

Integration of Micro and Macro Data on Consumer Income and Expenditures

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Abstract

This paper examines macro and micro sources of information about household income and expenditures. The Bureau of Economic Analysis (BEA) produces macro estimates of personal income and outlays (PI&O) that are part of the U.S. National Income and Product Accounts (NIPAs). The Current Population Survey Annual Statistical and Economic Supplement (CPS-ASEC) from the Census Bureau and the Consumer Expenditure Survey (CE) program from the Bureau of Labor Statistics (BLS) are household surveys used to produce micro estimates of household income and expenditures. The CPS-ASEC collects detailed data on household income and on health insurance coverage. The CE, through the Interview Survey and the Diary Survey, collects data on direct household expenditures, as well as on household income and financial assets. BEA's estimates of personal income (PI), disposable personal income (DPI), personal outlays (PO), and personal consumption expenditures (PCE) cover the personal sector in the U.S. economy, consisting of resident households and of the nonprofit institutions serving households (NPISHs). The income and consumption estimates are integrated using BEA estimates of household income and outlays (HI&O), which exclude NPISHs. BEA estimates of HI&O are adjusted to match the civilian noninstitutional population covered in CE and CPS-ASEC. Data from CPS-ASEC and the CES are used to distribute the adjusted BEA values by household type, primary source of income, and income quintiles. The integrated estimates are developed for the years 2006 through and 2010. The results of the integration are discussed and the distribution of household income is compared to results from the CPS and Internal Revenue Service (IRS). The paper concludes with a discussion of the issues raised by the integration and the direction of future research.

Note: National Income and Product Accounts (NIPA) data cited in this report reflect published estimates prior to the revised estimates for 2009 and 2010 released in July 2012.

Kevin J. Furlong of BEA's NIWD Research Group made a major contribution to the development of the integrated estimates.

1. Introduction

Data on personal income and expenditures from the National Income and Product Accounts (NIPAs) produced by the Bureau of Economic Analysis (BEA) and from those based on household surveys have shown divergent trends in recent years. From 2000 to 2010, BEA estimates of real per capita disposable personal income (DPI) increased by 12 percent, while the Census Bureau's Current Population Survey Statistical and Economic Supplement (CPS-ASEC) estimates of real median household money income decreased by 7 percent. Consumer expenditure data have shown similar differences between the BEA estimates and those based on the Bureau of Labor Statistics' (BLS) Consumer Expenditure Survey (CE) program. These differences have been the source of much discussion and debate. The faster growth in the National accounts measures, which rely mainly on business surveys, tax information, and administrative data, have been attributed to a number of factors, including:

- Inclusion of in-kind supplements to wages and salaries in the NIPA estimates, which have grown faster than wage and salary income.
- Inclusion of in-kind government social benefits such as Medicare and Medicaid in the NIPA estimates, which have grown very rapidly in recent years.
- Better coverage of high income individuals, whose incomes have been growing faster than other groups, in National accounts than in household surveys.
- Overstatement by NIPA data of the condition of most households through the use of average rather than median or quintile data.

Though the NIPA estimates of household income and expenditures are generally considered to be more accurate than estimates derived from the household surveys and are broader measures, they have no distributional information. A proposed solution, and the approach followed in this paper, is to reconcile the differences in these estimates through the integration of micro data from household surveys with national accounts data.¹ This results in measures of income distribution and of other breakdowns of household income and consumption that are consistent with national accounts values and definitions. This is consistent with

¹ BEA and its predecessor agency, the Office of Business Economics, periodically published estimates of the size distribution of national accounts personal income in the U.S. from the 1950s to the 1970s using CPS, Internal Revenue Service, and Federal Reserve Board data, and such estimates were published as part of the National Income and Product Accounts from 1959 to 1964. More recently, the Expert Group on Disparities in National Accounts, sponsored by the Organization for Economic Cooperation and Development (OECD) and Eurostat, has been working to develop internationally comparable estimates of the breakdown of household income and consumption on a national accounts basis, and Fixler and Johnson have done work to account for the distribution of income in the U.S. National Accounts.

recommendations made in the “Report by the Commission on the Measurement of Economic Performance and Social Progress,” which stated that “distributional measures should be compatible in scope with average measures from the national accounts” (Stiglitz-Sen-Fitoussi, I.43).

The plan of this paper is as follows:

- Sources, methods, definitions, and classifications used for the macro- and micro-level estimates and how they relate to one another
- Scope alignment of the macro and micro estimates
- Micro-level income and expenditures and micro-level indicators used to distribute macro-level income and expenditure components
- Household breakdowns
- Results of the integration
- Comparison to other estimates
- Discussion of measurement issues.

2. Micro and Macro Income and Consumption Measures

Sources.—CPS-ASEC collects data on income, while the CE collects data on both income and expenditures. CPS-ASEC and the CE surveys are nationwide household surveys designed to represent the U.S. civilian noninstitutional population. There are differences between the survey in the unit of measure, and significant differences between in frequency and design.²

CPS-ASEC is an interview survey of a sample of about 75,000 households conducted in March of each year as a supplement to the monthly CPS, the primary source of labor market information for the U.S.³ The CPS sample consists of the March CPS sample plus additional households identified from other CPS sample months. The reference period for the income data collected by CPS-ASEC is the previous calendar year. March is chosen as the month to conduct the survey because it is during this time that people are filing or preparing to file their Federal income tax returns, and they should be able to more accurately report their income than that at

² The unit of measure in the CE is the consumer unit, and households in some instances have more than one consumer unit based on the criteria of financial independence. The differences are small, however (about 2 percent), and BLS uses the term households in its *Handbook of Methods* chapter about the CE, so households are used in this paper in describing the CE.

³ Since 2001, some CPS-ASEC interviews have been conducted in February and April.

any other time of the year. Prior to weighting, imputations are made for missing supplement items. The sample universe for CPS-ASEC is slightly broader than for the regular CPS in that it includes military living with at least one civilian adult.

