Since costs are associated with each contact attempt, especially attempts made by personal visit, it would be cost effective if interviewers attempted to contact sample units at times when successful contacts and interviews are most likely to occur. The CHI data indicate that of the 12,106 first attempts made to contact sample units, 38.4 percent were made between 8 a.m. and 4 p.m. on Mondays through Thursdays, and 30.9 percent of those attempts resulted in contact with a sample unit member. (See chart 2.) However, it appears that evenings (4 p.m. to 9 p.m.) and weekends have slightly higher successful contact rates at first attempt. Therefore, interviewers may want to consider making a larger proportion of first attempts to contact sample units in the evenings and on weekends.

Contact strategies attempted prior to first contact with sample unit. Among the 9,465 first contacts made with sample unit members, 86.3 percent were made by personal visit. An average of 2.2 attempts was made to obtain a first contact by personal visit and 3.5 attempts to obtain a first contact by phone. An average of 1 strategy was used when a first contact with a sample unit member was made by personal visit (1.1 strategies), as well as by phone (1.2 strategies). The most frequently reported contact strategies used prior to first contact by both personal visit and phone were similar: "left appointment card or note with the sample unit," "checked with neighbor," and "advance letter given." (See chart 3.)

Reasons for incomplete interview or noninterview at first contact with sample unit. The primary reasons cited for an incomplete interview or noninterview at first contact with a sample unit are similar, regardless of whether first contacts were made by personal visit or by phone. The most frequently reported reason—more than a third of

the time—was "inconvenient time" for the sample unit. (See chart 4.) The next most frequently cited reason was reluctance on the part of the respondent.

Respondent concerns, attitude, and/or behavior at first contact with sample unit and final disposition. Interviewer observations about the contacted sample unit member, regardless of whether an interview was conducted, appear to be associated with final disposition of a case. For example, nearly two-thirds of cases where interviewers reported that respondents were concerned about time ("too busy", "interview too time consuming") or privacy had a final disposition of "completed interviews." (See chart 5.) In contrast, fewer than a third of cases where interviewers reported the contacted sample unit member exhibited hostility ("hang up/slam door", "hostile behavior") had a final disposition of "completed interviews." This is consistent with research studies supporting the usefulness of these interviewer-respondent interactions recorded in the CHI for predicting survey nonresponse.[4]

Recent survey methodological studies on the Consumer Expenditure Interview Survey have drawn on CHI data in their analyses. For example, in a study that attempted to quantify the magnitude of relative nonresponse bias for key survey measures in the CE Interview Survey, respondents were classified as *harder-to-contact* when more than 45 percent of their contact attempts resulted in noncontact and were treated as proxies for nonrespondents.[5] In a study of the effect of incentives, indicators of respondent cooperation and estimates of field collection costs in the study were based on contact attempt information from the CHI.[6] In an exploratory study that examined trade-offs between fundamental survey performance measures for establishing the "optimal number" of contact attempts, CHI information were utilized to form comparison groups for analysis, and were inputs to the construction of a summary index for reporting quality.[7] In another exploratory study, interviewer reported observations about respondent behavior and concerns about survey participation in the CHI were found to strongly differentiate between the risk of first occurrence of nonresponse between groups of respondents with different types of concerns.[8]

Limitations of the CHI

A weakness of the CHI data is that it is based on each interviewer's self reports. There is no mechanism to ensure that the interviewer enters every contact attempt for a case in the CHI, or that any contact attempt will be recorded for a case. For example, out of the 12,304 Interview 1 sample addresses fielded in 2009 for the CE Interview Survey, 1.6 percent (198 cases) did not have any CHI records. Of these cases without CHI, 58.1 percent were resolved as ineligible, 28.3 percent as completed interviews, 5.6 percent as noninterview because the sample unit refused the interview, and 3.1 percent as noninterview due to noncontact with the sample unit (no one home). There is also no verification that the correct reason for a noncontact is reported. Despite these limitations with the CHI data, survey methodologists have found information such as sample unit behavior and concerns reported by interviewers in the CHI to be very useful, especially in the absence of other information about nonrespondents.

A study on the quality of the CHI data for the CE Interview Survey is currently underway. This study is a collaborative effort undertaken with the National Health Interview Survey and the Current Population Survey, the other two surveys that also utilize the CHI.[9] The study will examine how the CHI is being used by the three surveys, and compare findings from the CHI across the three surveys. Without a "gold standard" to evaluate the CHI data, this comparative approach will shed some light on the extent of consistency of the CHI data within and across the three surveys.

Summary

This article gave an overview of the Contact History Instrument (CHI) and provided illustrations of how the CHI data can provide information about the data collection effort. CHI data for the 2009 CE Interview Survey will be released with the 2009 CE Interview Survey public use microdata files. The CHI data included in the public use files are for Interview 1 through Interview 5, for all eligible cases (that is, completed interviews and noninterviews) that have CHI records. ∎

[4] Groves, R. and Couper, M. (1996). Contact-level influences on cooperation in fact-to-face surveys. Journal of Official Statistics, 12, pp. 63–68.

[5] King, S.L., Chopova, B., Edgar, J., Gonzalez, J.M., McGrath D.E., and Tan, L. (2009). Assessing nonresponse bias in the Consumer Expenditure Survey. Proceedings of the Section on Survey Methods Research, American Statistical Association, pp. 1808–1816.

[6] Goldenberg, K.L., McGrath D.E., and Tan, L. (2009). "The effects of incentives on the Consumer Expenditure Interview Survey." Paper presented at the Annual Meeting of the American Association for Public Opinion Research.

[7] Safir, A., and Tan, L. (2009). Using Contact Attempt History Data to Determine the Optimal Number of Contact Attempts. Paper presented at the Annual Meeting of the American Association for Public Opinion Research.

[8] Tsai, S. and Tan, L. (2010). An exploratory study on the effect of pre-paid incentives on the first occurrence of nonresponse in the Consumer Expenditure Interview Survey. Internal BLS-DCES Internal Report.

[9] Bates, N., Dahlhamer, J., Phipps, P., Safir, A., and Tan, L. (2010). Assessing Contact History Data Quality and Consistency Across Several Federal Surveys. Paper to be presented at the Joint Statistical Meetings of the American Statistical Association.

Exhibit 1. Question Flow in Contact History Instrument

Are you making a contact attempt or just looking at a case?
1. Contact attempt
2. Looking at a case. Exit

→ **1** → **Are you entering the CHI at the time of a contact attempt?**
1. Yes
2. No

2 → Exit CHI

2 → Enter date (mm/dd/yy) and time (hh;mm a.m./p.m.) of contact attempt

1 →

Was this a personal visit or telephone contact attempt?
1. Visit
2. Phone

1 or 2 →

Outcome of contact attempt
1. Contact with sample unit member
2. Contact with nonsample unit member
3. Noncontact

2 or 3 →

1 →

Outcome of contact
1. Case final disposition assigned, ready to transmit
2. Partial interview
3. Unable to conduct interview

1 →

2 or 3 →

Attempt made by personal visit

Attempt made by phone

Reasons for partial interview , or unable to conduct interview.
Enter all that apply:
  1-8 for CE Diary Survey
  1-7 for CE Interview Survey

Noncontact (personal visit attempt). Select reasons.
Enter all that apply 1-14.

Noncontact (phone attempt). Select reasons.
Enter all that apply 1-7.

Respondent concern/ behavior / reluctance
Select categories that describe respondent concerns, behavior, or reluctance during this contact attempt.
Enter all that apply 1-23.

Contact strategies attempted.
Select the categories that describe the strategies used on this contact attempt.
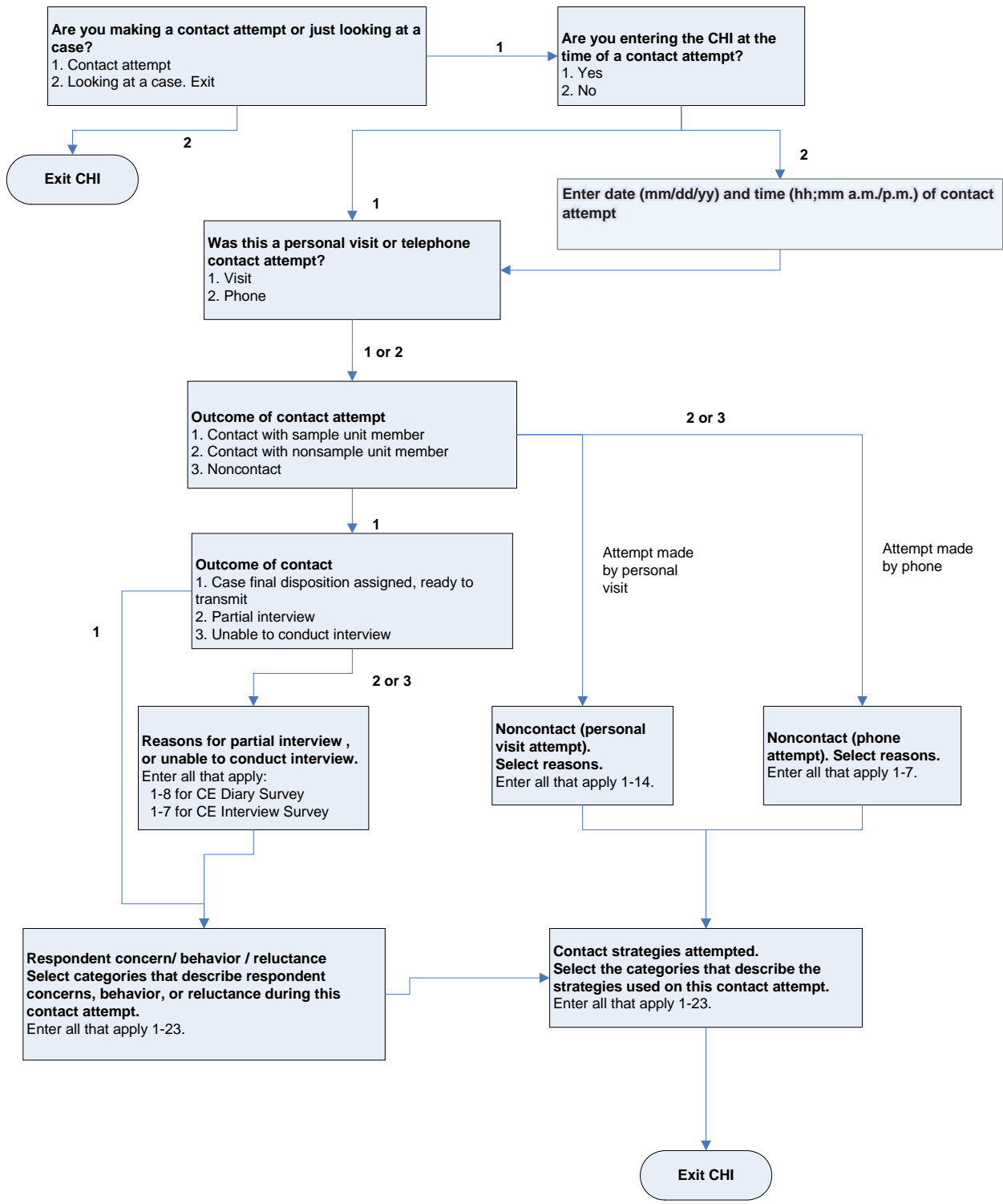Enter all that apply 1-23.

Exit CHI

Exhibit **2. CHI: response options for contact attempt strategies attempted**

Contact History Instrument v5.9.1 Created 09/13/2005

Forms Answer Navigate Options Help

CHI

◆ CONTACT STRATEGIES ATTEMPTED
- ◆ Select the categories that describe the strategies used on this contact attempt.
- ◆ Enter all that apply, separate with commas.

☐ 1. Advance letter given		☐ 13. Contacted other family members
☐ 2. Scheduled appointment		☐ 14. Contacted property manager
☐ 3. Left note / appointment card		☐ 15. Visited county assessor / post office / permit office
☐ 4. Left promotional packet / informational brochure		☐ 16. On-line tracking database
☐ 5. Called household		☐ 17. Sought help from SFR / RO
☐ 6. Left message on answering machine		☐ 18. Reassignment
☐ 7. FR will request No One Home Letter		☐ 19. Offered incentive
☐ 8. FR will request Refusal Letter		☐ 20. CED double placement
☐ 9. FR will request Better Understanding Letter		☐ 21. Used MAF or ALMI
☐ 10. Called contact persons		☐ 22. None
☐ 11. Stake-out		☐ 23. Other - specify
☐ 12. Checked with neighbors		

Strategies attempted

Exhibit 3. **CHI: response options for contact attempt by personal visit resulting in noncontact**

Contact History Instrument v5.9.1 Created 09/13/2005

Forms Answer Navigate Options Help

CHI

◆ NONCONTACT / PERSONAL VISIT
- ◆ Select the categories that describe this personal visit noncontact.
- ◆ Enter all that apply, separate with commas.

☐ 1. No one home	☐ 8. Address does not exist/unable to locate
☐ 2. No one home -- appointment broken	☐ 9. On vacation, away from home / at second home
☐ 3. No one home -- previous note / letter taken	☐ 10. Spoke with neighbor
☐ 4. Household does not answer door -- evidence someone is home	☐ 11. Building management / doorman contact
☐ 5. Drive-by	☐ 12. Completed case (Type B or C)
☐ 6. Multiple drive-bys - specify	☐ 13. Sample respondent moved - specify
☐ 7. Unable to reach / locked gate / buzzer entry	☐ 14. Other - specify

Noncontact Personal Visit

Exhibit 4. **CHI: response options for contact attempt by phone resulting in noncontact**

Contact History Instrument v5.9.1 Created 09/13/2005

Forms Answer Navigate Options Help

CHI

◆ NONCONTACT / TELEPHONE
- ◆ Select the categories that describe this telephone noncontact.
- ◆ Enter all that apply, separate with commas.

☐ 1. Got answering machine / service
☐ 2. No answer
☐ 3. Busy Signal
☐ 4. Disconnected
☐ 5. Wrong number
☐ 6. FAX number
☐ 7. Other - specify

Noncontact Telephone attempt

Exhibit 5. **CHI: response options for unable to conduct or complete interview when contact is made with sample unit**

Note: Both CE Interview Survey and CE Diary use the same Contact History Instrument. Option 7 is valid only for the CE Diary.

Exhibit 6. **CHI: response options for respondent behavior or concerns perceived by the interviewer when contact is made with the sample unit**

Chart 1. **Number of contact attempts to final case disposition**

2009 Consumer Expenditure Interview Survey, Interview 1

Legend:
- Completed interview (n=7,364)
- Noninterview- refused(n=1,361)
- Noninterview-noncontact (n=421)
- Noninterview - other(n=424)
- Ineligible sample units(n=2,536)
- Overall (n=12,106)

Cumulative percent

Number of contact attempts
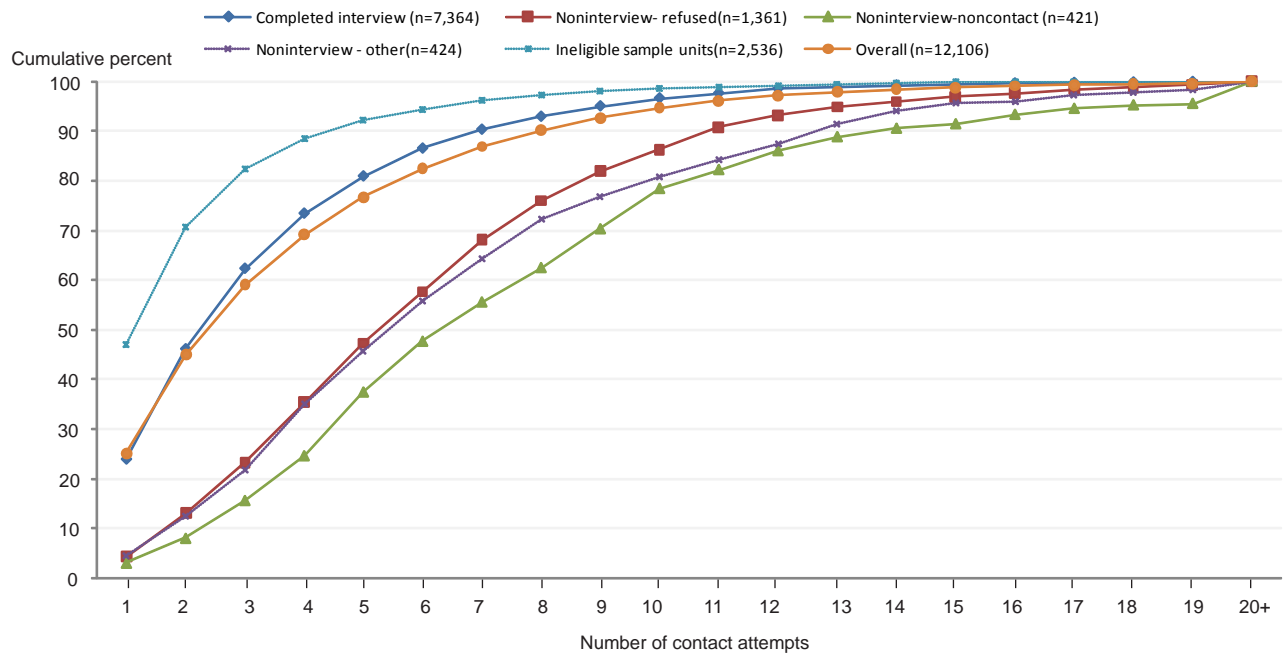
Chart 2. **Day and Time of 1st Attempts and 1st Contact with Sample Unit**