The CE consists of an Interview Survey and of a Diary Survey. The Interview Survey is a quarterly rotating panel survey which collects data on income and on expenditures that are large, such as for property and motor vehicles, or that occur on a fairly regular basis, such as utility or insurance payments. Each household in the Interview Survey is interviewed 5 times. An initial “bounding” interview consisting primarily of information on demographic and family characteristics is followed by four quarterly interviews which collect data on expenditures and, for the second and fifth interviews, on income. In the fifth interview, data on changes in assets are also collected. Each quarter, 20 percent of the sample is replaced, as households completing their fifth interview are dropped and a new sample of those interviewed for the first time is added. Each quarter, expenditure data are collected from about 7,100 households, so that over a full year about 28,400 interviews are conducted. Households are asked to recall purchases in the past three months, either for the month of purchase or for the quarterly amount of expenditures, depending on the type of expenditure. Quarterly interviews of the panels in the sample occur during each month of the quarter, so that expenditures collected in the first month of the quarter refer to purchases made in the three months of the previous quarter, expenditures collected in the second month of the quarter refer to purchases made in the first month of the quarter and the last two months of the previous quarter, and so on. For income in the Interview Survey, the recall period is the past 12 months, which are allocated to months for the derivation of calendar-year estimates, since only those households having their second or fifth interview in January report for the previous calendar year. Values have been imputed for missing income variables since 2004.

The Diary Survey includes about 7,100 households per year. Each household completes two one-week diaries, so that there are about 14,200 diaries per year. The Diary Survey is designed to collect data on small, frequently purchased items which are difficult to recall. Diaries are spread evenly through all 52 weeks of the year.

Though there are items unique to the Interview Survey and to the Diary Survey, there is considerable overlap in the coverage of the two surveys. The published CE estimates combine data from the Interview and Diary surveys. When data are covered in both surveys, the more reliable of the two based on statistical criteria are used.

The sources used for the NIPA estimates of personal income and outlays are many and diverse, but can be characterized in general as being based on reports by businesses, which are collected administratively, from trade sources, in sample surveys such as the Census Bureau surveys of retail trade and service industries, and in economic censuses conducted at five-year intervals by the Census Bureau. Estimates of government social benefits included in personal income come from Federal agencies and from State and local governments as reported in annual Census Bureau surveys of government finances. Estimates of Social Security and Medicare taxes are based on data from the Social Security Administration, estimates of Federal income taxes are based on data from the Internal Revenue Service, and estimates of state and local taxes are based on annual Census Bureau surveys of government finance. Use of data from CPS-ASEC and CE is very limited: data on self-employment income from the CPS is used to develop adjustments for tax return nonfilers in the NIPA estimates of proprietors income, and in personal consumption expenditures (PCE), CE data for categories such as motor vehicle leasing are used, constituting less than one-half of one percent of the total PCE value.

NIPA estimates are generally considered more accurate than aggregate values derived from household surveys (CE 2006, 2010, 2011; CPS-ASEC 2000, 2004). Reports from businesses collected in economic censuses, sample surveys, and administratively are more reliable than household surveys, which for the CE Interview Survey and CPS-ASEC have issues with recalling income and expenditures and are subject to deliberate underreporting of certain items. For the CE Diary Survey, there are issues of what is sometimes called “diary fatigue”, which refers to the dropoff in recording of expenditures over time, evidenced by a persistent pattern of lower reported expenditures for the second of the one-week surveys compared to the first (CE 1983, 2003). Businesses are required to account for all of their receipts and expenditures on an ongoing basis. NIPA estimates are not considered “the truth” because the data on which they are based are subject to nonsampling error and, in many instances, to sampling error as well. However, NIPA expenditure estimates are periodically benchmarked to estimates based on the economic censuses, which are not subject to sampling error. For the overall economy, NIPA estimates of gross domestic product (GDP) are conceptually identical to gross domestic income (GDI), which measures the incomes generated and the costs incurred in generating GDP. The GDP and GDI measures are derived independently, and the difference between the two, known as the statistical discrepancy, is an indicator of the imperfections of the data used in generating the estimates. The observed range of the statistical discrepancy has been from minus two percent to plus two percent of GDP over time. If CE estimates of consumer expenditures were substituted for comparable NIPA estimates, the effect on the statistical

discrepancy would be about \$2 trillion in 2010, or about 13 percent of GDP. Significant differences also exist for a number of income components, in particular for property income.

Coverage—The civilian noninstitutional population is covered in both the CPS-ASEC and CE. Personal income and outlays (PI&O) estimates in the NIPAs cover the income and expenditures of those defined as U.S. residents in the national accounts, which includes nonprofit institutions serving households (NPISHs), the institutionalized population, federal civilian and military personnel stationed abroad, and persons whose usual place of residence is the U.S. who are private employees working abroad for a period of less than one year.⁴ Excluded from the NIPA definition of residents are foreign nationals who work and reside in the U.S. for part of the year and foreign nationals studying in the U.S. Also, NIPA estimates include the income and expenditures of those who died during the preceding year, who are not captured in CPS-ASEC, which is an annual survey collecting income data from households for the previous calendar year.⁵ Excluding NPISHs income and outlays from the PI&O and accounting for transfers between households and NPISHs gives a measure of household income and outlays (HI&O), which will be referenced during the remainder of the paper and used for the integration of the micro and macro estimates.⁶

Income Definitions.--Money income from CPS-ASEC was \$8.108 trillion in 2010, compared to NIPA household income of \$12.369 trillion.⁷ Growth from 2006 to 2010 was 10.0 percent for household income, versus 3.7 percent for money income, as shown in Table 1. Most of the difference in growth rates is attributable to definitional differences between household income and money income. Money income from CPS-ASEC is essentially a measure of cash income from the following sources:

- Wages and salaries
- Self-employment income
- Rental income from leasing of residential properties
- Royalties
- Interest and dividends
- Government transfers

⁴ The inclusion of NPISHs in PI&O is treated as a scope difference rather than as a definitional difference.

⁵ The situation is considerably more complicated for the CE. Households in the Interview Survey, who report for 5 consecutive quarters, may have a household member die during the course of the interviews, and for single-person households, this means that they would drop from the sample.

⁶ Separate estimates of household and NPISHs income and outlays are published annually in NIPA Table 2.9.

⁷ Household income is from NIPA Table 2.9, Line 22. NIPA estimates do not reflect revised estimates released July 27, 2012, which reduced personal income by \$51.6 billion, equal to 0.4 percent of the previously published value.

- Transfers from households and other private sources
- Pensions ⁸

Household income in the NIPAs includes, with the exception of transfers from households and pension income, these forms of cash income, but is a broader measure of income in that it includes the following imputations and third-party payments:

- Employer contributions to employee pension and insurance funds
- In-kind government social benefits
- Imputed interest received by depositors and insurance policyholders
- Interest and dividends received by entities holding household assets
- The imputed rental income of owner-occupied housing
- Current transfers from business
- In-kind income provided to employees
- Farm products consumed on farms
- Margins on owner-built housing

In addition, NIPA household income subtracts employee and self-employed contributions for social insurance, which is not done in the case of money income.⁹

The noncomparable household income components listed above increased by 28.5 percent from 2006 to 2010, much faster than overall household income, as shown in Table 1, and accounted for most of the difference in growth rates between household income and money income. Excluding these noncomparable items reduces household income growth from 10.0 percent to 5.9 percent, versus 3.7 percent for money income. After subtracting scope differences for comparable items and adding money income items not comparable to household income such as retirement income, growth is 6.3 percent. In dollar terms, household income increased \$1119.9 billion, while money income only increased \$286.0 billion. The rapid growth of noncomparable household expenditures accounted for 69 percent, or \$576.2 billion out of \$833.9 billion, of the difference in growth. The largest contributor was in-kind social benefits, which increased \$271.6 billion. Medicare and Medicaid expenditures accounted for the great majority

⁸ See CPS 2011, Appendix A, for listing of components of money income and CPS 1998, Appendix A for definitions of income components.

⁹ Employer contributions for social insurance (primarily Social Security and Medicare) are included in supplements to wages and salaries in compensation of employees, but are subtracted in deriving household income. See NIPA Table 2.1 and Table 3.6.

of this growth. The next largest contributors were the rental income of owner-occupied housing, which increased \$146.6 billion, and employer contributions for employee pension and insurance funds, which increased \$129.8 billion. In-kind government social benefits are those benefits provided for a specific purpose, for which households receive no discretionary cash income.¹⁰ These include health benefits under the Medicare, Medicaid, military dependent and retiree medical insurance, State Children's Health Insurance Program (SCHIP), general assistance medical programs of state and local governments, and medical benefits paid under Federal and state and local workers' compensation programs. Also included are food benefits under the Supplemental Nutrition Assistance Program (SNAP) (formerly known as Food Stamps) and the Women's, Infants', and Children's (WIC) program, and energy assistance. Some benefits, such as for education and employment and training, may be provided both in cash and in-kind. The value of separately-identifiable government in-kind benefits in 2010 was \$1,031.6 billion, the great majority of which is accounted for by Medicare and Medicaid benefits, which totaled \$923.8 billion. In-kind government social benefits increased 35.7 percent between 2006 and 2010.¹¹

Employer contributions to employee pension and insurance funds consist of contributions to employee retirement and insurance plans and to supplemental unemployment benefit plans. Payments to insurance plans include premiums for group health and life insurance and for privately administered workers' compensation plans.¹² Contributions equaled \$1,089.9 billion in 2010, consisting of \$470.3 billion in pension and profit-sharing contributions and \$619.7 billion in contributions to private insurance funds. Most private insurance contributions were accounted for by group health insurance, equaling \$560.9 billion. Growth in employer contributions was 13.5 percent between 2006 and 2010.¹³

Imputed interest received by depositors and insurance policyholders comes from banks, other depository institutions, regulated investment companies, life insurance carriers, and property-casualty insurance. The value of the imputed interest received by households was

¹⁰ In-kind government social benefits are not recognized separately from cash social benefits in the NIPAs. The in-kind benefits in this paper were identified through the application of the criteria stated above, from SNA 2008 §8.103.

¹¹ Though not included in money income, CPS-ASEC does collect information on participation in the Medicare and Medicaid programs and derives values for participants in these programs which are used in alternate income measures and for measuring the impact of government benefits (and taxes) on income and poverty measures.

¹² SPI Methodology, "III. Supplements to Wages and Salaries".

¹³ Though money income does not include employer health insurance contributions, CPS-ASEC does collect data on these contributions for use in alternative income measures. The CPS-ASEC value of these contributions was \$402.0 billion in 2010.

\$456.8 billion in 2010, an increase of \$53.9 billion, or 13.4 percent, from 2006. The imputed interest received from depository institutions and regulated investment companies equals the value of the services, such as recordkeeping and check clearing, provided without explicit charge; income is imputed to depositors and shareholders to pay for these services. Imputed interest received from life insurers consists of the property income earned on life insurance and annuity reserves. Imputed interest received from property-casualty insurers consists of property income earned on reserves held to pay claims, known as technical reserves. This income is deemed to be paid out to policyholders and then paid back to the insurers as premium supplements.

Interest and dividends received by entities holding household assets include private and government employee retirement funds, fiduciaries (retained income), and interest on unredeemed federal government savings bonds. The estimated value of the property income received by these entities was \$246.8 billion in 2010, and decreased by 0.7 percent, or \$1.8 billion, from 2006 to 2010.

The imputed rental income of owner-occupied housing was \$230.0 billion in 2010, and grew by 175.8 percent, or \$146.6 billion, between 2006 and 2010. Owner-occupied imputed rental income equals the gross rental value of owner-occupied housing, less intermediate expenses, property taxes less subsidies, net interest, and depreciation at current replacement cost.¹⁴ The largest factor in its rapid growth was a reduction in interest payments, reflecting declines in mortgage interest rates.

All other household income components not comparable to money income totaled \$55.6 billion in 2010, and grew by 35.3 percent, or \$14.5 billion, from 2006 to 2010. Current transfers from business include insurance payments to persons by business, losses by business due to fraud and unrecovered thefts, corporate cash prizes, and payments from personal injury trust funds. In-kind income provided to employees (other than health insurance contributions) consists of food, clothing, and lodging provided to civilian and military employees. The value of farm products consumed on farms equals the value of consumption less intermediate inputs.