2009 Consumer Expenditure Interview Survey, Interview 1

Legend:
- Percent distribution of 1st attempts (N=12,106)
- Percent distribution of 1st attempts that resulted in contact (N=4,195)

Percent

Days of week and time	Percent dist. of 1st attempts	Percent dist. resulting in contact
Overnight	2.3	24.8
Mon-ThuDay	38.4	30.9
Mon-Thu Evening	27.3	40.8
Fri Day	7.5	38.1
Fri Evening	4.1	34.1
Sat Day	9.0	38.0
Sat Evening	4.0	32.3
SunDay	4.1	32.9
Sun Evening	3.2	37.7

Days of week and time
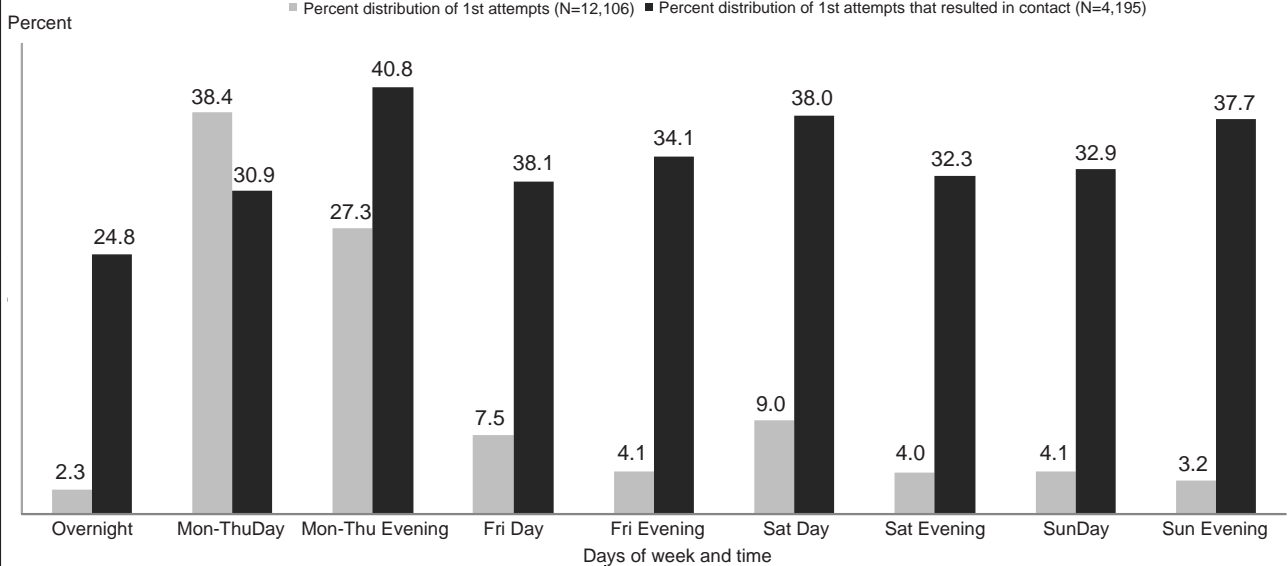
NOTE: Day: 8:00 a.m. to 4:00 p.m.   Evening: 4:00 p.m. to 9:00 p.m.   Overnight: 9:00 p.m. to 8:00 a.m.

Chart 3. **Most frequently reported contact attempt stagies used prior to first contact with sample unit member**
2009 Consumer Expenditure Interview Survey, Interview 1

■ First contact by personal visit (N=8,167)   ▨ First contact by phone (N=1,298)

Percent reporting

Strategy	Personal visit	Phone
Left note/appointment card	28.6	59.1
Checked with neighbor	8.4	16.6
Advance letter given	7.3	12.6
Left promotional information	7.3	17.6
Left message on answering machine	2.1	12.6
Requested "No One Home" letter	5.7	10.6

Strategy
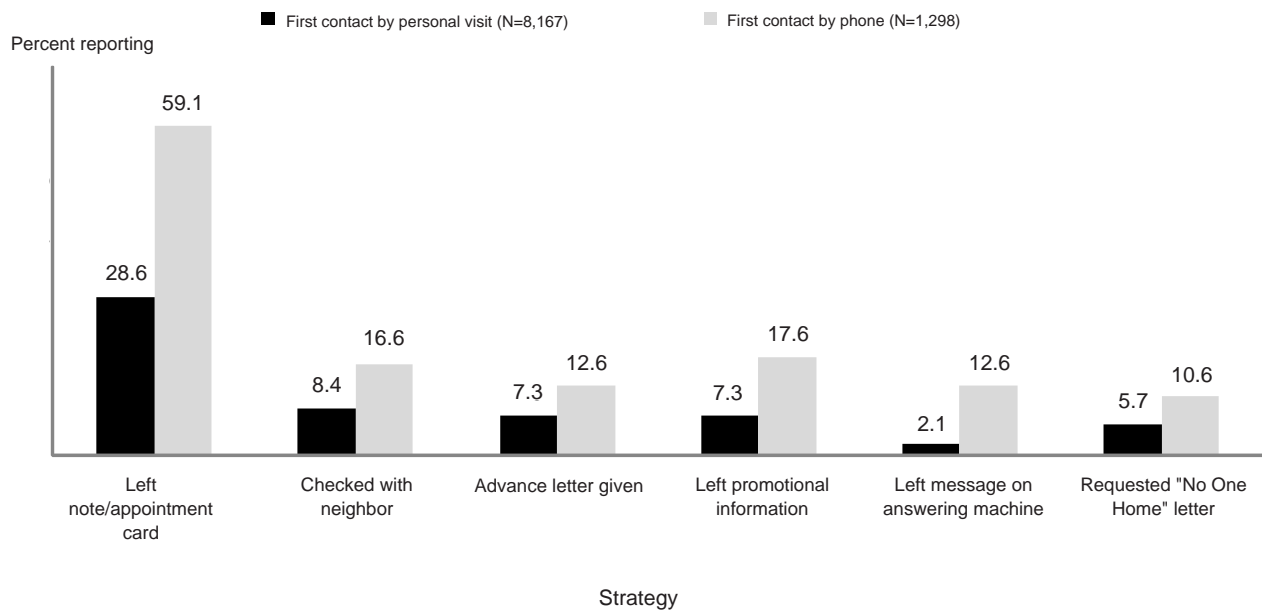
Chart 4. **Reasons for incomplete interview of noninterview at first contact**
2009 Consumer Expenditure Interview Survey, Interview 1

■ First contact by personal visit (N=4,574)   ▨ First contact by phone (N=794)

Percent reporting

Reason	Personal visit	Phone
Inconvenient time	68.4	65.2
Reluctant respondent	19.4	19.4
Eligible person unavailable	12.4	4.3
Spoke with someone	4.7	6.9
Language problem	3.0	0.6
Health problem	2.6	1.5

Reason
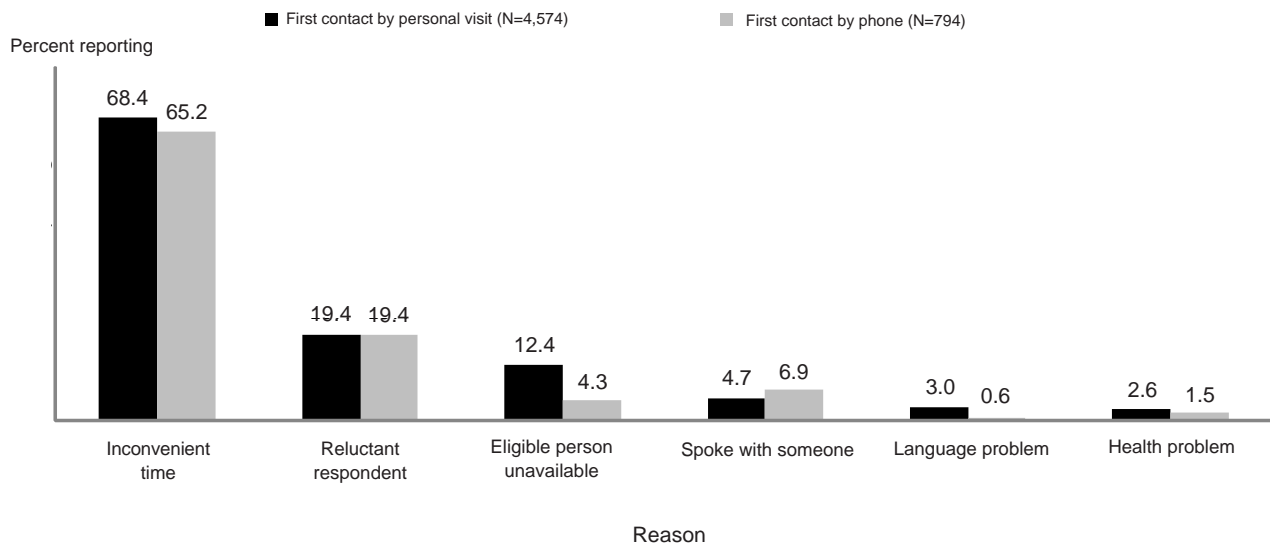
Chart 5. **Selected respondent concerns reported at first contact and completed interviews**

2009 Consumer Expenditure Interview Survey, Interview 1

Percent reporting

■ Percent of cases reporting concern that were completed interviews

67.8	62.6	62.7	49.4	41.2	32.6	16.4
Too busy	Too time consuming	Privacy	Anti-government	Not interested	Hang up/ slam door	Hostile behavior

Concern
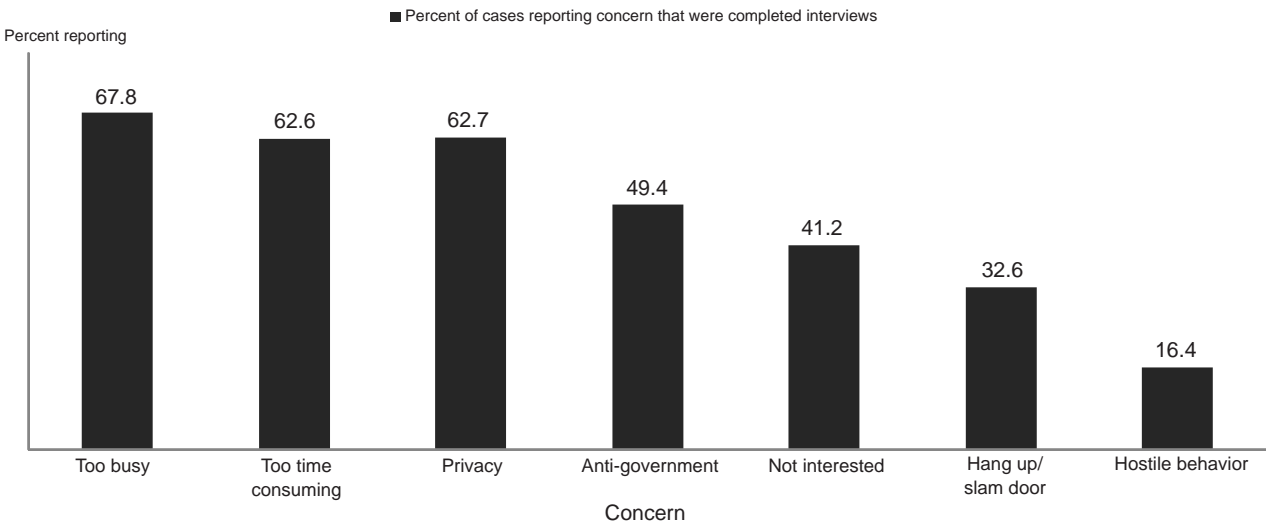
CE Source Selection for Publication Tables

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The Consumer Expenditure Survey (CE) is a nationwide household survey conducted by the U.S. Bureau of Labor Statistics (BLS) to find out how Americans spend their money. The CE consists of two components, each with its own questionnaire and sample: the Interview Survey and the Diary Survey. The data are collected for the BLS by the U.S. Census Bureau. There is some overlap in the information collected by the two surveys, and data from only one of the surveys are used for each item in the publication tables. Therefore, when expenditure information is collected about a particular item category in both surveys, a decision needs to be made about which source of information is the more reliable for publication purposes.

In the Interview Survey, consumer units[1] (CUs) are visited once every 3 months over a period of 13 months. The survey collects expenditures on items that respondents can reasonably recall for a period of 3 months or longer, such as furniture or vehicle purchases, and expenses that occur on a regular basis, such as rent, utility payments, and insurance premiums. In the Diary Survey, CUs report expenditures in two consecutive 1-week diaries.

[1] A consumer unit is defined as members of a household related by blood, marriage, adoption, or other legal arrangement; a single person living alone or sharing a household with others but who is financially independent; or two or more persons living together who share responsibility for at least 2 out of 3 major types of expenses—food, housing, and other expenses. The terms consumer unit and household are often used interchangeably.

Although CUs are asked to report all of their expenditures in the diaries, the focus of the diaries is on the expenditures of frequently purchased items.

Background

Prior to 1980, the CE was conducted at about 10-year intervals. However, since 1980 it has been conducted as an ongoing survey. From 1980 to 1983, CE data were published separately for the Diary and Interview surveys, but beginning in 1984, selected data were chosen from each survey and combined to produce publication tables.

Such integrated data from the BLS Diary and Interview Surveys provide a complete accounting of consumer expenditures and income that neither survey alone is designed to do. For example, the Diary Survey does not collect data on expenditures for overnight travel or information on reimbursements, whereas the Interview Survey does. Examples of expenditures for which reimbursements are not collected in the Diary Survey are medical care; automobile repair; and construction, repairs, alterations, and maintenance of property. The Interview Survey does not collect detailed food expenditures, or expenditures for housekeeping supplies, personal care products, and nonprescription drugs. These are items collected uniquely in the Diary Survey.

For items that are unique to one survey or the other, the choice of which survey to use as the source of data is obvious. This article briefly describes the methods employed to select the appropriate survey source for published survey estimates where there is overlap in coverage between the surveys.

Past methods of source selection

Expenditure items in the current CE are identified using the Universal Classification Codes (UCC) system. A UCC is a six-digit code that classifies reported expenditures at the most detailed level. An example of a six-digit UCC is "Tolls or Electronic Toll Passes," which is classified as UCC 520541. Selection of survey source for UCCs common to both the Diary and Interview Surveys was first conducted for tabulations of 1984–86 data through an Estimated Mean Square Error (MSE) method that used 1982–84 data. This method added the variance of the CE data to the squared difference between the mean of the CE data and the Personal Consumption Expenditure (PCE) produced by the Bureau of Economic Analysis to produce an estimate of the MSE for each CE source. The source with the smaller MSE was chosen. The method of source selection was changed in 1997 and used CE data from 1993–95. A Coefficient of Variation (CV) was computed for each source, and the source with the smaller CV was selected.

CE data are used extensively by the Consumer Price Index (CPI). In 2001, meetings were conducted at the request of the CPI group to look at differences in source selection between the CE and the CPI using 1999 data. At that time fewer than 15 UCCs had different sources between the two programs. It was recommended that the CPI adopt the CE source decision in all cases with greater than 50 reports of expenditures at the UCC level. Subsequently when new expenditure items and UCCs were introduced in 2005, source selection was coordinated so that the CE and the CPI were in agreement on the newly introduced UCCs.

In 2007, a team was formed with the task of reviewing the previous methods of source selection and developing a new quantitative methodology for selecting expenditure data from the two surveys.

CE coverage versus CPI coverage

The CPI is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. The CE provides BLS with expenditure data that are used to calculate the relative importance of items in the market basket. One reason the CE and CPI used different sources in the past is that the population coverage of the CE differs from that of the CPI. The CPI is calculated for urban CUs, whereas the CE uses all CUs (urban and rural) in their calculations. Definitions of components also differ between the CE and the CPI. For example, homeownership is treated differently in the two surveys: actual expenditures of homeownership are reported in the CE, whereas the CPI uses a rental-equivalence approach that estimates the change in the cost of obtaining, in the rental marketplace, services equivalent to those provided by owner-occupied homes.

The CE publishes expenditures for items such as medical care and auto repair net of reimbursements by health insurance and vehicle insurance, respectively. Reimbursements for these expenditures are captured in the Interview Survey and are used in calculating out-of-pocket expenditures. The Diary Survey does not collect reimbursement data so expenditures for these items are necessarily taken from the Interview Survey. There are also transportation UCCs that are derived from information exclusively in the Interview Survey. For example, for a new car purchase, the value of any trade-in vehicles is deducted from the purchase price to calculate the net out-of-pocket expense for the new car.

Other issues affecting source selection

A small number of UCCs are excluded from the source selection process. In some cases, the number of Diary Survey observations reported directly by respondents was so small that it disqualified the Diary Survey as a source. While the source selection methodology generally evaluates sources based on the number of expenditure reports over a given year, there are some items included in the chained C-CPI-U price index for which a sufficient number of monthly expenditure reports are required. In order to compare the monthly expenditure counts from both surveys, the Diary Survey's monthly counts have to be adjusted upward to account for the Interview Survey's longer recall period and larger sample size. During the 2007 source selection process, the source for four UCCs was based on a monthly comparison of adjusted Diary Survey counts to Interview Survey counts.