Retirement income included in CPS-ASEC money income equaled \$387.9 billion in 2010, an increase of \$58.6 billion, or 17.8 percent, from 2006. This value includes pension income, survivors and disability benefits, and regular distributions from individual retirement

¹⁴ The depreciation measure is designated as “consumption of fixed capital” in the NIPAs. See NIPA Table 7.12, , lines 133 to 140.

accounts (IRAs), Keogh, and 401(k) plans. Pension income includes payments from companies, unions, Federal civilian and military retirement, state and local government retirement, railroad retirement, annuities or paid-up insurance policies, and other or unidentified retirement plans. Survivors and disability income includes income from the same sources, as well as benefits from workers' compensation and, in the case of disability benefits, from accident or disability insurance. Railroad retirement benefits and Black Lung benefits are not included in the noncomparable money income values because these benefits are treated as government social benefits in the household income estimates. Though not included in NIPA household income, however, benefits paid by employer-sponsored pension plans are estimated as an addenda item in a NIPA table covering employer contributions for employee pension and insurance funds, and equaled \$836.4 billion in 2010.¹⁵

Transfers from households and other private sources in CPS-ASEC include child support and alimony receipts and financial assistance from outside the household, and equaled \$48.7 billion in 2010. Transfers between resident households are considered intra-sectoral transfers and are not accounted for in the NIPAs. Transfers received from charities or other NPISHs would be included in household income in the NIPAs, though there does not appear to be any way in the CPS-ASEC data to identify financial assistance from NPISHs separately from assistance from other households. Transfers between resident and nonresident households are not included in NIPA household income; the value of payments received from the rest of the world is netted against payments to the rest of the world in household outlays. In the integrated estimates, child support and alimony received will be included in household income, and payments for child support and alimony, based on CES data, will be included in household outlays.

The value of household income components not comparable to money income equaled \$3110.8 billion in 2010. The net effect after the subtraction for employee and self-employed contributions for social insurance (primarily Social Security and Medicare) is \$2597.1 billion. Adjusting for scope differences of comparable items and adding the value of pension income and private transfers in money income not comparable to personal income of \$450.5 billion, the remaining difference between money income and personal income is \$1986.9 billion, which is attributable to measurement differences and to differences in the coverage and calculation of the remaining components, which consist of:

¹⁵ NIPA Table 6.11D, Line 38.

- Wages and salaries
- Proprietors' (self-employment) income
- Property income
 - Monetary interest (excluding pension funds and retained fiduciary income)
 - Dividends (excluding pension funds)
 - Rental income from leased dwellings
 - Royalties
- Cash government social benefits.

The remaining differences are largely accounted for by self-employment income and property income, with wages and salaries and government transfers making significantly smaller contributions to the differences, as shown in Table 2. The ratio of CPS-ASEC self-employment income to the NIPA value is 0.363 in 2010, with a dollar difference of \$654.7 billion. The property income ratio (including rents and royalties) is 0.308, with a dollar difference of \$742.1 billion. Wages and salaries are very close, with a 2010 ratio of .966 and a dollar difference of \$216.3 billion, and the government social transfers ratio is 0.691, with a dollar difference of \$355.0 billion.¹⁶

The low self-employment ratio is affected by significant adjustments made in the NIPAs. CPS-ASEC nonfarm self-employment income is expected to consistent with that reported on individual income tax returns, and for 2009, nonfarm self-employment income in CPS-ASEC was \$337.5 billion, compared to nonfarm proprietorship and partnership income of \$431.9 billion reported to the Internal Revenue Service (IRS), a ratio of 0.781.¹⁷ Nonfarm proprietors' income reported in the NIPAs was \$902.0 billion in 2009. The NIPA estimates use the IRS data as a starting point, but make substantial adjustments to align the estimates with NIPA definitions, to account for entities not captured in the IRS data, and to account for misreporting (7.14). The largest NIPA adjustments are \$444.1 billion for misreporting and a capital consumption adjustment of \$152.1 billion. The capital consumption adjustment changes depreciation from a tax-reported basis to a current replacement cost basis.

The low property income ratio is significantly affected by the inclusion in household income of dividends and interest not reported in CPS-ASEC. CPS-ASEC dividends and interest are believed to be consistent with interest (taxable and tax-exempt) and "ordinary dividends"

¹⁶ Appendix Table 1 has a detailed breakdown of the household income and money income differences.

¹⁷ 2010 IRS data are not yet available.

reported on U.S. individual income tax returns, IRS Form 1040. In 2009, CPS-ASEC interest and dividend income was \$266.6 billion, compared to \$405.1 billion reported on Form 1040, a ratio of .658. The difference may be considered an estimate of measurement differences. The remaining difference between the IRS value and the NIPA value of \$965.1 billion is due to the inclusion in the NIPA values of the following:

- Net interest accrued on unredeemed federal government savings bonds
- Interest and dividends received by individual retirement arrangements (IRAs) and other tax-deferred savings accounts
- Interest income of nonfinancial sole proprietorships and partnerships
- Income received by individuals from S corporations.¹⁸

S corporation income is not reported as dividends on individual income tax returns, but is treated as dividends in the NIPAs and equals passive and nonpassive gains less passive and nonpassive losses and certain expenses as reported on Schedule E of the federal individual income tax return (SPI Method). Since this income is not dividends for tax-reporting purposes, it is likely that they are not reported as such in CPS-ASEC, though they may be reported as part of self-employment income. Similarly, interest income received by nonfinancial sole proprietorships and partnerships is not included in interest reported on federal income tax returns, and may be reported as part of self-employment income in CPS-ASEC.

To derive disposable household income, household current taxes are subtracted from household income. These consist of federal and state income taxes, motor vehicle licenses, personal property taxes, and hunting, fishing, and other personal licenses. They do not include estate and gift taxes, which are classified in the NIPAs as capital transfers. Federal and state income taxes are collected in CPS-ASEC; though they are not a subtraction in deriving money income, they are subtractions in alternate income definitions used by CPS-ASEC in determining the effects of benefits and taxes on income and poverty.