Source selection methodology

Implementing the source selection methodology involves a number of steps. Counts, sample means, and sample variances are calculated for each UCC. Before calculating means and variances, expenditure data are top coded and bottom coded to minimize the impact of outliers. Bottom coding is a form of censoring the data and is performed by applying the value of the 1st percentile to replace all smaller values. Conversely, top coding applies the value at the 99th percentile to replace all larger values for each UCC.

Next, the counts (each represents a reported expenditure for that UCC) and Z-Scores (defined below) are weighted for the three most recent collection years using the following scheme, which places greater emphasis on the more recent collection years:

- 1st collection year (oldest) by 1/6. (For 2007, 2004 data are used.)

- 2nd collection year (middle) by 2/6. (For 2007, 2005 data are used.)

- 3rd collection year (most recent) by 3/6. (For 2007, 2006 data are used.)

If a new UCC was created within the most recent 2 years or if there was a change in the collection instrument that caused a significant difference between the means in the years before and after the instrument change, then the 2 most recent years of data are analyzed. Counts and Z-Scores are

weighted with more emphasis given to the most recent collection year:

- 1st collection year (oldest) by 2/5. (For 2007, 2005 data are used.)

- 2nd collection year (most recent) by 3/5. (For 2007, 2006 data are used.)

Source selection decision criteria

Definitions of the statistical terms used in the analysis are as follows:

1) **UCC Mean**—the weighted annual average expenditure for the CPI-U population using the adjusted full sample weight.

2) **UCC Z-Score** =

$$\frac{(\overline{X}_I - \overline{X}_D) - (\mu_I - \mu_D)}{\sqrt{\sigma_{\overline{X}_I}^2 + \sigma_{\overline{X}_D}^2}}$$

$\overline{X}_I$ = Annual UCC mean[2] from the Interview Survey

$\overline{X}_D$ = Annual UCC mean from the Diary Survey

μ_I = Annual UCC population mean from the Interview Survey

μ_D = Annual UCC population mean from the Diary Survey

$\sigma_{\overline{X}_I}^2$ = Annual UCC variance from the Interview Survey

$\sigma_{\overline{X}_D}^2$ = Annual UCC variance from the Diary Survey

With the null hypothesis that the team tested, H_o: $\mu_I = \mu_D$ or

$\mu_I - \mu_D = 0$, the Z-Score represents the test of equality between the two weighted source means. The numerator is the difference between the sample means $(\overline{X}_I - \overline{X}_D) - 0$. The denominator is the standard deviation of that difference; it is assumed that the two surveys are statistically independent of each other. Variances are estimated using the method of Balanced Repeated Replications (BRR)[3] with 44 replicates.

In order to determine which source to select for each UCC, the following decision criteria are used:

Criterion 1: Counts Sufficiency. For each UCC and each survey, the number of CUs with at least one expenditure is counted for each of the 3 most recent data collection years. This yields six counts for each UCC: three yearly counts for the Interview Survey and three yearly counts for the Diary Survey. These counts are used to ensure that a sufficient amount of data is available to make source selection decisions. A sufficient amount of data exists when the count for each of the 3 years is greater than or equal to 60.[4]

- If both surveys have sufficient data, then proceed to Criterion 2.

- If both surveys lack sufficient data, then keep the original source.

- If one survey has sufficient data, but the other has insufficient data, then a weighted average of the three yearly counts for the survey having an insufficient amount of data is computed: $n^* = (3/6)n_{t-1} + (2/6)n_{t-2} + (1/6)n_{t-3}.$[5]

- If the weighted average n^* from the insufficient survey is greater than or equal to 60, then proceed to Criterion 2.

- If the weighted average n^* from the insufficient survey is still less than 60, then use the survey with sufficient data as the source.

Criterion 2: Statistical Significance.
a) If the absolute value of the weighted Z-Score, $z^* = (3/6)z_{t-1} + (2/6)z_{t-2} + (1/6)z_{t-3}$, is greater than or equal to 1.645 then select the source based on the following[6]:

- If the weighted Z-Score is greater than or equal to 1.645, then the Interview Survey is selected as the source.

- If the weighted Z-Score is less than or equal to −1.645, then the Diary Survey is selected as the source.

b) If the weighted Z-Score is between −1.000 and 1.000, then the current source will continue to be used.

c) If the weighted Z-Score is greater than 1.000 and less than 1.645 or less than −1.000 and greater than

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[2] $\overline{X}_I$ and $\overline{X}_D$ represent the weighted means of collected data from the Interview and Diary Surveys, respectively. μ_I and μ_D represent the population means for the Interview and Diary surveys, respectively, which are unknown. For the Z-score calculation, the null hypothesis tests that the difference between μ_I and μ_D is zero.

[3] Balanced Repeated Replication (BRR) is a method of variance estimation used for sample survey statistics when the complexity of a survey's sample design prevents standard classical variance estimation techniques from being used. BRR belongs to a class of variance estimation techniques that use *replications*. The basic idea behind replication is to select subsamples of the collected data repeatedly from the full sample, and then calculate the statistic of interest from both the full sample and from each sub-sample. These sub-samples are called *replicates*. The difference between the replicate estimates and the full sample estimate are then used to estimate the variance of the full sample statistic.

[4] The number 60 represents an average of five expenditures per month, which was found to be the minimum number of expenditures needed to produce stable results.

[5] For the equation $n^* = (3/6)n_{t-1} + (2/6)n_{t-2} + (1/6)n_{t-3}$, t represents the evaluation year with the collection years being t–1, t–2, and t–3. For example, a 2007 evaluation will have t–1 representing collection year 2006, t–2 representing collection year 2005, and t–3 representing collection year 2004. The same concept applies to $z^* = (3/6)z_{t-1} + (2/6)z_{t-2} + (1/6)z_{t-3}$ that will be mentioned later in the article.

[6] The value of 1.645 represents the 95th percentile of the standard normal distribution. It is often used in research as the critical value in determining statistical significance. On the left side of the standard normal distribution, the value of −1.645 represents the 5th percentile and is used in a similar manner.

–1.645, the following method is used to select the source:

- If all three Z-Scores are greater than 1.000, then the Interview Survey is selected as the source.

- If all three Z-Scores are less than –1.000, then the Diary Survey is selected as the source.

- In all other scenarios, the source remains the same.

2007 data results from the source selection process

Table 1 lists the number of overlapping UCCs researched for source selection and the number of UCCs that changed sources. Out of approximately 900 UCCs, there were 222 overlap UCCs that were researched, resulting in 22 changing sources. Eighteen changed because they had high Z-Scores (absolute values) and 4 changed due to the Diary Survey failing the counts criterion, thereby switching to the Interview Survey. There were a total of 9 UCCs that had fewer than 60 observations in both surveys; therefore the source stayed the same. A total of 75 UCCs had observations in the Diary Survey that failed the counts criterion, thereby using the Interview Survey as the source. Only one UCC had an observation in the Interview Survey that failed the counts criterion. There were a total of 94 UCCs that had high Z-Scores (their absolute values were greater than or equal to 1.645), 27 UCCs with low Z-Scores (their absolute values were less than 1.000) and 16 UCCs with Z-Scores between 1.000 and 1.645 or between -1.000 and –1.645.

2009 results

The source selection process implemented in 2007 was used to evaluate 2006–08 data for the development of 2009 estimates. Upon receiving a list of new UCCs, the source selection program was run on all UCCs having data in both the Interview and Diary surveys. The 3-year period from 2006–08 was used for most UCCs, and 2007–08 data for the newer UCCs. After calculating the expenditure counts and Z-Scores, the procedures identified six UCCs for which the applicable source selection criterion had changed. After further evaluation the source was changed for only two of them.

The source for two of these six UCCs had been changed in 2007 and it was decided not to change again in 2009, to avoid an undue switching between sources every 2 years. Of the remaining four UCCs, it was decided to keep the Interview Survey as the source for two UCCs because of concerns about the consistency of the Diary Survey estimates. When the analysis was completed, two UCCs changed sources from the Diary Survey to the Interview Survey.

Summary

Source selection is the process of choosing the better survey to use in CE's official published expenditure estimates. It is a multistep process performed every 2 years for every overlapping UCC by comparing expenditure data from both the Interview and Diary Surveys using a counts criterion and weighted Z-Score approach to determine the better source for use in CE production. The method uses the previous 3 years of data when available, giving more weight to the most recent years. For new UCCs only 2 years of data are used. The data are adjusted for outliers in both the Interview and Diary Surveys. A number of criteria are then tested to determine which source to select. The first criterion assesses the number of unweighted consumer units making an expenditure for each UCC in each survey and may eliminate a source where an insufficient number of CUs report. The next criterion chooses the source that provides the larger overall expenditure per UCC. The means of reported expenditures, weighted by year, are compared from each survey using a standard Z-test, and in essence, the statistically significant larger mean is chosen.

The source selection process will continue to be run every 2 years. In addition to running the process, the CE will be looking for ways to accelerate the process by methods such as automation. Future research will also be performed to adapt the process for changes in survey instruments, collection methodology, and data processing. ■

Table 1. **Number of overlap Universal Classification Codes (UCC) researched for source selection**	UCCs researched	UCCs changing source
Total	222	22
UCCs for any year with observations less than 60 in both surveys	9	0
UCCs in which the observations in the Diary survey fail the counts criterion	75	4
UCCs in which the observations in the Interview survey fail the counts criterion	1	0
UCCs with Z-scores between –1.00 and 1.00	27	0
UCCs with Z- scores of +–1.00 and +–1.645	16	0
UCCs with Z- scores of –1.645 or less	68	17
UCCs with Z- scores of 1.645 or greater	26	1

Part II.
Analyses Using Survey Data

Health care spending patterns of U.S. consumers, by age, 1998, 2003, and 2008

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The National Health Care Expenditure Accounts (NHEA), the official estimates of total health care spending in the United States, show that in 2008, U.S. health care spending by business, governments, and households was $2.3 trillion, or $7,681 per person. The NHEA also shows that in 2008 health care spending was 16.2 percent of the gross domestic product (GDP), up from 13.5 percent in 1998.[1]

NHEA estimates indicate that households accounted for 34 percent of spending on health services and supplies in 1998, 32 percent in 2003, and 31 percent in 2008. In 1998, household health care spending averaged 5.3 percent of adjusted personal income, increasing to 5.8 percent in 2003, and 5.9 percent in 2008.[2]

Although NHEA data supply a great deal of information to the Government and play an important role in health care policy decisions, they fail to provide a complete picture of how increases in health care spending influence household budget decisions. For this reason, Consumer Expenditure Survey (CE) data from the U.S. Bureau of Labor Statistics (BLS) are used to provide a snapshot of out-of-pocket health care spending changes among consumer units[3] by age of the reference person[4] in 1998, 2003, and 2008. This study examines changes in total health

[1] When the Centers for Medicare and Medicaid Services publish NHEA data for subsequent years, data from previous years often are revised. The NHEA data cited were those released with the 2008 estimates and accessed January 12, 2010. NHEA data for 2009 were released on January 6, 2011, and the earlier data were replaced with newer data titled "National Health Expenditures by Type of Service and Source of Funds: Calendar Years 1960–2009" (U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, Jan. 6, 2011), on the Internet at **http://www.cms.hhs.gov/NationalHealthExpendData/downloads/highlights.pdf** (visited Jan. 6, 2011)

[2] Healthcare Services and Supplies (HSS), a subset of the NHEA, excludes Investment, the sum of medical sector purchases of structures and equipment and expenditures for noncommercial medical research. In 2008, HSS was $2.2 trillion compared with $2.3 trillion for the NHEA. A continued drop in the share of health care outlays represented by consumer out-of-pocket spending contributed to the decline between in household share between 1998 and 2005 when it reached 31 percent where it has remained. Adjustments to personal income included adding contributions to social insurance for Medicare and excluding health benefit payments. This information is from "Sponsors of Health Care Costs: Business, Households and Governments, 1987-2008," Centers for Medicare and Medicaid Services, Baltimore, MD, and was accessed on August 10, 2010. The data in this report were revised and updated and the report replaced with "Sponsors of Health Care Costs: Business, Households and Governments, 1987–2009," available online at **www.cms.gov/NationalHealthExpendData/downloads/bhg09.pdf** (visited Jan. 6, 2011).

[3] A consumer unit is defined as (1) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangement, such as foster children; (2) a financially independent person living alone, sharing a housing unit with others, or living as a roomer in a private home, lodging house, or permanently in a hotel or motel; or (3) two or more persons living together who pool their incomes to make joint expenditures. For more information, see *BLS Handbook of Methods*, chapter 16, "Consumer Expenditures and Income" (updated 4/2007), available online at **http://www.bls.gov/opub/hom/pdf/homch16.pdf** (visited October 25, 2010).

[4] In the CE, the reference person is the first consumer unit member mentioned by the respondent when asked to "start with the name of the person or one of the people who owns or rents the home." It is with respect to the reference person that the relationship of the other consumer unit members is determined. For more information, see "Consumer Expenditure Survey Glossary," available online at **http://www.bls.gov/cex/csxgloss.htm#chars**. (visited August 4, 2010).

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care spending in dollars as well as in the share of total annual expenditures. Changes in the distribution of health care spending by health care commodities and services are also examined.

Data and methodology

This research uses CE data from the 1998, 2003, and 2008 Interview Survey collection years.[5] However, BLS provides integrated data from the CE Diary and the Interview Surveys online.[6] For each year examined, this study sample consists of consumer units interviewed in that year who reported positive health care spending (net of any reimbursements) during an interview. Expenditure estimates presented for the collection year are annual estimates, whereas percent-reporting numbers are average quarterly estimates. Quarterly percent-reporting estimates are computed by adding up the number of consumer units reporting a positive health care expenditure during a given quarter and dividing this figure by the total number of consumer units interviewed during the quarter to obtain an average. Once the percent-reporting figures are obtained for all 4 quarters, an arithmetic mean of the 4 quarters is used to represent the average quarterly estimate. Annual expenditure means are computed

by first summing up the total for an expenditure, such as health insurance premiums, for a given quarter, then annualizing the sum, and dividing by the number of consumer units reporting the expense. For each collection year, an arithmetic mean of the 4 quarters is used to represent an annual average.[7]

The expenses examined are total health care outlays and its associated components: health insurance, medical services, prescription drugs, and medical supplies. Nonprescription drugs, nonprescription vitamins, topicals and dressings, and medical equipment repair are not included in this study because these expenses are collected from Diary Survey respondents only.

Health insurance includes premiums paid by consumers for private health insurance and Medicare. Private insurance includes coverage obtained individually or through a group plan sponsored by an employer or other organization. Medicare outlays are premiums paid for Medicare Part B and Medicare Part D coverage. Medicare Part B (Medical Insurance) helps cover physicians' services and outpatient care and Medicare Part D covers prescription drugs.[8]

Medical services include physicians', dental, eye care, and other professional services;[9] inpatient hospital care; lab tests and x-rays; other medical care services, such as hospital outpatient and emergency room care; and nursing home care. The prescription drug spending category is for outlays that are not connected to inpatient hospitalization. Medical supplies include the purchase of hearing aids,

eyeglasses and contact lenses, and the purchase or rental of medical equipment for general use. For each year examined, findings will be reported for the total sample and by the age of the reference person.

Findings

In 2008, nearly 78 percent of Interview Survey respondents reported making health care expenditures during a quarter, compared with 78.6 percent in 2003 and 80.4 percent in 1998. The proportion reporting expenses ranged from 42.3 percent among consumer units with a reference person under 25 years old to 95.3 percent among consumer units with a reference person 65 years and older in 2008; similar patterns were found for 1998 and 2003, as chart 1 indicates. As table 1 shows, among those with health care expenditures, in all years, average total expenditures increased with the age of the reference person up to 45–54 years and then declined. However, in all years, average total health care expenditures, in dollars and as a proportion (or share) of total annual expenditures, generally increased with age.

The proportion of total annual expenditures represented by health care went from 6.2 percent in 1998 to 6.8 percent in 2003 and was virtually the same at 6.7 percent in 2008. Chart 2 shows that these averages varied among age groups. For example, among consumer units with a reference person age 25–34, the proportion of total annual expenditures represented by health care was 4.8 percent in 2008, compared with 4.6 percent in 2003 and 4.4 percent in 1998. Among consumer units with a reference person 65 years and older, the proportion of annual expenditures represented by health care went from 12.6 percent in 1998 to 13 percent in 2003, but was about the same (12.9 percent) in 2008.

Health care component shares changed between 1998 and 2008. Health insurance premiums increased from about 52 percent of health care outlays in 1998 to nearly 58 percent in 2008. The most pronounced change was among consumer units with a reference person under 25 years old;

[5] Because of the rotating panel design of the Interview Survey, a collection year is different from a calendar year. For example, data for the first quarter of calendar year 2008 were collected in January, February, and March. Respondents interviewed in January were asked to recall expenditures made since the first of the month 3 months prior to the interview, resulting in a reference period between Oct.1, 2007, and Dec. 31, 2007. Similarly, respondents interviewed in February would have a reference period from Nov, 1, 2007, to Jan. 31, 2008. This means that respondents interviewed in January who were also interviewed in April, July, and October would have provided 4 quarters worth of data in collection year 2008. However, the data would cover a combined period from Oct. 1, 2007, to Sept. 30, 2008, the last 3 months of calendar year 2007, and the first 9 months of calendar year 2008. For more information see "2008 Consumer Expenditure Interview Survey Public Use Microdata: User's Documentation," October 15, 2009, available online at **http://www.bls.gov/cex/2008/csxintvw. pdf**. (visited August 4, 2010.)

[6] For more information, see "2008 Consumer Expenditure Interview Survey Public Use Microdata: User's Documentation," October 15, 2009, available online at **http://www.bls.gov/cex/2008/csxintvw. pdf**. (visited August 4, 2010).

[7] Annual pretax income and total consumption figures were derived in the same manner as the health expenditure means figures.

[8] For more information, see "Medicare and You: 2010," Centers for Medicare and Medicaid Services, Baltimore, MD, available online at **http://www.medicare.gov/navigation/ medicare-basics/medicare-benefits/part-b. aspx**. (visited August 4, 2010.)

[9] Spending on other professional services includes those provided by health professionals other than physicians, dentists, and optometrists. Among those professionals are chiropractors, acupuncturists, marriage counselors, nurse practitioners, podiatrists, physical therapists, psychologists, substance abuse professionals, and (certified) medical massage therapists.

health insurance was 47.9 percent of health care spending in 1998, compared with 59.1 percent in 2008. Despite this percentage increase, these consumer units still spent substantially less on health insurance than other groups. For consumer units with a reference person 65 years and older, the proportion of the health care budget represented by health insurance was similar in 1998 and 2003, 56 and 55.8 percent, respectively, but was higher (63.5 percent) in 2008. (See chart 3 and table 1.)

Spending on medical services dropped from 31.1 percent of total health care spending in 1998 to 25.9 percent in 2008. The largest declines were for groups with a reference person under age 55. One reason may be increased enrollment in managed care plans, particularly preferred provider organizations (PPOs), which tend to have lower out-of-pocket costs than traditional fee-for-service (FFS) plans. Additional analysis of the insurance coverage of sample consumer units provides some support for this conclusion.

Table 2 presents information about sample consumer units with private coverage under a health maintenance organization (HMO), a PPO, or an FFS plan, and with Medicare Part B coverage. The proportions add up to more than 100 percent because some consumer units have members covered under different plans. For example, a married respondent may have private coverage under an HMO plan, but the respondent's spouse may have coverage under Medicare Part B. In 1998, 26.4 percent of the sample reported having an FFS plan, compared with 14.8 percent in 2003 and 13.4 percent in 2008. Although FFS coverage declined among all groups, consumer units with a reference person age 55–64 reported the greatest proportion of FFS coverage in all years surveyed.

For consumer units with a reference person 65 years and older, PPO coverage was higher in 2008 than in

1998—15.0 percent compared with 9.3 percent—but it still represented the lowest participation rate of all groups. Similarly, FFS coverage for the 65-and-older group dropped from 27.2 percent in 1998 to 14.2 percent in 2003 and 2008, but it was still the second highest among all groups.

Prescription drug spending increased from 13.1 percent of health care outlays in 1998 to 15.9 percent in 2003, with all age groups experiencing increases. Between 2003 and 2008, overall prescription drug spending decreased to 13 percent of health care outlays, with all age groups showing declines, except those with a reference person age 35–44. The greatest decline during the period was for the 65-and-older group, attributable to the introduction of Medicare Part D.[10] Medical supplies, a small proportion of health care spending, declined for the sample as a whole, from 4.3 percent in 1998 to 3.2 percent in 2008.

Conclusions and implications

Among respondents with expenses, the proportion of annual expenditures for health care increased between 1998 and 2003, but was unchanged in 2008. Whether this pattern will continue is uncertain because of the recession that began in December 2007. If poor economic conditions suppressed health care spending in 2008, then increased health care outlays relative to total consumption expenses are possible in

the future.[11]

The share of total health care spending accounted for by various components changed during the period. In 2008, the share of health care spending accounted for by health insurance premiums had increased while the share accounted for by medical services had decreased relative to 1998, possibly due to increased enrollment in managed care plans.

The age of the reference person had an effect on health care spending. For example, the greatest decline in prescription drug spending was found for the 65-and-older group. However, increased spending on health insurance premiums resulted in virtually no change in the proportion of annual expenditures allocated to health care among this group.[12]

■

[10] Additional analysis of 2008 data found that 37.6 percent of consumer units with a reference person 65 years and over had one or more members with Medicare Part D coverage. Existing research has found that Medicare Part D coverage reduced user cost among the elderly in 2006. For more information, see Schneeweis, Sebastian, Amanda R. Patrick, Alex Pedan, Laleh Varasteh, Raisa Levin, and William H. Shrank, "The Effect of Medicare Part D Coverage on Drug Use and Cost Sharing Among Seniors without Prior Drug Benefits," *Health Affairs*, February 2009, pp. w305–w316, and Lichtenberg, Frank R. and Shawn X. Sun, "The Impact of Medicare Part D on Prescription Drug Use by the Elderly," *Health Affairs*, volume 26, number 6, November/December 2007, pp. 1735–44.

[11] On September 20, 2010, the National Bureau of Economic Research determined that a trough in business activity occurred in the U.S. economy in June 2009. The trough marked the end of the recession that began in December 2007 and the beginning of an expansion. For more informa¬tion, see "U.S. Business Cycle Expansions and Contractions," Cambridge, MA, National Bureau of Economic Research, available online at **http://www.nber.org/cycles/cyclesmain.html** (visited October 12, 2010).

An NHEA report indicates that household out-of-pocket health care spending (which excludes insurance premiums and contributions to Medicare) decelerated from 6 percent in 2007 to 2.8 percent in 2008. It was concluded that the slower growth may be because poor economic conditions have forced households to reduce health care spending by forgoing treatment. For more information, see "Sponsors of Health Care Costs: Private Business, Households and Governments, 1987–2008," available online at **www.cms.gov/NationalHealthExpendData/downloads/bhg09.pdf** (visited August 10, 2010).

[12] In 2008, the average Medicare Part D base beneficiary monthly premium was $27.93. The Part B standard monthly premium was $96.40, but there is a higher "income-related" premium for those individuals whose modified adjusted gross income exceeds a specified threshold. For more information, see "2009 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and the Federal Supplementary Medical Insurance Trust Fund," May 12, 2009, Centers for Medicare and Medicaid Services, Baltimore, MD, available online at **http://www.cms.hhs.gov/ReportsTrustFunds/** (visited August 10, 2010).

Table 1. **Average income before taxes, annual expenditures, total health care; total health care spending shares of annual expenditures; health insurance, medical services, prescription drugs, and medical supplies share of total health care spending, by age of reference person, 1998, 2003, and 2008**

Item	All consumer units			Under 25			25–34		
	1998	2003	2008	1998	2003	2008	1998	2003	2008
Income before taxes	$44,576	$54,949	$69,465	$22,118	$28,026	$39,415	$46,559	$56,182	$68,333
Average annual expenditures	$35,592	$42,435	$53,785	$22,210	$27,966	$36,467	$36,942	$42,664	$53,167
Total health care	$2,204	$2,882	$3,591	$922	$1,283	$1,449	$1,613	$1,953	$2,533
Share of average annual expenditures	6.2	6.8	6.7	4.2	4.6	4.0	4.4	4.6	4.8
Health insurance	$1,134	$1,563	$2,080	$442	$666	$856	$840	$1,151	$1,498
Medical services	685	766	931	330	426	392	585	571	745
Prescription drugs	289	458	468	102	143	158	127	176	217
Medical supplies	96	95	113	48	48	43	62	54	73
Shares of total health care									
Health insurance	51.5	54.2	57.9	47.9	51.9	59.1	52.0	59.0	59.1
Medical services	31.1	26.6	25.9	35.8	33.2	27.0	36.3	29.2	29.4
Prescription drugs	13.1	15.9	13.0	11.0	11.1	10.9	7.8	9.0	8.6
Medical supplies	4.3	3.3	3.1	5.2	3.7	2.9	3.8	2.8	2.9

SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

Table 1. **Average income before taxes, annual expenditures, total health care; total health care spending shares of annual expenditures; health insurance, medical services, prescription drugs, and medical supplies share of total health care spending, by age of reference person, 1998, 2003, and 2008**—Continued

Item	35–44			45–54		
	1998	2003	2008	1998	2003	2008
Income before taxes	$55,180	$66,621	$86,709	$62,178	$72,653	$88,961
Average annual expenditures	$42,689	$50,160	$64,195	$45,492	$52,952	$64,746
Total health care	$1,975	$2,589	$3,022	$2,323	$2,900	$3,442
Share of average annual expenditures	4.6	5.2	4.7	5.1	5.5	5.3
Health insurance	$1,012	$1,436	$1,730	$1,088	$1,443	$1,837
Medical services	705	801	881	879	912	1,056
Prescription drugs	166	270	324	241	426	419
Medical supplies	91	82	87	114	120	130
Shares of total health care						
Health insurance	51.3	55.5	57.2	46.8	49.7	53.4
Medical services	35.7	30.9	29.2	37.8	31.4	30.7
Prescription drugs	8.4	10.4	10.7	10.4	14.7	12.2
Medical supplies	4.6	3.2	2.9	4.9	4.1	3.8
	55–64			65 and older		
	1998	2003	2008	1998	2003	2008
Income before taxes	$45,288	$60,415	$75,422	$24,095	$30,420	$39,683
Average annual expenditures	$36,578	$44,844	$57,654	$22,363	$27,848	$36,178
Total health care	$2,411	$3,382	$4,204	$2,812	$3,624	$4,658
Share of average annual expenditures	6.6	7.5	7.3	12.6	13.0	12.9
Health insurance	$1,164	$1,798	$2,268	$1,574	$2,020	$2,956
Medical services	787	898	1,175	587	707	866
Prescription drugs	361	577	632	537	788	697
Medical supplies	98	109	129	114	108	140
Shares of total health care						
Health insurance	48.3	53.2	54.0	56.0	55.8	63.5
Medical services	32.6	26.6	27.9	20.9	19.5	18.6
Prescription drugs	15.0	17.1	15.0	19.1	21.7	15.0
Medical supplies	4.1	3.2	3.1	4.1	3.0	3.0

SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

Table 2. **Percentage enrollment in HMO, PPO, FFS plans, and Medicare Part B, by age of reference person, 1998, 2003, and 2008**

Item	All consumer units			Under 25			25–34			35–44		
	1998	2003	2008	1998	2003	2008	1998	2003	2008	1998	2003	2008
HMO	52.2	45.5	36.0	47.6	39.4	38.4	67.8	56.2	40.5	61.3	50.8	40.6
PPO	23.0	30.2	32.5	24.1	30.3	27.7	26.2	36.6	38.8	27.6	36.2	37.8
FFS	26.4	14.8	13.4	21.2	14.1	10.5	22.1	10.9	10.9	21.0	13.4	11.3
Medicare Part B	28.7	27.3	31.1	1.9	2.1	4.8	2.4	2.9	3.9	5.2	5.4	6.5

Item			45–54			55–64			65 and older		
			1998	2003	2008	1998	2003	2008	1998	2003	2008
HMO			59.1	54.9	37.6	54.1	47.7	39.5	28.1	26.2	25.4
PPO			30.7	37.5	40.4	25.8	34.2	37.2	9.3	12.4	15.0
FFS			31.4	15.9	14.7	34.1	20.2	15.6	27.2	14.2	14.2
Medicare Part B			6.7	7.8	10.6	19.9	19.2	24.4	93.2	86.1	93.4

SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

Chart 1. **Average percent reporting health care expenditures by age of reference person, 1998, 2003, and 2008**
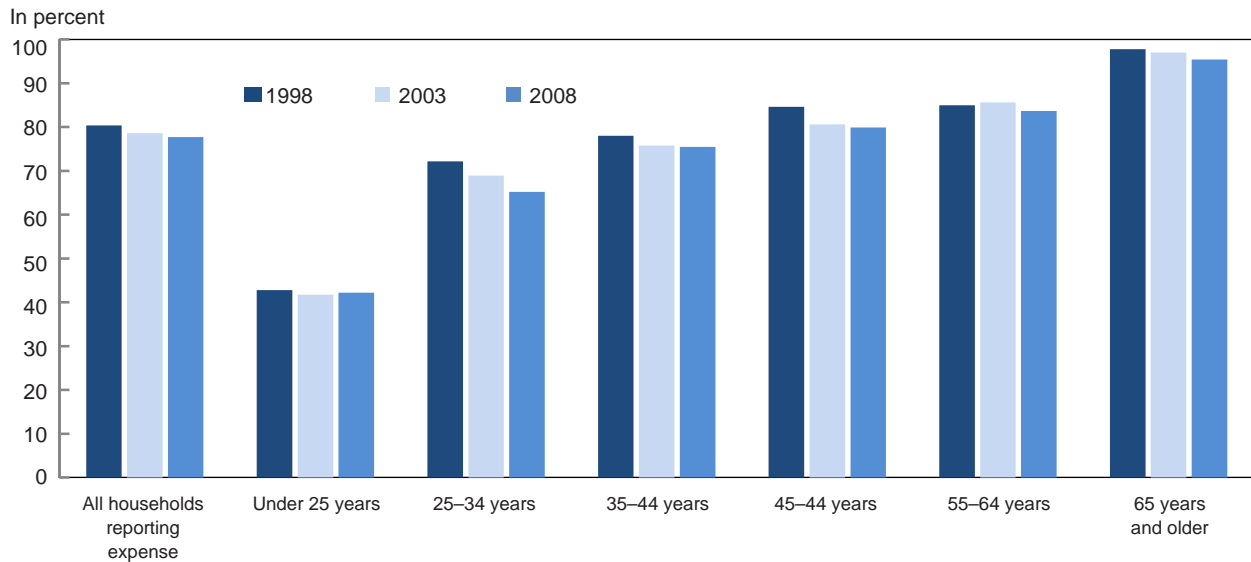
SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

Chart 2. **Average health care spending shares of total annual expenditures by age of reference person, 1998, 2003, and 2008**

In percent
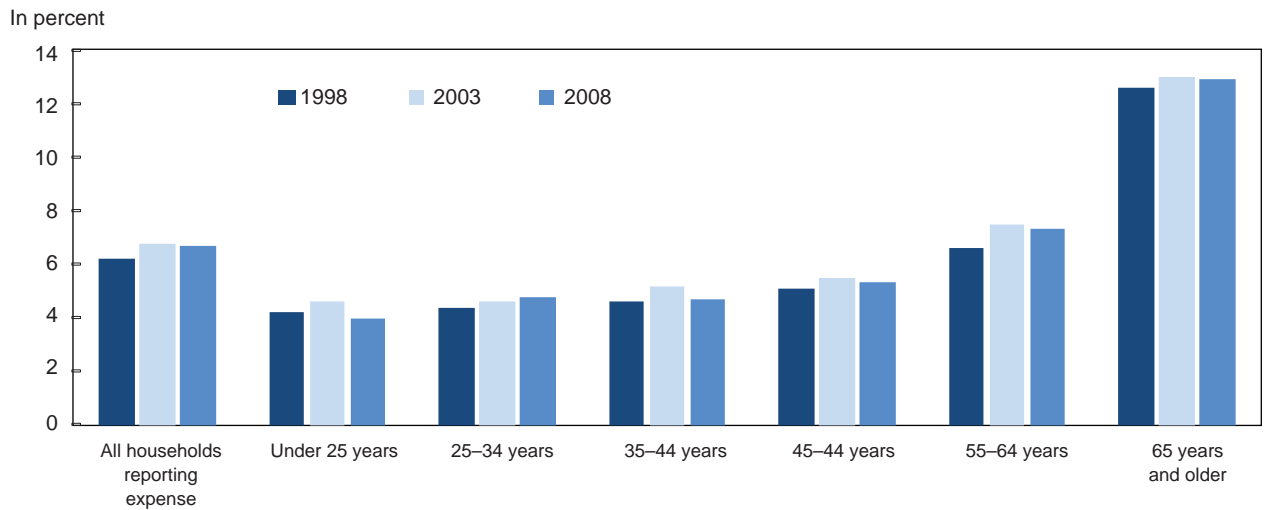
SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

Chart 3. **Distribution of total health care spending, by type of expense, 1998, 2003, and 2008**

In percent
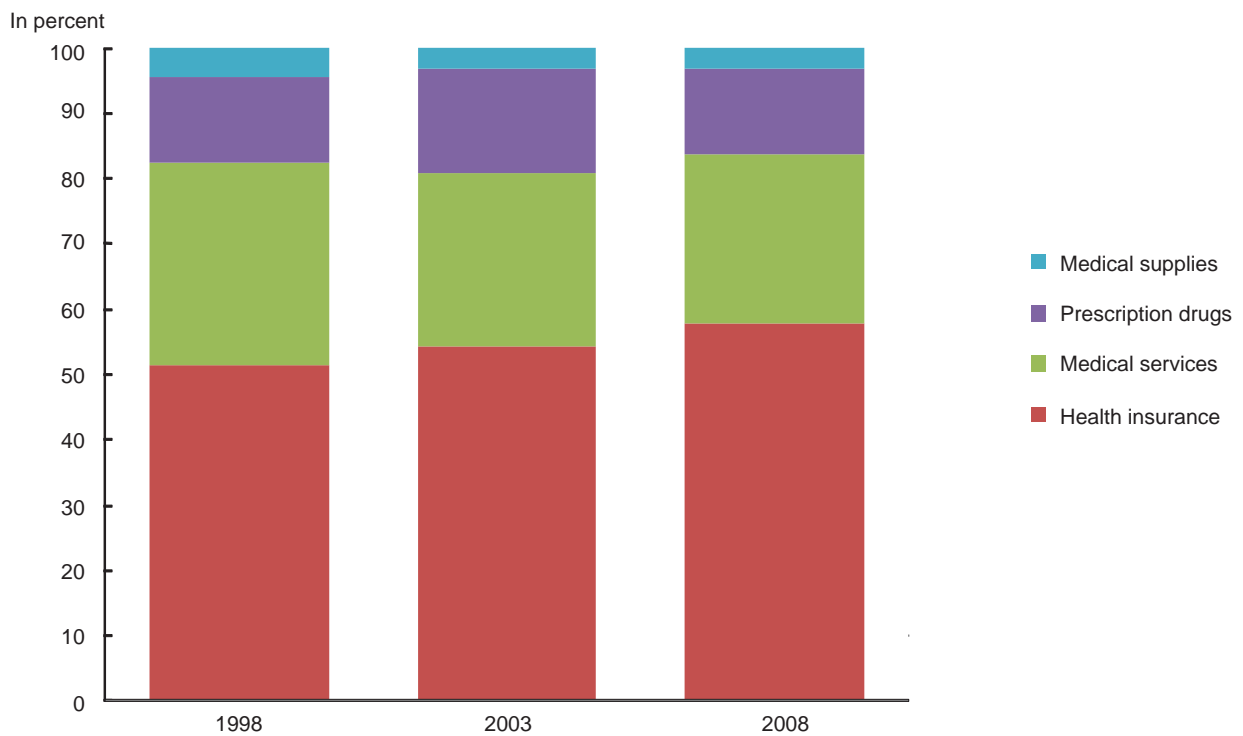
SOURCE: U.S. Bureau of Labor Statistics, Consumer Expenditure Interview Survey

How Consumers Used the 2008 Tax Rebates: Spending, Saving, or Paying Off Debt

GEOFFREY PAULIN

In May 2008, the Internal Revenue Service (IRS) started mailing Economic Stimulus Payments (also called tax rebates) to more than 130 million income tax filers.[1] In June 2008, the Interview component of the Consumer Expenditure Survey (CE) started collecting information on receipt and use of these payments, a process that continued through March 2009. Information, such as amount of payment received, form in which it was received (electronic funds transfer or check), and how payment was used (mostly for spending, saving, or paying off debt) was collected. (The appendix at the end of this article shows the questions as asked in the survey.) This report examines the data collected to find out what types of consumers received payments, the form(s) in which they were received, and how payments generally were used by consumers.