Household outlays consist of household consumption expenditures, household interest payments, and household current transfer payments. Household consumption expenditures (HCE) adjusted for scope differences consist of direct household expenditures for goods and services, expenditures financed by government social benefits, imputed expenditures, and expenses of financial institutions holding household assets. Table 3 shows a reconciliation of PCE and CE consumer expenditures, accounting for scope, definitional, and measurement differences. Scope-adjusted HCE increased by 10 percent between 2006 and 2010, compared to

¹⁸ According to the IRS, S corporations are “corporations that elect to pass corporate income, losses, deductions and credit through to their shareholders for federal tax purposes.”

an increase of 1.3 percent for CE consumer expenditures. In dollar terms, the HCE increase was \$896.6 billion, versus \$74.6 billion for CE expenditures. About 64 percent of the difference, equal to \$461.7 billion, is accounted for by the net effect of definitional differences, with the remaining \$260.3 billion accounted for by measurement differences of comparable items. The largest contributor to the definitional differences was government health benefits, which increased by \$231.6 billion from 2006 to 2010. The next largest contributor was the net effect of definitional differences for owner-occupied housing. The gross rental value of owner-occupied housing in HCE increased \$90.3 billion, while owner-occupied housing expenses in CE decreased by \$14.2 billion, for a net effect of \$104.5 billion. The HCE increase was 8.0 percent, while the CE decrease was more than accounted for by a decrease in interest payments.¹⁹

Most direct household expenditures are comparable to CE consumer expenditures. A significant exception is financial services. Securities commissions, portfolio management and investment advice services, penalty fees on bank and credit card accounts, and trust, fiduciary, and custody activity fees are not captured in CE consumer expenditures.²⁰ Government social benefits include health benefits and energy assistance, which have their counterparts in household income. Government education benefits are not captured in CE consumer expenditures, though Supplemental Nutrition Assistance Program benefits (formerly known as Food Stamps), which are noncomparable items in household income, are included in CE food expenditures. Imputed expenditures which have no counterparts in CE consumer expenditures include the following:

- Employer contributions for group health insurance and workers' compensation
- Gross rental value of owner-occupied housing²¹
- Financial services furnished without payment to depositors and borrowers
- Premium supplements for property and casualty insurance
- Farm products produced and consumed on farms.²²

Financial services furnished without payment to depositors have their counterparts in household imputed interest received by commercial bank, savings institution, and credit union depositors and by shareholders in regulated investment companies. Borrower services are those

¹⁹ The CE does collect data on the self-reported rental value of owner-occupied housing which is used in the integrated estimates. This rental value showed very little change between 2006 and 2010.

²⁰ Late fees paid on credit cards and other credit sources are reported on the CE Interview Survey, but are not reported separately from finance charges and interest.

²¹ In NIPA 7.12, the imputed rental value is net of the intermediate expenses and investment in owner-occupied residential structures and the imputation also nets out investment in owner-occupied residential structures. [...](#)

²² In NIPA Table 7.12, food produced and consumed on farms is net of intermediate inputs.

provided on non-mortgage loans from commercial banks, and are that part of nominal interest paid by borrowers that are payments for services; household interest payments in household outlays are net of the value of these services. Employer contributions for health insurance, which have their counterpart in household income, are captured in two parts of HCE: benefit payments are included in health expenditures, and premiums net of benefits are included in health insurance. The net cost of private workers' compensation is included in HCE for health insurance, while medical benefit payments are included in HCE for health; cash payments for private workers' compensation are included in CPS-ASEC money income. Premium supplements for property and casualty insurance have their counterpart in imputed interest received by property-casualty insurance policyholders in household income. Farm products produced and consumed on farms measures the gross value of farm own-consumption; the value net of intermediate inputs is included in household income. The values of food and lodging furnished to employees, which are imputed values in HCE, have their counterparts in imputed wages and salaries in household income, and these are captured in the CE as "food as pay" and "rent as pay."

Household interest payments in NIPA household outlays are non-mortgage interest payments. The CE Interview Survey captures these payments in consumer expenditures, though in the CE these also include late fees and other penalty fees, which are part of HCE. Household current transfer payments consist of payments to government, contributions to nonprofit institutions, and net transfers to the rest of the world. Payments to government consist of contributions, fees, and fines paid to Federal, state, and local governments. Contributions are captured in CE consumer expenditures, though these are not broken down by nonprofit institutions and government. Net transfers to the rest of the world consist of U.S. households' transfers to foreign residents less foreign transfers to U.S. resident households. These are probably included in "other cash gifts" in consumer expenditures, though there is no differentiation between gifts sent to resident households and those sent to nonresident households.

3. Adjusting the Scope of the Macro Estimates

The first step in the integration of macro and micro income and consumption estimates is to adjust the scope of the NIPA estimates in order to align them with the civilian noninstitutional population covered in CPS-ASEC and the CES. In most cases this means removing certain population groups from the estimates, though in a couple of instances it means adding population groups. Table 4 shows scope adjustments to household income and outlays for 2010. The

overall adjustment to household income was \$443.0 billion, equal to 3.6 percent of NIPA household income, with the majority of the adjustment accounted for by Medicare and Medicaid expenditures. The following population groups are removed from the macro estimates:

- Institutionalized
- Decedents
- U.S. residents not physically present in the U.S.
 - U.S. government civilian and military personnel stationed abroad
 - Private employees whose usual place of residence is the U.S. who are on foreign assignment for a period of less than one year
- Domestic military living on post

The following groups are added to the macro estimates:

- Foreign nationals studying in the U.S.
- Foreign temporary agricultural and nonagricultural workers living in the U.S.
- Foreign professionals temporarily residing in the U.S.

Institutionalized.—The institutionalized population consists of those living in institutionalized group quarters, including correctional institutions, nursing homes, mental hospitals, hospitals or wards for the chronically ill and for those who have no usual home elsewhere, and institutions for the mentally retarded, physically handicapped, and drug/alcohol abusers. Cash income of the institutionalized population is estimated using income of the institutionalized and total U.S. income from the 2000 Census of Population and Housing 5 % Microdata Sample. Income shares for the following categories were calculated from the Census data:

- Wages and salaries
- Self-employment
- Interest, dividends, rental income, royalty income, income from estates & trusts
- Social Security and Railroad Retirement
- Supplemental Security Income
- Public assistance
- Other income, including veterans benefits, unemployment compensation, child support, and alimony.²³

²³ Retirement income for the institutionalized and for the total population are also available from the 2000 Census, but are not used in the scope adjustments because household income does not include retirement income.