The payments

For those who owed taxes, most were eligible to receive a maximum of $600 per filer, or $1,200 for married couples filing jointly. Filers with no net tax liability but at least $3,000 in qualifying income were eligible for payments of half these amounts (that is, $300 per

filer, or $600 for married couples filing jointly). In each case, recipients were eligible to receive an additional $300 for each child who was younger than 17 years old on December 31, 2007.[2] However, payments were phased out for higher income filers, starting at $75,000 in adjusted gross income for singles, and $150,000 for married couples filing jointly. For every dollar over the limit, stimulus payments were reduced by 5 cents. For example, a married couple with two qualifying children and $160,000 in adjusted gross income would be eligible to receive $1,300 in payments.[3]

The data

Nearly 7,000 consumer units (see glossary) were interviewed each quarter during the collection period, which ran from June 2008 through March 2009. Although the total sample in each of these four quarters was over 27,500, only half were unique consumer units, because some units were visited more than once. Of these, more than 5,600 provided information on receipt of the payment, and over 5,300 provided information on use of the payment. (See tables.)

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[1] Facts about the Economic Stimulus Payments," **http://www.irs.gov/newsroom/article/0,,id=179095,00.html**, FS-2008–15, February 2008, last reviewed or updated: 12 Dec 2008 (December 12, 2008), visited 8/24/2009.

[2] Economic Stimulus Payment Q&As: Eligibility," **http://www.irs.gov/newsroom/article/0,,id=179181,00.html**, initially updated July 16, 2008; last reviewed or updated: 12 Dec 2008 (December 12, 2008), visited 8/24/2009.

[3] *Ibid.*, visited 8/24/2009.

Findings

Amounts received. For those receiving at least one stimulus payment, the amount reported ranges from $6 to $4,800, with an average of $958. (See table 1.) Amounts varied as expected with demographic characteristics. For example, consumer units with qualifying children received more, on average, than their counterparts without children. (See table 2.) The average received rises with age of reference person (see glossary) through the 35-to-44-year-old group, and then declines. (See table 3.) Generally, the amount also rises with income, peaking for the $70,000-and-over range. (See table 4.) For both age and income, the number of earners in the consumer unit follows a pattern similar to the amount of rebate received, although number of earners peaks for those aged 45 to 54 years, instead of for those aged 35 to 44 years. However, the amount received follows the age and income patterns for qualifying children; that is, number of persons less than 18 also peaks for 35- to 44-year olds, and for those with incomes in the highest range. The average size of each rebate is larger for consumer units receiving a single rebate than for those receiving multiple rebates. On average, consumer units receiving one rebate received $910, while consumer units receiving two or more rebates received $1,352. (See table 1.) Therefore, the average rebate for those receiving two or more is less than $676 (that is, less than $1,352 divided by 2).

In general, there was little difference in the average amount of the rebate received for those who mostly spent ($926) or saved ($936) it. (See table 5.) However, those who used the payment mostly to pay off debt had larger rebates, on average ($995), than the others.

The aggregate amount of all tax rebate receipts reported in the CE, $94.6 billion, closely matched the $95.7 billion total of all tax rebates reported by the Internal Revenue Service.

Use of the rebate. Nearly half (49 percent) of recipients reported using the rebate mostly to pay off debt. (See chart 1.) Recipients of multiple rebates were a little more likely (53 percent) to use the payment in this way than recipients of one rebate (49

Table 1. **Number of tax rebates reported, Consumer Expenditure Interview Survey, June 2008–March 2009**					
Item	All consumer units	No rebate reported	At least one rebate reported	One rebate reported	Two or more rebates reported
Sample size	13,803	8,151	5,652	5,032	620
Income before taxes	$63,197	$63,937	$62,128	$60,857	$72,446
Age of reference person	48.5	47.3	50.3	50.4	49.5
Average number in consumer unit:					
Persons	2.5	2.4	2.6	2.6	3.1
Children under 18	.6	.6	.7	.7	.7
Earners	1.3	1.2	1.4	1.3	1.8
Rebate information:					
Average amount received	$392	$0	$958	$910	$1,352
Percent distribution:					
Receiving no rebate	59.1	100.0	0.0	0.0	0.0
Receiving one rebate	36.5	0	89.0	100.0	0
Receiving two or more rebates	4.5	0	11.0	0	100.0
Rebate reporters only					
Receiving at least one rebate by:					
Check	60.5	0	60.5	59.3	69.8
Electronic funds transfer (EFT)	40.0	0	40.0	39.0	48.1
No information (invalid blank)	1.9	0	1.9	1.7	3.1
Asked how rebate was used:	94.7	0	94.7	94.5	96.8
If asked how rebate was used:					
Rebate was used mostly for:					
Spending	30.2	0	30.2	30.5	28.2
Saving	17.6	0	17.6	18.0	14.5
Paying off debt	49.1	0	49.1	48.6	52.8
No information (invalid blank)	3.0	0	3.0	2.9	4.5

Item	All consumer units	Husband and wife, at least one qualifying child	Single parent, at least one qualifying child	Husband and wife only	Single person, 18 years or older [1]	All other consumer units
Table 2. Tax rebate data, classified by presence of qualifying child, Consumer Expenditure Interview Survey, June 2008–March 2009						
Sample size	13,803	2,817	845	2,943	4,094	3,104
Income before taxes	$63,197	$94,280	$35,575	$75,895	$32,450	$71,020
Age of reference person	48.5	39.4	38.1	57.8	51.1	47.4
Average number in consumer unit:						
Persons	2.5	4.1	3.0	2.0	1.0	3.3
Children under 18	.6	2.0	1.8	0	0	.6
Earners	1.3	1.8	1.0	1.2	.6	1.9
Rebate information:						
Average amount received	$392	$646	$318	$453	$170	$417
Percent distribution:						
Receiving no rebate	59.1	54.9	63.6	53.7	66.5	56.8
Receiving one rebate	36.5	41.1	34.6	41.7	32.7	32.7
Receiving two or more rebates	4.5	4.0	1.9	4.6	.8	10.5
Rebate reporters only						
Receiving at least one rebate by:						
Check	60.5	48.5	64.9	63.5	61.9	66.2
Electronic funds transfer (EFT)	40.0	51.0	35.1	35.8	36.8	38.0
No information (invalid blank)	1.9	1.6	1.9	1.7	2.2	2.1
Asked how rebate was used	94.7	94.2	90.6	96.8	93.4	95.4
If asked how rebate was used: Rebate was used mostly for:						
Spending	30.2	28.7	26.9	31.9	31.9	29.0
Saving	17.6	15.0	6.1	23.3	21.4	13.0
Paying off debt	49.1	53.8	65.2	41.7	43.6	54.4
No information (invalid blank)	3.0	2.5	1.8	3.1	3.2	3.6

[1] For this table, single persons 18 years and older are assumed to qualify for the rebate. However, information on tax status is not available in the data examined. Therefore, some of these persons may be claimed as dependents on another tax return, and, as such, are ineligible.

percent). (See table 1.) Less than one-third (30 percent) of recipients reported mostly spending the rebate, and less than one-fifth (18 percent) reported mostly saving the rebate. The remainder (3 percent) did not know or refused to report how the rebate was mostly used.

In one way, the youngest consumers (those under 25) were more like older consumers (those aged 55 and older) than those closer to their own age. (See table 3.) About one third (34 percent) of the youngest consumer units spent the rebate, while fewer

(25 to 30 percent) of those aged 25 to 54 did. However, well over half of those aged 25 to 54 used the rebate to pay off debt, compared with well under half for those aged under 25 or 55 and older; for the latter group, this use appears to decrease with age, because for those 75 and older, only one-third (33 percent) used the rebate to pay off debt. The oldest group was also the most likely to save the rebate (31 percent). They were followed by the second oldest group (23 percent). Those under 65 were less likely to save the rebate (13 to 17 percent).

Consumer units with at least one parent and at least one qualifying child were about two to two-and-one-half times more likely to use the rebate to pay off debt than they were to spend it. (See table 2.) However, single parents (6 percent) were less likely to save the rebate than husband and wife families with children (15 percent). Similar consumer units without children (husband and wife only or single person 18 or older) were similar to each other in their propensities to allocate these funds: Less than one third spent the rebate;

Table 3. Tax rebate data, classified by age of reference person, Consumer Expenditure Interview Survey, June 2008–March 2009

Item	All consumer units	Under 25 years	25–34 years	35–44 years	45–54 years	55–64 years	65–74 years	75 years and older
Sample size	13,803	1,094	2,304	2,671	2,832	2,217	1,397	1,288
Income before taxes	$63,197	$26,617	$58,841	$77,506	$82,804	$71,700	46,300	$32,964
Age of reference person	48.5	21.4	29.5	39.6	49.4	59.2	69.0	81.6
Average number in consumer unit:								
Persons	2.5	1.9	2.8	3.3	2.8	2.1	1.8	1.5
Children under 18	.6	.3	1.1	1.4	.6	.2	.1	(1)
Earners	1.3	1.3	1.5	1.6	1.7	1.3	.6	.2
Rebate information:								
Average amount received	$392	$186	$425	$500	$421	$385	$349	$282
Percent distribution:								
Receiving no rebate	59.1	77.2	60.5	57.9	58.4	57.3	53.2	54.4
Receiving one rebate	36.5	19.3	35.5	38.1	36.7	36.9	41.7	42.2
Receiving two or more rebates	4.5	3.5	4.0	4.0	4.9	5.8	5.1	3.3
Rebate reporters only								
Receiving at least one rebate by:								
Check	60.5	65.1	50.7	54.9	57.1	62.6	71.3	75.5
Electronic funds transfer (EFT)	40.0	37.8	50.3	45.1	43.2	37.4	29.1	24.9
No information (invalid blank)	1.9	1.6	1.2	2.0	2.5	2.2	1.5	1.4
Asked how rebate was used:	94.7	87.6	90.6	94.6	95.8	96.5	97.4	96.3
If asked how rebate was used:								
Rebate was used mostly for:								
Spending	30.2	33.9	25.0	29.7	26.5	33.3	36.6	32.7
Saving	17.6	12.8	15.0	13.3	15.4	17.2	22.8	30.8
Paying off debt	49.1	47.7	57.5	54.2	55.3	46.2	37.5	33.1
No information (invalid blank)	3.0	5.5	2.5	2.7	2.7	3.4	3.1	3.4

1 Less than 0.05.

more than one fifth saved it; and most of the rest used it to pay off debt. A small portion, 3 percent in each case, did not report usage.

For income, there is no discernable relationship between the propensity to allocate and the level of income. (See table 4.) In each income group where use questions were asked, about one half (46 to 54 percent) used it to pay off debt, with more than one fourth to more than one third (28 to 35 percent) mostly spending, and most of the rest (15 to 20 percent) mostly saving the rebate. Between 2 and 4 percent did not know or refused to report use of the rebate.

Percent reporting. Most of those reporting receipt of a rebate reported receipt of only one rebate. However, a substantial portion—nearly 1 in 9 (11 percent)—reported receipt of two or more rebates. (See table 1.) This is possible when a consumer unit includes more than one tax filer (for example, a husband and wife filing separately; or a retired parent who resides with working children).

Only 23 percent of the youngest consumers—those under age 25—received any rebate, compared with nearly half (46 to 47 percent) of consumers who were age 65 or older. (See table 3.) There is little variation in percent

reporting at least one rebate for those aged 25 to 64, although the values reported (40 to 43 percent) are closer to those for older consumers than to that for the youngest consumers. These results may have been influenced by the composition of the sample. More than half (55 percent) of those whose reference person is under 25 completed only one in the series of four quarterly interviews, compared with about one third (34 to 35 percent) of those at least 55 years old. (See chart 2.) Similarly, the percent completing all four interviews is more than double (9 to 11 percent) the rate for those at least 55 and older than it is for those under 25

Table 4. **Tax rebate data, classified by income before taxes, Consumer Expenditure Interview Survey, June 2008–March 2009**

Item	All consumer units	Less than $5,000	$5,000 to 9,999	$10,000 to 14,999	$15,000 to 19,999	$20,000 to 29,999	$30,000 to 39,999	$40,000 to 49,999	$50,000 to 69,999	$70,000 and more
Sample size	13,803	564	668	911	877	1,678	1,400	1,258	2,033	4,414
Income before taxes	$63,197	–$758	$7,689	$12,461	$17,331	$24,752	$34,522	$44,644	$59,118	$130,229
Age of reference person	48.5	40.3	47.5	55.2	54.1	52.3	48.6	47.1	46.7	47.0
Average number in consumer unit:										
Persons	2.5	1.7	1.6	1.7	1.9	2.1	2.3	2.5	2.7	3.1
Children under 18	.6	.4	.3	.4	.5	.5	.6	.7	.7	.9
Earners	1.3	.5	.4	.5	.6	.8	1.1	1.3	1.6	1.9
Rebate information:										
Average amount received	$392	$133	$116	$160	$236	$300	$354	$441	$507	$527
Percent distribution:										
Receiving no rebate	59.1	81.0	77.8	68.7	62.1	57.6	56.9	52.7	52.0	57.0
Receiving one rebate	36.5	17.0	21.1	29.6	35.6	38.8	40.1	42.3	41.1	37.0
Receiving two or more rebates	4.5	2.0	1.0	1.6	2.3	3.6	3.0	5.0	6.8	6.0
Rebate reporters only										
Receiving at least one rebate by:										
Check	60.5	67.3	71.6	77.9	72.0	67.5	65.5	60.5	56.1	52.5
Electronic funds transfer (EFT)	40.0	32.7	27.7	21.4	28.3	31.5	33.7	39.8	44.3	16.5
No information (invalid blank)	1.9	3.7	2.0	1.4	1.5	2.4	2.0	1.2	2.5	1.6
Asked how rebate was used	94.7	95.3	93.9	93.7	94.0	92.5	94.9	94.1	95.1	95.8
If asked how rebate was used:										
Rebate was used mostly for:										
Spending	30.2	33.3	30.2	34.8	29.8	31.0	28.7	28.6	28.5	31.1
Saving	17.6	16.7	15.1	17.6	15.7	19.6	16.1	15.9	15.6	19.5
Paying off debt	49.1	48.0	50.4	45.7	52.2	45.9	51.0	53.6	52.2	46.6
No information (invalid blank)	3.0	2.0	4.3	1.9	2.2	3.5	4.2	2.0	3.7	2.8

(4 percent). This is worth noting because participation in more interviews over time means more opportunity to report receipt of at least one rebate. At any rate, regardless of age, only 3 to 6 percent reported receipt of more than one rebate. (See table 3.)

The presence of a qualifying child did little to change the probability of reporting at least one rebate: For single persons, the presence of a qualifying child raises the probability of reporting a rebate by only 3 percentage points; for husband and wife consumer units, the probability actually fell by about 1 percentage point. (See table 2.) Presumably, this is because the presence of a qualifying child affected the amount of the payment, but not the eligibility to receive one, when two otherwise identical consumer units were compared. As expected, amount received is larger for consumer units with at least one qualifying child, as noted previously.

Surprisingly, the percent reporting at least one rebate increased with income

Table 5. Use of tax rebate (for those asked only), Consumer Expenditure Interview Survey, June 2008–March 2009

Item	Rebate use asked	Rebate used mostly for spending	Rebate used mostly for saving	Rebate used mostly for paying off debt	Rebate use asked, but not reported
Sample size	5,353	1,618	944	2,628	163
Income before taxes	$62,699	$64,013	$65,871	$60,299	$69,972
Age of reference person	50.7	52.0	55.4	48.2	51.3
Average number in consumer unit:					
Persons	2.6	2.5	2.3	2.8	2.5
Children under 18	.7	.6	.4	.8	.5
Earners	1.4	1.3	1.2	1.5	1.4
Rebate information:					
Average amount received	$962	$926	$936	$995	$925
Percent distribution:					
Receiving no rebate	0.0	0.0	0.0	0.0	0.0
Receiving one rebate	88.8	89.6	90.8	87.9	83.4
Receiving two or more rebates	11.2	10.4	9.2	12.1	16.6
Receiving at least one rebate by:					
Check	60.8	62.2	62.1	59.7	55.8
Electronic funds transfer (EFT)	39.8	38.5	37.9	41.9	28.8
No information (invalid blank)	1.9	1.2	1.3	1.4	18.4
Asked how rebate was used:	100.0	100.0	100.0	100.0	100.0
Rebate was used mostly for:					
Spending	30.2	100.0	0	0	0
Saving	17.6	0	100.0	0	0
Paying off debt	49.1	0	0	100.0	0
No information (invalid blank)	3.0	0	0	0	100.0

for respondents with less than $70,000. (See chart 3.) Because all tax payers within the income ranges described previously are equally eligible, the expected outcome is that the relationship would be stable within this range.[4] The explanation for the observed outcome may lie in the fact that low-income families are less likely to participate in all four interviews over time, and, therefore, to have four opportunities to provide information on receipt of the rebate, than are higher-income families. For example, only 4 percent

of consumer units with incomes less than $5,000 participated in all four interviews, compared with 10 percent of those with incomes of $70,000 and more. (See chart 4.) Similarly, 50 percent of those in the lowest income group participated for only one interview during the collection period, compared with 37 percent of the highest income consumer units.

When considering only those who reported at least one rebate, multiple rebate reporting was most frequently observed for the youngest consumers (15 percent), and least frequently observed for the oldest consumers (7 percent). (See table 3.) For those between the ages of 25 and 74, the percent reporting multiple rebates among those who reported at least one rebate ranged from 10 to 14 percent.

Not surprisingly, rebate reporters consisting of a husband and wife with (9 percent) or without (10 percent) at least one qualifying child are more likely to report multiple rebates than either single parents (5 percent) or single persons aged 18 or older (2 percent). (See table 2.)[5] Also, except for the lowest income group (10 percent), the incidence of multiple rebates ranges from 5 to 8 percent of rebate recipients in each income group in the less-than-$40,000 categories, compared with 11 to 14 per-

[4]According to the rules, all eligible tax payers who "file[d] a federal tax return by October 15, 2008" were scheduled to receive the payment ("Basic Information on the Stimulus Payments," updated July 18, 2008, on the Internet at **http://www.irs.gov/news-room/article/0,,id=179211,00.html**, visited 8/27/2009).

[5] According to table 2, the group of rebate reporters with the highest percent reporting multiple rebates is "all other consumer units" (24 percent). This is expected, since the composition of this group presumably includes consumer unit structures in which multiple tax units plausibly reside, such as a single parent with a working child who is at least 19 years old, and no younger (that is, qualifying) children.

cent of rebate recipients in each income group in the $40,000-or-over categories. (See table 4.)

Method of receipt. The most popular method of receiving the stimulus payment was by check. Well over half (more than 60 percent) of respondents reporting receipt of at least one rebate reported receiving at least one payment by check. (See table 1.) In comparison, 40 percent of recipients reported receiving at least one rebate by electronic funds transfer (EFT); and for 2 percent of the recipients, no information is available on the method for the remaining cases, because the respondent did not know, or refused to report, the information.[6] However, there are marked differences by demographic characteristic. For example, the percent reporting receipt by check increases with age of reference person from about half (51 percent) for

those in the 25-to-34-year-old group to three fourths (75 percent) for those in the 75-and-older group. Those under 25 were comparable with older consumers, with nearly two-thirds (65 percent) reporting receipt by check. The relationship to income is that of an inverted "check mark," rising from about two thirds (67 percent) for the lowest income group to more than three fourths (78 percent) of those in the $10,000 to $14,999 range, and falling to just over half (52 percent) of the highest income range.

Summary

Between June 2008 and March 2009, respondents to the Interview component of the Consumer Expenditure Survey were asked about receipt and use of the 2008 Economic Stimulus Payments (also called tax rebates). Averaging more than $900 for consumer units reporting receipt, nearly half (49 percent) of these consumer units reported using the payments mostly for paying off debt. Less than one third (30 percent) reported using the payments mostly for spending, and less than one fifth (18 percent) reported using the payments mostly for saving. Those who used the payments mostly to pay off debt also received larger rebates, on average, than those who used them mostly for spending or saving.

The use of the rebates varied by demographic characteristics. For example, the majority of consumer units with reference person aged 25 to 54 used the rebates mostly for paying off debt; those with older or younger reference persons were much less likely to do so.

Most respondents (more than 60 percent) reported receiving these payments by check, rather than by electronic funds transfer. Although the percentage changed with age, more than half of each age group examined reported receipt by check (51 percent of those in the 25-to-34-year-old group; 75 percent for those in the 75-and-older group). Presumably, the method of receipt has implications for administrative costs associated with distributing the payments, and is, therefore, of interest to policymakers.

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[6] Values add to more than 100 percent because some recipients received multiple rebates. If at least one was by check and at least one was by EFT, the same recipient is included in both groups.

Chart 1. **Number (and percent) of consumer units and primary use of the 2008 tax rebates**

- Spending
- Saving
- Paying off debt
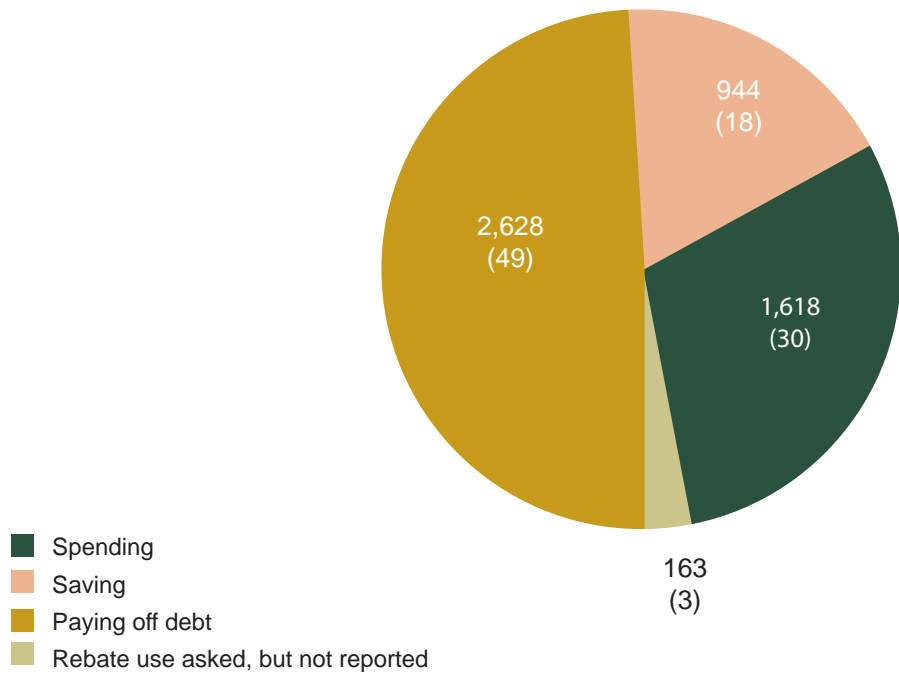- Rebate use asked, but not reported

Chart 2. **Number of interviews completed by age of reference person for 2008 tax rebates**
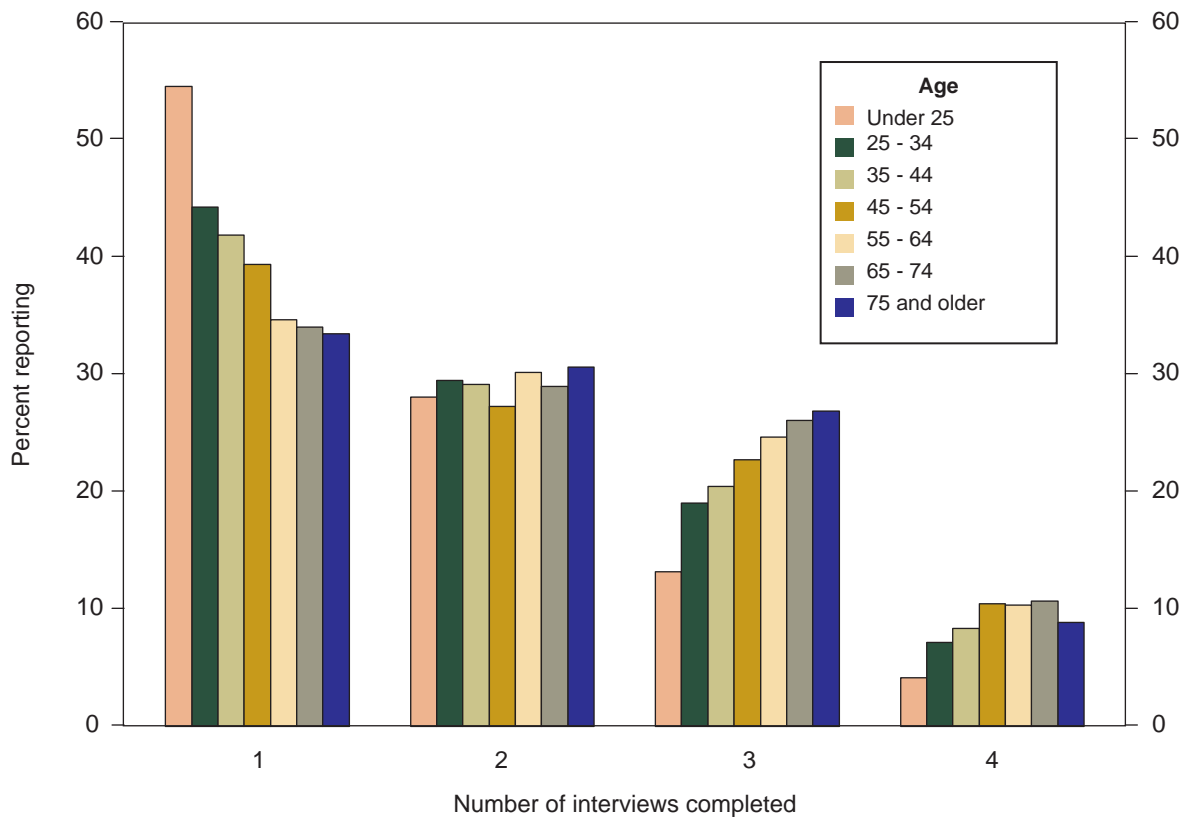
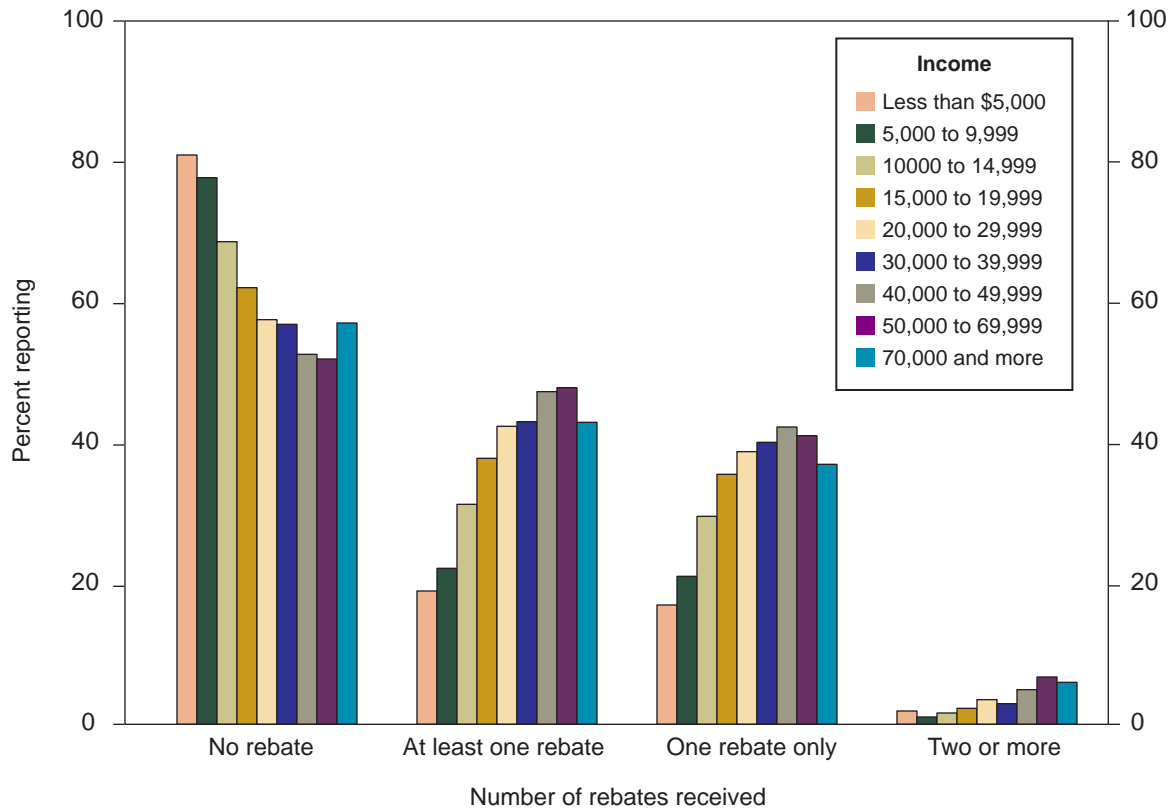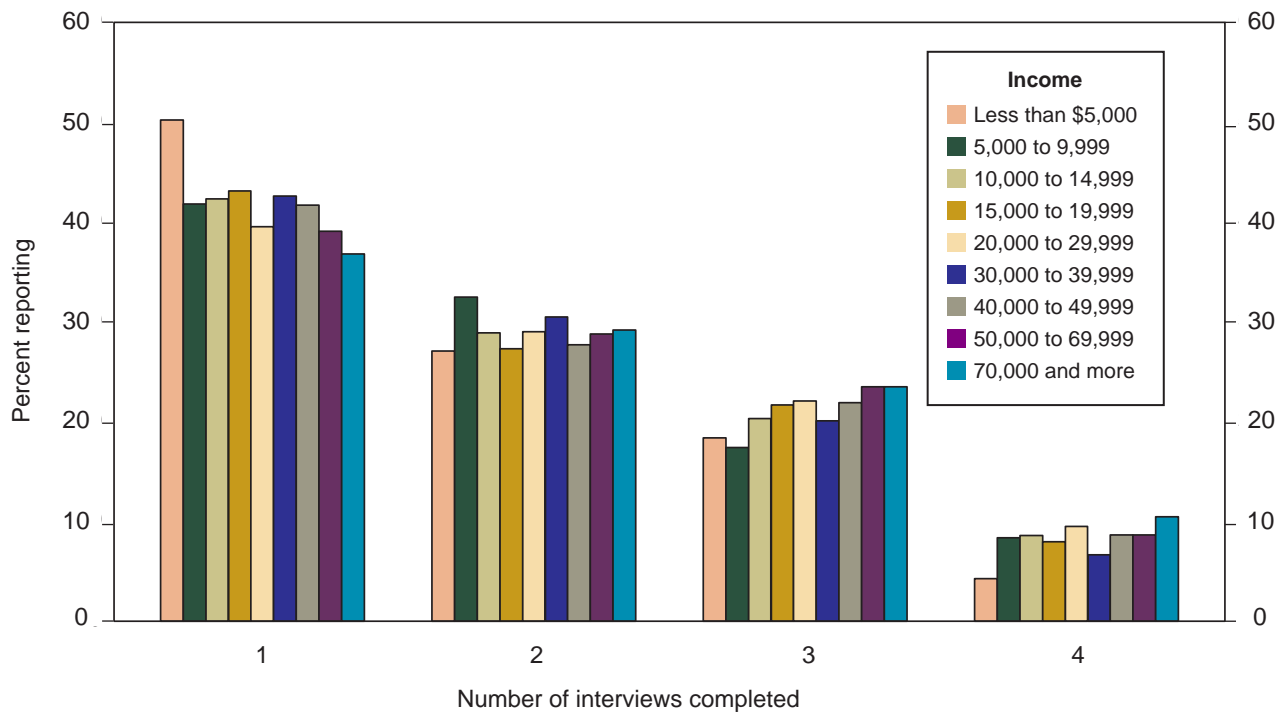Chart 3. **Number of rebates received by income before taxes for 2008 tax rebates**

Chart 4. **Number of interviews completed by income before taxes for 2008 tax rebates**

Technical Note

Data collection. In the usual course of the Interview Survey, an address is visited once per quarter for five consecutive quarters. For the Economic Stimulus Payments, data regarding amount received and method of payment were collected the first time that the consumer unit was interviewed during the collection period (June 2008 through March 2009). In the next completed interview, respondents were asked how they mostly used the funds. When the first interview during the collection period was also the fifth interview for the consumer unit, both sets of questions were asked during the same interview. Nonetheless, there was not always information available regarding both receipt and use. For example, a respondent may have provided receipt information in one interview, but then may not have been available for any subsequent interview, or may not have known or may have refused to provide information about the use of the rebate. In such cases, no information on use of the payment was obtained. In cases where receipt, but no value, of the payment was reported in the first eligible interview, a value based on other available information, such as family composition, was imputed during data processing.