The income shares from the 2000 Census were applied to the appropriate household income categories. Wages and salaries shares were applied to the components of compensation of employees, including employer contributions for employee pension and insurance funds and for government social insurance (the latter not included in household income). Self-employment income shares were applied to farm and nonfarm proprietors' income. Interest, dividends, and related income shares were applied to household interest income and dividend income. Social Security, Railroad Retirement, and Supplemental Security Income shares were applied to the respective government social benefits categories. Public assistance shares were applied to the family assistance and general assistance categories of government social benefits. Other income shares were applied to workers' compensation, unemployment compensation, other government social benefits except Medicare and Medicaid, and current transfer receipts from business and from nonprofit institutions. Income shares ranged from less than 1 percent for wages and salaries and self-employment income to 9.4 percent for public assistance. Adjustments for institutionalized cash income were \$85.3 billion in 2010, 0.7 percent of household income. Medicare and Medicaid benefits for nursing home residents, which are not included in the 2000 Census income, totaled \$78.1 billion in 2010, 0.6 percent of household income, so that the total institutional adjustment to household income was \$163.4 billion, 1.3 percent of household income. Personal current taxes, disposable household income, and household outlays were also reduced by 1.3 percent.

Decedents.—The decedent adjustment removes the income and outlays of those who died during the reference year. Cash income of decedents was estimated using mortality rates by age, sex, and race, applied using Monte Carlo simulations to CPS databases for 2006 to 2009 matched on sex and race combinations to estimate decedents and their income. The weighted sum of the income variables was divided by 2 to represent decedent income for the year. Adjustments for decedent cash income were \$53.1 billion in 2010, 0.4 percent of household income.

Estimates of in-kind social benefits received by decedents from the Medicare and Medicaid programs are based on the results of a studies which have estimated the share of Medicare and Medicaid expenditures for persons in the last year of life (MED 2002, 2010). The first study, based on data from the 1992-1996 Medicare Beneficiary Study, showed 25 percent of Medicare Expenditures and 26 percent of Medicaid expenditures were for those in the last year of life. The more recent student also shows that expenditures for those in the last year of life account for 25 percent of all Medicare spending. Percentages were adjusted to 24 percent for Medicare and 18 percent to account for nursing home care captured in the institutionalized adjustment. These benefits totaled \$195.5 billion in 2010, 1.6 percent of household income, so that the total decedent adjustment was \$248.6 billion, 2.0 percent of household income.

Personal current taxes, disposable household income, and household outlays were also reduced 2 percent.

U.S. residents not physically present in the U.S.--The following income items of U.S. government civilian and military personnel stationed abroad are removed:

- Wage and salary disbursements
- Supplements to wages and salaries
- Dividends, interest, and rent on federal retirement plans
- Less: Contributions for government social insurance.

These adjustments are the same as those made in BEA's state personal income estimates, and are calculated as the difference between NIPA estimates for those income components and the state personal income components (SPI October 2011).²⁴ Earnings of private U.S. residents employed abroad for a period of less than one year, from unpublished data in BEA's International Transactions Accounts, are also excluded. The 2010 adjustments for federal workers were \$27.1 billion in 2010, and for private workers \$1.1 billion. Personal taxes are estimated as the difference between state personal current taxes and NIPA personal current taxes. Expenditures by federal government employees and by private employees abroad are estimated in the U.S. International Transactions Accounts and included as separate estimates in HCE.

Domestic military on post.—The income of military personnel living on post consists of wages and salaries, employer contributions for government social insurance, employer contributions for military retirement, employer contributions for group life insurance, and interest income on military retirement. The wages and salaries of domestic military personnel living on post are estimated as the product of the number of personnel and an average rate of pay. Estimates of the number of military personnel living on post are based on counts of these personnel from the 2000 and 2010 Decennial Censuses of Population and Housing, calculated as a percentage of total active duty military personnel, with the percentage interpolated between 2000 and 2010 and applied to the total number of military personnel in each year. Data on total active duty military personnel are from the Department of Defense's Personnel and Military Casualty Statistics. Average pay was estimated using pay scale data from the Department of Defense's Defense Finance and Accounting Service. Average wages and salaries equaled basic monthly pay and basic allowance for subsistence for military pay grade E-4, the pay grade for enlisted personnel believed to reflect the average pay grade of personnel living on post. Employer contributions for

²⁴ The values used in this paper are slightly different from those published in October 2011, based on more up-to-date data.

social insurance were estimated using the Social Security/Medicare tax rate. Employer contributions for military retirement were estimated using military retirement contributions as a percentage of total military wages and salaries and applying this percentage to estimated wages and salaries for military living on post. Contributions for government social insurance, a subtraction in deriving household income, were calculated as twice the employer contributions for government social insurance. Personal current taxes, a subtraction in deriving disposable household income, were estimated by applying the overall tax rate on household income to basic pay. Personal outlays were assumed to be the same proportion of disposable income as the overall rate.

Foreign students, temporary workers, and professionals in the U.S.—Estimates of compensation for foreign workers studying at colleges and universities in the U.S., foreign professionals temporarily residing in the U.S., and foreign temporary agricultural and nonagricultural workers in the U.S. are from unpublished detail from the U.S. International Transactions accounts. Income of these groups was \$12.7 billion in 2010. Expenditures by these groups in the U.S. are estimated in the U.S. International Transactions Accounts.

Medicare and Medicaid payments for the institutionalized and decedents accounted for \$273.6 billion in 2010, equal to 62 percent of the total adjustment of \$443.0. Disposable household income was reduced by 3.6 percent, the same percentage as overall household income, and household outlays were reduced by 3.3 percent. The slightly smaller reduction in household outlays reflects the fact that Medicare and Medicaid expenditures were reduced by the same amount as income.

4. Matches and Indicators

The integration of scope-adjusted macro income and expenditure estimates with micro estimates required the identification of micro series that matched the macro series as defined in the NIPAs as closely as possible. For NIPA series which could not be matched to micro variables, indicators were developed to distribute the macro values. For income, most cash income included in household income was matched to CPS-ASEC series. Series were treated as matches if they referred to the same type of income, even if there were significant differences in coverage and measurement. Appendix Table 1 and Appendix Table 2 provide detailed information on the matches and indicators, indicating an exact match (XM) if the income items were defined identically, a partial match (PM) if there were differences in definition such as in the types of income included, and the use of an indicator (I) where no match existed. An

example of an indicator is the use of participants in a government program to distribute the government social benefits for that program. “Coverage ratios” were calculated as the micro values divided by the macro values.