Weighting. Data in this report have not been weighted to reflect the population. Weights used in standard publications are derived through a process in which each interview is treated independently, even though the same consumer unit may be interviewed several times during the course of the survey. However, in this report, information for each consumer unit is linked across interviews when more than one occurred during the period in the collection period. As noted, the number of interviews in which a consumer unit participated ranges from one to four, depending on numerous factors. (For example, consumer units completing their fifth interview in June 2008 or their second interview in March 2009 had no opportunity to answer rebate questions in a later interview, and, therefore, have only one interview on record.) Because the interviews each quarter are not treated independently, and because the number of possible interviews differs across consumer units, weighting was not used in this report.

Appendix

The 2008 economic stimulus payment information was collected in sections 19B and 20B of the Consumer Expenditure Interview Survey questionnaire as shown below. Outside experts were consulted prior to finalizing the questions. The questions on the amount and month of the payment were similar to those from 2001 when tax rebate information was also collected. The questions on how the rebate was used are similar to those in the University of Michigan Survey of Consumers and also in the U.S. Census Bureau Survey of Income and Program Participation 2008 wave 1 supplement.[1]

Section 19B. Earlier this year/Last year the Federal government approved an economic stimulus package. Many households will receive a one-time economic stimulus payment, either by check or direct deposit. Previously you or your CU reported receiving one or more economic stimulus payments. This is also called a tax rebate and is different from a refund on your annual income taxes.

Since the first of the reference month, have you or any members of your CU received a/an additional

  10. Tax rebate? [Economic Stimulus Payment]

  99. None/No more entries

What was the payment/contribution for? [enter text] _____

In what month did you make the payment/contribution? [enter text] _____

* Enter 13 for same payment/contribution each month of the reference period.

What was the total amount of the payment/contribution?/

What is the monthly payment/contribution? [enter value] _____

Did you make any other payments/contributions for this "payment/contribution item"?

  1. Yes
  2. No

Who was the rebate for? [enter text] _____

* Collect each rebate separately and include the name(s) of the recipient(s).

In what month did you receive the rebate? [enter text] _____

What was the total amount of the rebate? [enter value] _____

* Probe if the amount is not an expected increment such as $300, $600, $900, $1,200, etc.

Was the rebate received by - ?

1. check?
2. direct deposit?

Did you or any members of your CU receive any other tax rebate [economic stimulus payment]?

  1. Yes
  2. No

Section 20B. Earlier in this interview/Last interview/Previously you or your CU reported receiving a one-time tax rebate that was part of the Federal government's economic stimulus package. Did the rebate lead you or your CU mostly to increase spending, mostly to increase savings, or mostly to pay off debt?

* Select the category that best describes how the rebate was mostly used.

  1. mostly to increase spending

  2. mostly to increase saving

  3. mostly to pay off debt

[1] Section 19B http://www.bls.gov/cex/capi/2008/csxsection19b.htm (visited 4/28/2011). Section 20B http://www.bls.gov/cex/capi/2008/csx-section20b.htm (visited 4/28/2011).

Household spending by single persons and married couples in their twenties: a comparison

WILLIAM HAWK

In the United States, persons reaching age 21 enter adulthood facing the challenges and opportunities that come with personal and economic autonomy. Young adults in their twenties traditionally are completing their educational goals, entering the workforce, and making decisions regarding marriage and living arrangements. An earlier *Consumer Expenditure Survey Anthology* article by Geoffrey Paulin noted the relevance of studying persons in their twenties.[1] In the article, Paulin investigated the spending habits of never-married singles ages 21 to 29 years and noted that "For many Americans, the age of 21 is a major point of demarcation in one's life cycle."

Published Consumer Expenditure Survey (CE) data indicate that, compared with average U.S. consumer units (CUs), those headed by persons 25 years or younger earn lower incomes, are less likely to own a home or a car, and spend less on food, gifts, health care, and retirement plans.

They are also more likely to rent a home and spend more on education and alcohol.[2]

The analysis that follows examines demographic characteristics, per-capita incomes, and spending patterns of single and married persons in their twenties. The first section explores how these characteristics, *within* the single and married categories, differ from the early twenties to the late twenties. The second section explores income and spending differences *between* singles and married couples. The analysis uses 2007–08 CE data on single persons ages 21 to 29 years who were never married and on married couples whose reference person[3] is 21 to 29 years and has no children.

The chief findings of the study are as follows:

- Singles in their late twenties spend more and have a higher income than singles in their early twenties.

- The average per-capita income of singles 21 to 23 years is significantly lower than that of married couples in the same age range. The reverse is true of singles and married couples 27 to 29 years.

- Married couples are more likely than singles to be homeowners.

- Singles spend significantly more per capita than married couples do on food, housing, apparel, and education, and less on health care.

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[1] Geoffrey Paulin, "Examining Expenditure Patterns of Young Single Adults in a Historical Context: Two Recent Generations Compared," *Consumer Expenditure Survey Anthology, 2008* (U.S. Bureau of Labor Statistics, December 2008).

[2] See "Table 3. Age of reference person," on the Internet at **http://www.bls.gov/cex/2008/Standard/age.pdf.**

[3] See glossary on page 48 for the BLS definition of "reference person."

Data and methods

Interview survey. The data for this article are from the 2007–08 Interview Survey component of the CE. The Interview Survey contains information on incomes, expenditures, and demographic characteristics of American consumers, collected quarterly from a nationally representative sample of CUs in the U.S. population.

The CE includes two components: the quarterly Interview Survey and the weekly Diary Survey. Published CE tables are created by integrating information from the two surveys. The Interview Survey, which is designed to collect data on major types of expenditures, household characteristics, and income, is used in this study because it provides the most complete picture of spending. Respondents are usually asked to report values for expenditures or outlays that occurred during the three months prior to the interview. The data in this analysis are by collection year, not calendar year, from CUs interviewed in 2007 and 2008. This study employs many of the methods set forth in Paulin's article.

Outlays. The analysis that follows uses outlays, as opposed to expenditures, for comparisons. Outlays are similar to expenditures in that both measures (1) define spending as the transaction cost, including taxes, to obtain goods and services, (2) include spending on gifts for people outside of the CU, and (3) exclude business expenses. The key difference is in the treatment of purchases of real property and vehicles. In the CE, expenditures on purchases of property include only mortgage interest and expenditures on vehicles include the full value of the purchased vehicle, regardless of whether it was or was not financed. By contrast, outlays include both the principal and interest portions of property on mortgages and vehicle loans. The purchase price of vehicles bought outright and not financed also is included in outlays.

Weights. The CE uses a representative sample to estimate the spending habits of the U.S. civilian noninstitutional population. Estimates shown in this article are calculated with the use of weights. For the 2007–08 Interview Survey, approximately 600 married CUs and 2,200 single CUs provided data for this analysis. These sampled CUs represent nearly 7 million CUs in the population.

Reference groups. Recognizing that 21- to 29-year-olds are not a homogeneous group and that the twenties are a period of lifestyle transition, the analysis examines three distinct groups: those CUs (with reference person) ages 21 to 23 years, those in their midtwenties (24 to 26 years), and those in their late twenties (27 to 29 years). Further restrictions on the age difference between spouses in a married-couple CU follow.

Consumers must be single or married with no children in order to be included in the analysis. To be categorized as a "single" CU, a person must identify him- or herself as single and never married and must be in a CU of size 1. This categorization implies that the person is not living with other blood relatives, is not widowed or divorced, and, if there are other people living in the housing unit, is financially independent (that is, is not making joint financial decisions with his or her housemates). Financial independence is determined by the three major expense categories: housing, food, and other living expenses. To be considered financially independent, the respondent must pay all or part of the consumer unit's expenses in at least two of the three major expense categories.

Examples of singles eligible for this study include a 25-year-old living with three of her friends who makes her own financial decisions and a 21-year-old residing in a college dormitory even if he receives money from his parents each month. In contrast, a 27-year-old living at home with his parents is not counted as single even if he is financially independent.

For the married group, each CU must, of course, be married and must be living in a two-member CU. In order to allow for closer comparisons between singles and couples in the same age group, couples with age differences greater than 4 years between their members are omitted from their respective groups.

An example of a married couple eligible for the study is a married couple, one member of whom is age 27, and the other age 31, with no children. The same couple would be eligible even if the pair rented out their basement to another family. By contrast, any couple whose members

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Groups eligible to participate in the study

Single
      Ages: 21–23; 24–26; 27–29
      CU type: single persons
      CU size: 1
      Marital status: single, never married

Married
      Age of reference person: 21–23; 24–26; 27–29
      Age of spouse: within 4 years of age of reference person
      CU type: husband and wife only
      CU size: 2
      Marital status: married, no children

are, respectively, 22 and 27 years would not be eligible, because their ages differ by more than 4 years. Also ineligible is a couple living in the home of the reference person's parents, regardless of the members' ages and financial independence.

Results are from the eligibility classification used and were computed on a per-capita basis, unless explicitly stated otherwise. This approach allows for closer comparisons between singles and couples.

Early twenties compared with late twenties

Singles. Sixty-seven percent of singles in their early twenties (21 to 23 years) are enrolled in college either full or part time, 18 percent have earned a bachelor's degree, and 6 percent report owning a home. (See chart 1.)

Singles in their early twenties tend to spend more money, on average, than they earn per year. Table 1 shows that average reported outlays of 21- to 23-year-olds exceed average income by about $5,000 ($21,083 and $16,067).

Lending credence to the view that singles in their twenties are in a transitional period, more of those in their late twenties have bought a home or earned a bachelor's degree. Thirty-five percent of singles ages 27 to 29 years report owning a home, 55 percent have earned a bachelor's degree, and 18 percent are enrolled in college either part time or full time.

The average income of a late-twenties single, $39,757, is almost 2½ times that of an early-twenties single, and the average total outlay of a late-twenties single, $34,889, is well above that of an early-twenties single. Late-twenties singles outspend early-twenties singles in every expenditure category except education.

There are also differences in how singles allocate their outlays. Early-twenties singles spend a larger share of their budgets on food and education and a smaller share on housing and transportation than do late-twenties singles. Food accounts for 18.0 per-

cent, and education 11.0 percent, of outlays for an early-twenties single, whereas food accounts for only 14.6 percent, and education 1.6 percent, for a late-twenties single. Housing accounts for 34.5 percent, and transportation 14.2 percent, of outlays for an early-twenties single; housing makes up 39.0 percent, and transportation 16.6 percent, of outlays for a late-twenties single.

Married couples. For married CUs with reference person ages 21 to 23 years, 17 percent report owning a home, 21 percent have at least one person with a bachelor's degree, and 46 percent have at least one person enrolled in college either part or full time. (See chart 2.) Average per-capita income is $22,986 and average per-capita total outlays are $20,120. (See table 1.)

The twenties are also a transitional age for couples. Of married couples with reference person ages 27 to 29 years, 69 percent report owning their home, 73 percent live in a CU with at least one person with a bachelor's degree, and 29 percent are CUs with at least one member enrolled in college either part or full time. The average per-capita income of the late-twenties married group, $38,182, is 66 percent higher than the average per-capita income of the early-twenties married group, whereas average per-capita total outlays of late-twenties married couples, $26,649, are 32 percent higher than those of early-twenties married couples.

Early-twenties couples spend a larger share of their budgets on food, transportation, and entertainment, and a smaller share on housing, than do late-twenties couples. Food accounts for 15.4 percent, transportation 21.3 percent, and entertainment 6.5 percent of total outlays for an early-twenties couple, whereas food accounts for 13.6 percent, transportation 19.5 percent, and entertainment 5.4 percent for a late-twenties couple. Housing constitutes 30.0 percent of outlays for an early-twenties couple, compared with 35.6 percent for a late-twenties couple.

Singles compared with married couples

Demographics. For the combined single and married-couple groups ages 21 to 29 years, married couples are far more likely than singles to be homeowners. The statistics show that 55 percent of married couples report owning their homes and 84 percent of singles are renters. Sixty-one percent of married CUs and 39 percent of single CUs, have at least one member with a bachelor's degree, and 39 percent of married CUs, compared with 43 percent of single CUs have at least one member currently enrolled in college.

The difference in home ownership rates of singles and married couples is the smallest for 21- to 23-year-olds, compared with 27- to 29-year-olds. For the younger group, 6 percent of singles and 17 percent of couples report home ownership.

The difference in home ownership rates is the largest among 27- to 29-year-olds, with 69 percent of married couples reporting home ownership, compared with 35 percent of singles.

For the 21- to 23-year-olds, 67 percent of singles report that they are enrolled in college and 46 percent of couples report having at least one member enrolled in college. Also, 18 percent of singles have a bachelor's degree, and 21 percent of married persons have at least one member with a bachelor's degree. For the 27- to 29-year-olds, 18 percent of singles report that they are enrolled in college and 29 percent of married persons report having at least one member enrolled in college. Fifty-five percent of singles have a bachelor's degree or higher, and 73 percent of married couples have at least one member with a bachelor's degree or higher.

Income. Married couples ages 21 to 29 have incomes that are, on average, $6,779 more than singles' incomes. Among singles, average income is $16,067 for 21- to 23-year-olds, compared with $39,757 for 27- to 29-year-olds. (See chart 3.) Among married couples, income averages $22,986 for

the younger age group, compared with $38,182 for older married couples. Differences in income between singles and married couples are largest in the early twenties ($6,919) and smallest in the late twenties ($1,575).

Singles in their late twenties with at least a bachelor's degree or higher earn $42,645, and those in their late twenties with a high school diploma or less earn $26,708. Married couples in their late twenties with at least one member with a bachelor's degree or higher earn $40,240 per capita, and late-twenties married couples for which the highest level attained by either member is a high school diploma or less earn $33,169 per capita.

Outlays. For all CUs, ages 21 to 29, average outlays are similar for singles and married couples, with the latter spending $1,532 less. Differences in outlays between singles and married couples are smallest in the early twenties ($963) and largest in the late twenties ($8,240). (See chart 4.)

Spending patterns. For the three age groups combined, singles spend 6 percent more per capita than married couples spend, but married couples earn 25 percent more per capita in income than singles earn. Income and total outlays, however, tell only part of

the story; a focus on how outlays are *allocated* demonstrates the differences in spending patterns of single and married consumers.

For all age groups combined, singles spend a larger share of their budget on food, housing, and education, and a smaller share on transportation and on personal insurance and pensions, than do married couples. Specifically, food accounts for 16.3 percent, housing 36.7 percent, and education 5.7 percent of total outlays for singles, whereas food accounts for 13.1 percent, housing 34.5 percent, and education 2.4 percent for married couples. Transportation makes up 15.6 percent, and personal insurance and pensions 8.9 percent, of total outlays for singles; transportation accounts for 20.0 percent, and personal insurance and pensions 12.7 percent, for married couples.

For each age group, some of the differences in spending shares between singles and married couples are more pronounced than for the three age groups combined. Among 21- to 23-year-olds, singles and married couples allocate their spending quite differently: singles apportion a higher percentage of their outlays to food, alcohol, housing, and education, whereas married couples apportion a higher percentage of their outlays to transportation, health care, and entertainment.

The same result holds for the 27- to 29-year age group; however, for most areas of spending, the difference is smaller. Singles' and married couples' budget shares for food, alcohol, housing, transportation, health care, entertainment, and education are closer to each other in the 27- to 29-year age group than in the 21- to 23-year age group. In this regard, late-twenties singles resemble late-twenties couples more than they resemble early-twenties singles.

Summary of total outlays

Data from the Interview Survey component of the CE for 2007–08 show that ages 21 to 29 years are a time of transition for young adults. Regardless of their marital status, persons in their late twenties, ages 27 to 29 years, earn more, spend more, are more likely to have a bachelor's degree, and are more likely to own a home than are their early-twenties counterparts. Singles in their early twenties earn less in income than early-twenties married couples, but spend about the same amount per capita. However, late-twenties singles earn per-capita incomes similar to those of late-twenties married couples, but spend significantly more per capita. Finally, late-twenties singles report larger per-capita outlays than married couples do in each category examined, except for health care. ■

Table 1. **Characteristics, per-capita outlays, and outlay shares of singles and married couples, by age group, 2007–08**

Category	21–29 years		21–23 years		24–26 years		27–29 years	
	Single	Married couple	Single	Married couple	Single	Married couple	Single	Married couple
Number of CUs (in thousands)	5,236	1,515	2,083	243	1,737	578	1,417	694
Per-capita income	$27,267	$34,046	$16,067	$22,986	$30,512	$33,723	$39,757	$38,182
Percent distribution:								
Sex								
Men	58	50	56	50	59	50	60	50
Women	42	50	44	50	41	50	40	50
Housing tenure								
Homeowner	16	55	6	17	14	55	35	69
Renter	84	45	94	83	86	45	65	31
Educational status (highest level attained by single or by any member of married couple)								
High school diploma or less	61	39	82	79	50	36	45	27
Bachelor's degree or higher	39	61	18	21	50	64	55	73
College enrollment (by single or by either member of married couple)								
Enrolled	43	39	67	46	34	47	18	29
Not enrolled	57	61	33	54	66	53	82	71
Total per-capita outlays:	$27,178	$25,646	$21,083	$20,120	$28,197	$26,761	$34,889	$26,649
Food	4,417	3,363	3,798	3,101	4,592	3,173	5,111	3,613
Food at home	2,359	1,940	2,050	1,932	2,417	1,830	2,744	2,036
Food away from home	2,057	1,423	1,748	1,169	2,175	1,343	2,367	1,577
Alcoholic beverages	660	227	637	195	683	265	668	205
Housing	9,964	8,844	7,266	6,045	10,238	9,249	13,593	9,484
Apparel	896	650	760	596	827	774	1,180	567
Transportation	4,233	5,128	2,991	4,286	4,461	5,393	5,779	5,202
Health care	570	963	334	913	663	1,061	802	899
Entertainment	1,346	1,347	1,048	1,299	1,415	1,246	1,702	1,448
Education	1,544	611	2,329	731	1,405	737	560	464
Personal insurance and pensions	2,431	3,250	1,200	1,932	2,782	3,279	3,811	3,686
Other outlays[1]	1,117	1,264	720	1,021	1,131	1,585	1,683	1,081
Total outlay shares (percent)								
Food	16.3	13.1	18.0	15.4	16.3	11.9	14.6	13.6
Food at home	8.7	7.6	9.7	9.6	8.6	6.8	7.9	7.6
Food away from home	7.6	5.5	8.3	5.8	7.7	5.0	6.8	5.9
Alcoholic beverages	2.4	0.9	3.0	1.0	2.4	1.0	1.9	0.8
Housing	36.7	34.5	34.5	30.0	36.3	34.6	39.0	35.6
Apparel	3.3	2.5	3.6	3.0	2.9	2.9	3.4	2.1
Transportation	15.6	20.0	14.2	21.3	15.8	20.2	16.6	19.5
Health care	2.1	3.8	1.6	4.5	2.4	4.0	2.3	3.4
Entertainment	5.0	5.3	5.0	6.5	5.0	4.7	4.9	5.4
Education	5.7	2.4	11.0	3.6	5.0	2.8	1.6	1.7
Personal insurance and pensions	8.9	12.7	5.7	9.6	9.9	12.3	10.9	13.8
Other outlays[1]	4.1	4.9	3.4	5.1	4.0	5.9	4.8	4.1

[1] Other outlays include personal care, reading, tobacco, cash contributions, and miscellaneous.
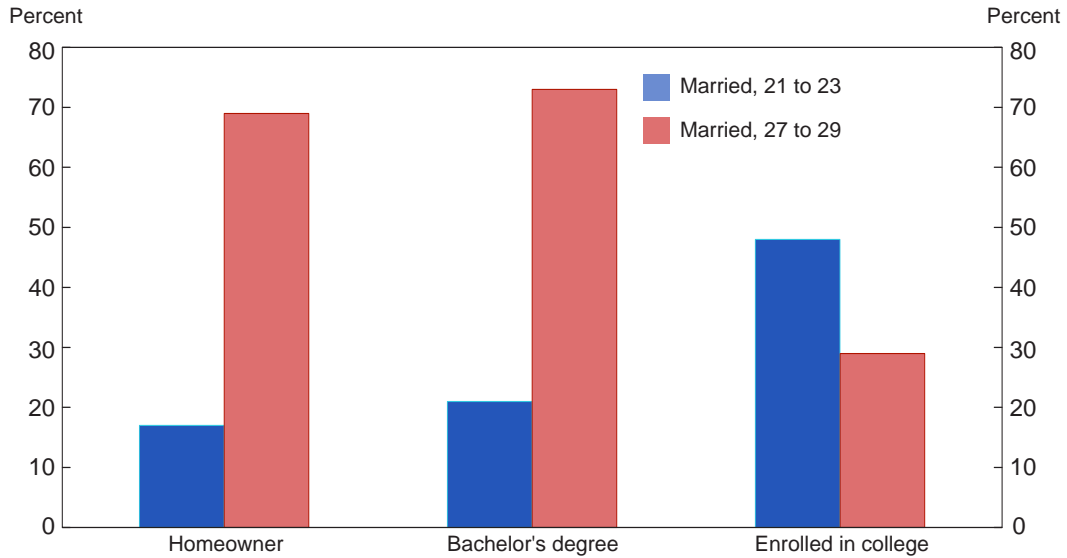
Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2007–08

Chart 1. **Comparison of home ownership, attainment of bachelor's degree, and college enrollment by singles in their early twenties and late twenties, 2007–08**

Percent

Percent
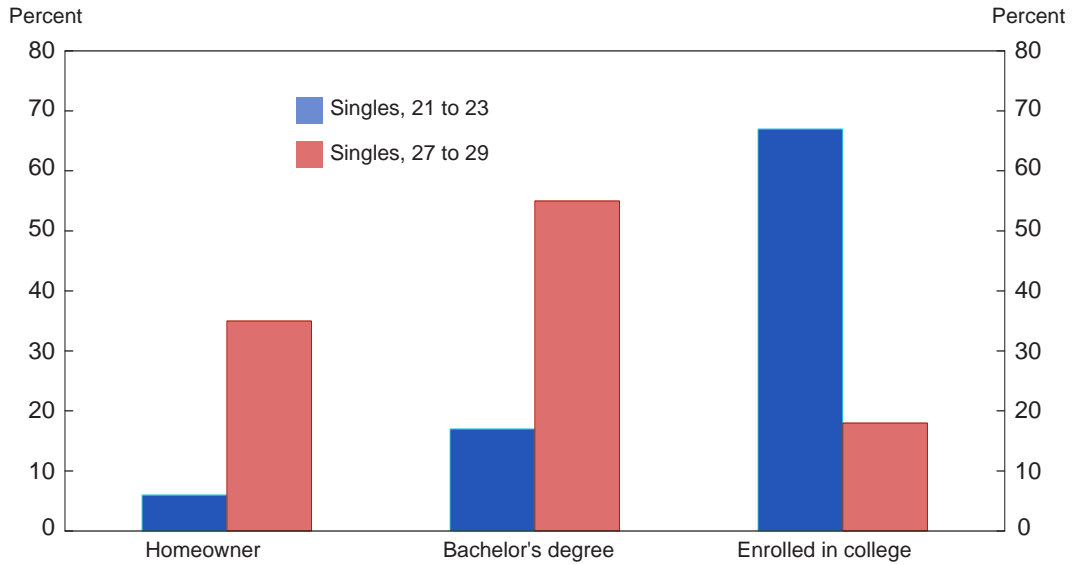
Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2007–08

Chart 2. **Comparison of home ownership, attainment of bachelor's degree, and college enrollment, by age of married reference person, 2007–08**

Percent

Percent

Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2007–08

Chart 3. Income of single persons and of married couples ages 21–29, 2007–08

Income
(dollars)

Income
(dollars)

- Married couples
- Single persons

	Early twenties	Midtwenties	Late twenties
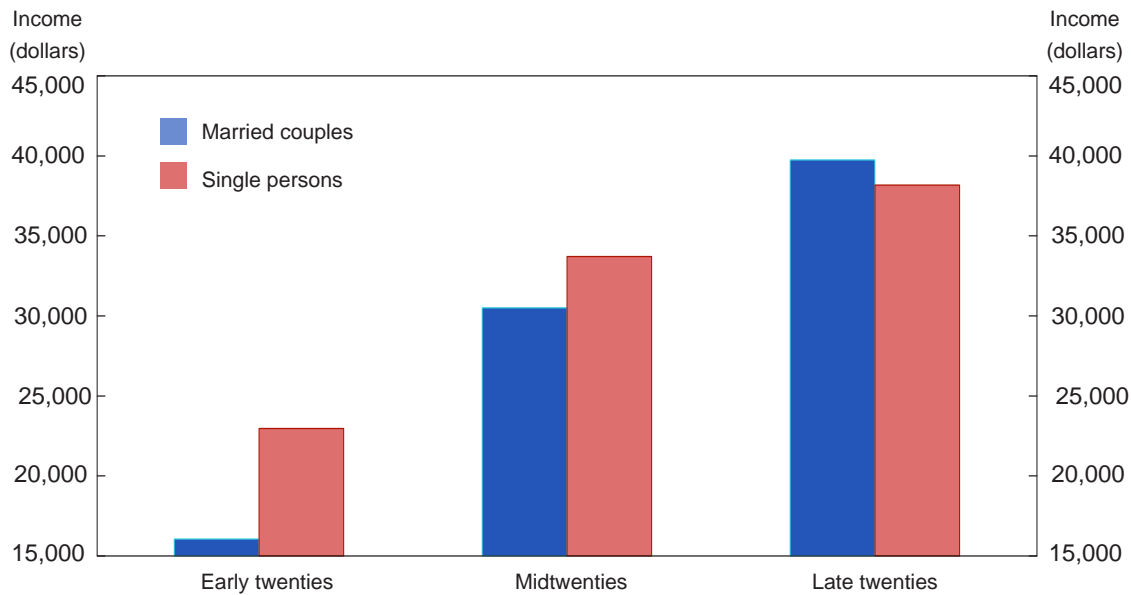
Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2007–08

Chart 4. Outlays of single persons and of married couples ages 21–29, 2007–08

Outlays

Outlays

- Married couples
- Single persons

	Early twenties	Midtwenties	Late twenties
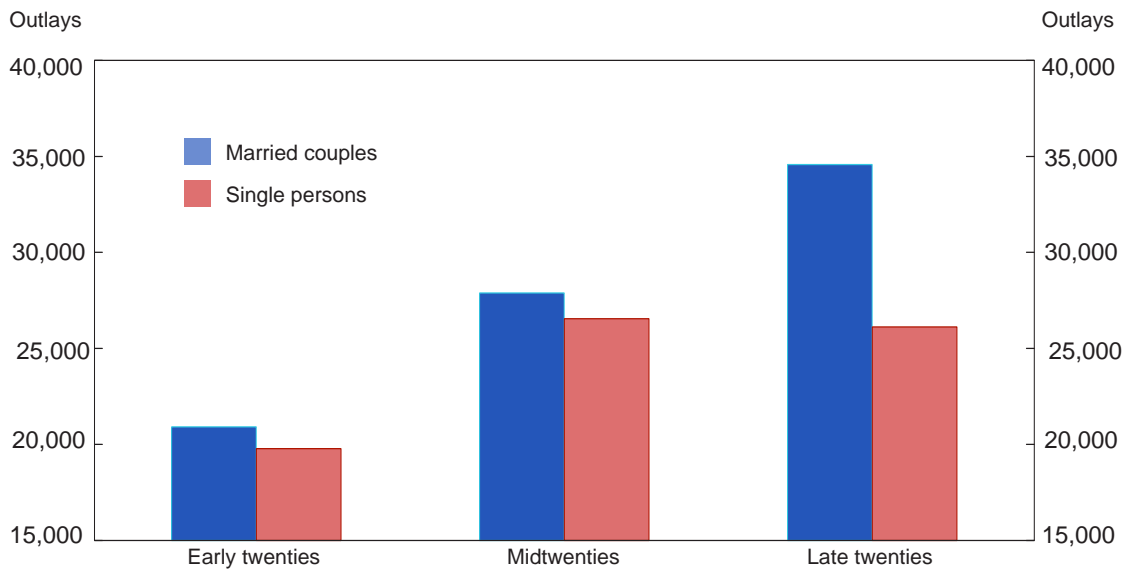
Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2007–08

Appendix A: Description of the Consumer Expenditure Survey

The current Consumer Expenditure Survey (CE) program began in 1980. Its principal objective is to collect information on the buying habits of American consumers. Consumer expenditure data are used in various types of research by government, business, labor, and academic analysts. Also, the data are required for periodic revision of the Consumer Price Index (CPI).

The survey, which is conducted by the U.S. Census Bureau for the Bureau of Labor Statistics, consists of two components: a diary or recordkeeping survey completed by participating consumer units for two consecutive 1-week periods, and an interview survey in which expenditures of consumer units are obtained in five interviews conducted at 3-month intervals.

Survey participants record dollar amounts for goods and services purchased during the reporting period, regardless of whether full payment is or is not made at the time of purchase. Expenditure amounts include all sales and excise taxes for all items purchased by the consumer unit for itself or for others. Excluded from both surveys are all business-related expenditures and expenditures for which the consumer unit is reimbursed.

Each component of the CE queries an independent sample of consumer units that is representative of the U.S. population. In the Diary Survey, about 7,000 consumer units are sampled each year. Each consumer unit keeps a diary for two 1-week periods, yielding approximately 14,000 diaries a year. In the Interview Survey, the sample is selected on a rotating panel basis, surveying about 7,000 consumer units each quarter. Each consumer unit is interviewed once per quarter for five consecutive quarters. Data are collected on an ongoing basis in 91 areas of the United States.

The Interview Survey is designed to capture expenditure data that respondents can reasonably recall for a period of 3 months or longer. In general, data captured include relatively large expenditures, such as spending on real property, automobiles, and major appliances, and expenditures that occur on a regular basis, such as spending on rent, utilities, and insurance premiums. Also included are expenditures incurred on leisure trips. Expenditures on nonprescription drugs, household supplies, and personal care items are excluded. The Interview Survey collects detailed data on an estimated 60 percent to 70 percent of total household expenditures. Global estimates—that is, expenditures made over a 3-month period—are obtained for food and other related items, accounting for an additional 20 percent to 25 percent of total expenditures.

The Diary Survey is designed to capture expenditures on small, fre-

quently purchased items that normally are difficult for respondents to recall. Detailed records of expenses are kept for food and beverages—both at home and in eating places—tobacco, housekeeping supplies, nonprescription drugs, and personal care products and services. Expenditures incurred away from home overnight or longer are excluded from the Diary Survey. Although the diary was designed to collect expenditure information that could not be recalled easily over any reasonably lengthy period, respondents are asked to report *all* expenses (except overnight travel expenses) that the consumer unit incurs during the survey week.

Integrated data from the BLS Diary and Interview Surveys provide a complete accounting of consumer expenditures and income that neither survey alone is designed to do. Data on some expenditure items are collected in only one of the surveys. For example, the Diary Survey does not collect data on expenditures for overnight travel or information on third-party reimbursements of consumer expenditures, whereas the Interview Survey does. Examples of expenditures for which reimbursements are excluded are medical care; automobile repair; and construction, repairs, alterations, and maintenance of property.

For items unique to one or the other survey, the choice of which survey to use as the source of data is obvious. However, there is considerable overlap in coverage between the surveys. Because of this overlap, integrating the data presents the problem of determining the appropriate survey component from which to select expenditure items. When data are available from both survey sources, the more reliable of the two (as determined by statistical methods) is selected. As a result, some items are selected from the Interview Survey and others from the Diary Survey. (See Creech and Steinberg's article, pages 17-20, for details on how the appropriate source is selected.)

The population coverage and the definition of home ownership differ between the CE and the CPI. As regards the former difference, consumer expenditure data cover the total population, whereas the CPI covers only the urban population. As regards the latter, actual expenditures of homeowners are reported in the CE, whereas the CPI uses a rental equivalence approach that attempts to measure the change in the cost of obtaining, in the rental marketplace, services equivalent to those provided by owner-occupied homes.

Interpreting the data

Expenditures are averages for consumer units with specified characteristics, regardless of whether a particular unit incurred an expense for a specific item during the recordkeeping period. The average expenditure for an item may be considerably lower than the expenditures by those consumer units which actually purchased the item. The less frequently an item is purchased, the greater is the difference between the average for all consumer units and the average for those purchasing the item. Also, an individual consumer unit may spend more or less than the average, depending on its particular characteristics. Factors such as income, the ages of family members, geographic location, taste, and personal preference influence expenditures. Furthermore, even within groups with similar characteristics, the distribution of expenditures varies substantially. These points should be considered in relating reported averages to individual circumstances.

In addition, sample surveys are subject to two types of errors: sampling error and nonsampling error. Sampling errors occur because the data are collected from a representative sample rather than from the entire population. Nonsampling errors result from the inability or unwillingness of respondents to provide correct information, differences in interviewers' abilities, mistakes in recording or coding, and other processing errors. ■

Glossary

Consumer unit. Members of a household related by blood, marriage, adoption, or some other legal arrangement; a single person living alone or sharing a household with others, but who is financially independent; or two or more persons living together who share responsibility for at least two out of three major types of expenses: food, housing, and other expenses. Also, students living in university-sponsored housing are included in the sample as separate consumer units.

Reference person. The first member mentioned by the respondent when asked to "Start with the name of the person or one of the persons who owns or rents the home." It is with respect to this person that the relationship of other members of the consumer unit is determined.

Total expenditures. The transaction costs, including excise and sales taxes, of goods and services purchased during the 3-month interval over which interviews take place. Estimates include expenditures for gifts and contributions and payments for pensions and personal insurance.

Income. The combined income earned by all consumer unit members 14 years or older during the 12 months preceding the interview. The components of income are wages and salaries; self-employment income; Social Security and private and government retirement income; interest, dividends, and rental and other property income; unemployment and workers' compensation and veterans' benefits; public assistance, Supplemental Security Income, and food stamps; rent or meals or both as pay; and regular contributions for support, such as alimony and child support. Missing income is imputed.

Quintiles of income before taxes. Consumer units are ranked in ascending order of income value and divided into five equal groups.