Disposable Household Income

Compensation of employees.--Wages and salaries matched definitionally and had very high coverage ratios: 2010 CPS wages and salaries were 97 percent of the NIPA value. For supplements to wages and salaries, data on payroll taxes and on employer contributions for health insurance collected in CPS-ASEC for use in alternative measures of income were matched to the two largest components. The health insurance contributions are a direct match, while the payroll taxes paid by employees for Social Security and Medicare (FICA) , were assumed to be the same as employer payments and matched to employer contributions for old age, survivors, and disability insurance.²⁵ For military medical insurance, which provides coverage to dependents of active duty military personnel at nonmilitary facilities, the number of family households with one or more members in the armed forces and participating in military health care was used as the indicator. For supplemental unemployment benefits, CPS-ASEC benefits received were used as the indicator. Wages and salaries were used as indicators for the remaining components. For employer contributions to pension plans, wages and salaries of those participating in employer-sponsored pension plans were used . Private wages and salaries were used as the indicator for employer contributions to private workers’ compensation, and total wages and salaries were used as indicators for group life insurance and for government social insurance contributions other than Social Security and Medicare and military medical insurance. These social insurance contributions consist primarily of unemployment insurance and state workers’ compensation.

Proprietors’ income.—Farm and nonfarm proprietors’ income were matched to their respective self-employment counterparts in CPS-ASEC. As previously discussed, the measures of income from self-employment differed definitionally and had low coverage ratios: CPS nonfarm self-employment income was 35 percent of the NIPA value for 2009 (2.1).

Rental income of households.—This is measured in the NIPAs as rental income on tenant-occupied dwellings, royalties, and the imputed rental income of owner-occupied housing. The

²⁵ The employer and employee tax rates were the same through 2010, the latest year covered in this study.

CPS-ASEC series for rents, royalties, estates or trusts is matched to the sum of tenant-occupied dwellings income and royalties. The match is clearly not exact because of the inclusion of estate and trust income in the CPS-ASEC series, whose value was 66 percent of the scope-adjusted NIPA value of \$111.1 billion in 2010. The NIPA value for the imputed rental income of owner-occupied housing, which has no CPS-ASEC counterpart, was derived by subtracting expenses from the gross rental value of housing, including intermediate expenses, property taxes, net interest, and consumption of fixed capital. A match was constructed using data from the CE Interview Survey, including the rental equivalence of owned homes and expenses for insurance, maintenance and repairs, closing costs, mortgage interest, and property taxes. Homeowners' insurance premiums were used as indicators for insurance net of losses and for net insurance settlements, each a part of intermediate expenses in the NIPA estimates.²⁶ Maintenance and repair expenditures and closing costs, also included in intermediate expenses, were matched exactly, as were property taxes. Mortgage interest reported in the CE was used as an indicator for net interest and for borrower services included in intermediate expenses. Net interest and borrower services sum to mortgage interest paid; in the NIPAs, part of the nominal mortgage interest paid is deemed to be payments for services provided to borrowers. Consumption of fixed capital, with no CE match, used owners' equivalent rent as an indicator.

Income receipts on assets.—Household interest and dividend income were broken out into monetary interest received by publicly administered government employee retirement plans, monetary interest received by private noninsured pension plans, other monetary interest, imputed interest by type of financial institution, and dividend income. Because household monetary interest and dividend income in the NIPAs are estimated as residuals, and because only interest received by publicly administered government employees retirement plans is reported separately, separately identifying interest and dividends received by entities holding household assets from income received directly by households is difficult. For monetary interest, only interest received by employer-sponsored pension plans (for government and private employees) was estimated separately. For 2009, monetary interest was \$623.5 billion, of which pension plan interest was \$161.9 billion; the remaining \$461.6 billion in interest includes that received directly by households and by nonfinancial sole proprietorships and partnerships, fiduciaries, IRAs and other tax-deferred savings accounts. The remaining interest income is matched to CPS-ASEC interest, and all of NIPA dividends are matched to CPS-ASEC dividends. For publicly administered government employee pension plans and for private pension plans, wages and salaries of government workers and of private workers participating in pension plans were used as indicators.

²⁶ Net insurance settlements measures the difference between actual and expected losses.

Imputed interest is received from banks and other depository institutions, from regulated investment companies (RICs), from life insurance carriers, and from property-casualty insurance companies. Indicators were used in all instances. For depository institutions, interest was distributed using the value of savings and checking accounts held by consumer units from the CE. For RICs, interest received by private pension plans uses the wages and salaries of private employee pension plan participants from CPS-ASEC, while for other interest received from RICs, the market value of all securities held from the CE is used. For imputed interest received from life insurance carriers, premiums for life, endowment, annuities, and other insurance policies providing death benefits from the CE Interview Survey were used. For property-casualty insurance companies, premiums for vehicle insurance and homeowners' insurance from the CE Interview Survey were used as the indicator.

Government social benefits.—Scope-adjusted government social benefits in the NIPAs were \$1904.3 billion in 2010. Of this amount, 56 percent or \$1066.7 billion were cash benefits, 39 percent (\$749.4 billion) were in-kind benefits, and 5 percent (\$88.2 billion) were a combination of cash and in-kind benefits. Almost all of the cash benefits were matched to CPS-ASEC variables, including Social Security, railroad retirement, unemployment insurance, Supplemental Security Income, refundable tax credits, temporary disability insurance, family and general assistance, and veterans' pensions and disability. For in-kind benefits, the largest of these are Medicare and Medicaid, which were matched to the "person market value" of each of these programs in CPS-ASEC, which measures the average government cost per recipient and is akin to the insurance cost of coverage. The CPS-ASEC value of the Supplemental Nutrition Assistance Program (SNAP)—formerly known as food stamps—is matched to the NIPA value. For other in-kind social benefits, including energy assistance, other state and local medical care, Women's Infants and Children's (WIC) food benefits, and dependent and retiree military medical insurance, benefits were distributed using the numbers of participants by household. Government social benefits which are a combination of cash and in-kind benefits, including veterans' education and training benefits, workers' compensation, and educational assistance, were matched to the cash benefits in CPS-ASEC.

Other current transfer receipts.—These include receipts from business and from NPISHs, and alimony and child support payments from other households. Receipts from business, which include payments by insurance to persons and business losses due to fraud and theft, have no counterpart in CPS-ASEC. Insurance reimbursements from the CE for stolen or total loss vehicles were used as an indicator, though the link is weak, in that payments from commercial motor vehicle policies are only a portion of the transfer receipts from business, and reimbursements reported in the CES are probably overwhelmingly from private passenger

policies rather than from commercial policies. Current transfer receipts from business were \$24.2 billion in 2010, 0.2 percent of total household income. For current transfer receipts from NPISHs, the matched CPS-ASEC series was private educational assistance, though this is only a partial match, since transfers from educational institutions account for only part of receipts from NPISHs. Receipts from NPISHs were \$78.9 billion in 2010, 0.7 percent of total household income. For alimony and child support, the CPS-ASEC values were used directly, and equaled \$31.4 billion in 2010, 0.3 percent of household income.

Less: Contributions for government social insurance, domestic.—The employer contributions are the same as for compensation of employees. Payroll taxes from CPS-ASEC, used for the employer contributions match, are nearly an exact match for the NIPA employee contributions, with FICA contributions accounting for 98 percent of the \$408.9 billion in 2010. The indicator used for self-employed contributions is CPS-ASEC farm and nonfarm income self-employment income. For contributions for Medicare supplementary medical insurance, CE values for Medicare payments and for Medicare Prescription Drug premiums were matched to the NIPA values.

Less: Household current taxes.—For federal income taxes and for state and local income taxes, CPS-ASEC taxes before credits were matched to the NIPA values. For motor vehicle licenses, CE values for state and local registration and for drivers licenses were matched to the NIPA values. For other taxes, including hunting, fishing, and other personal licenses, CE fees for participant sports were used as the indicator, though the link is weak, in that sporting licenses are a relatively small part of the overall fees for participant sports.

Household Consumption Expenditures

For the great majority of direct household expenditures, near or exact matches from the CE data were made. For a number of HCE categories, in order to align expenditures with the CE values, adjustments had to be made to account for expenditures by residents while out of the country and to exclude expenditures by nonresidents traveling in the U.S. This was done primarily using data from the U.S. Travel and Tourism Satellite Accounts.

Imputed rental value of owner-occupied housing.—The CES rental equivalence of owned dwellings is an exact match.

Health care.--For health benefits paid by employer-paid health insurance, CPS-ASEC values for employer contributions for health insurance were used as indicators. For health benefits paid by employee and self-paid insurance, the CE values for health insurance premiums paid were used

as indicators. For Medicare, Medicaid, and other state and local medical care, the CPS-ASEC values were used as indicators. Out-of-pocket and other expenditures were matched to CE values.

Motor vehicles and recreational vehicles.--Sales were netted from CE values and trade-in values were added to net expenditures to align them with NIPA values.

Motor vehicle maintenance and repair.--NIPA values were disaggregated into motor vehicle body repair and other motor vehicle maintenance and repair. CE motor vehicle insurance premiums were used as the indicator for motor vehicle body repair, while CE expenditures for motor vehicle maintenance and repair were matched to other motor vehicle maintenance and repair.

Post-secondary education--This includes higher education and commercial and vocational schools. The CPS-ASEC values used for government social benefits were matched to the portion of the NIPA expenditures financed by government. CE values for tuition expenditures were matched to the remaining NIPA expenditures.

Financial services.—This category has no CE matches, so indicators from CPS-ASEC or CE were used in all instances. For financial services furnished without payment by depository institutions and by regulated investment companies, the indicators are the values of deposits and of securities holdings, the same indicators used for imputed interest income in household income. For pension fund expenses, wages and salaries of those participating in employer-sponsored pension plans was used, the same indicator as that used for employer contributions to pension plans in household income. For financial service charges and fees, an indicator consisting of safe deposit box rental, checking account fees, credit card membership fees, and finance charges excluding mortgages and vehicles—which includes late charges—from the CE was used. For securities commissions, an indicator consisting of the sum of the purchase price of securities including brokerage fees and the sale price of securities net of brokerage fees from the CES was used as an indicator. For portfolio management, investment advice, trust, fiduciary, and custody activities, the market value of all securities held was used as an indicator.

Insurance.—For life insurance, which is measured by the expenses of insurers and the profits of stock life insurance companies in the NIPAs, premiums for life, endowment, annuities, and other insurance policies providing death benefits from the CE were used as an indicator. Household insurance, which is insurance on household contents and is net of losses, was disaggregated into two parts: net tenants' insurance and net homeowners' insurance on household contents. Premiums for tenants' insurance from the CE were used as the indicator for the former, and

premiums for homeowners insurance were used for the latter; coverage for household contents is generally a portion of homeowners insurance. Medical care and hospitalization insurance, which is measured as premiums net of benefits, was disaggregated into five parts: employer-paid insurance, employee and self-paid insurance, Medicare, Medicaid, and other state and local medical care. Employer-paid premiums from CPS-ASEC was used as the indicator for employer-paid insurance, and CE health insurance premiums (excluding Medicare supplement premiums) were used as the indicator for employee and self-paid insurance. The person market values of Medicare and of Medicaid from CPS-ASEC were used as indicators for the respective parts of medical and hospitalization insurance, and the indicator for other state and local medical insurance was the number of children by household enrolled in the SCHIP program from CPS-ASEC. For income loss insurance and for private workers' compensation, wages and private wages, respectively, from CPS-ASEC were used as indicators. For motor vehicle insurance, premiums for auto insurance and auto repair service policies were used as an indicator.

Social services and religious activities.—For child care, CE other expenses for day care centers and nursery schools, including tuition, and expenditures for babysitting and child care were used as an indicator. This is considered an indicator because nursery school expenditures are classified with education expenditures. Social assistance was broken down into Medicare, Medicaid, other state and local medical care, and out-of-pocket and other expenditures. The person market values for Medicare and Medicaid from CPS-ASEC were used as indicators for the respective components, and the number of children by household enrolled in the SCHIP program from CPS-ASEC used as the indicator of other state and local medical care. The remaining social assistance expenditures and expenditures for social advocacy and civic and social organizations, religious organizations, and foundations and grantmaking and giving services were distributed evenly to all households because of the lack of indicators. These expenditures equaled \$68.1 billion in 2010, 0.7 percent of household consumption expenditures.

Professional and other sources.—Wages and salaries from CPS-ASEC were used as an indicator for two series: employment agency services and professional association dues. Expenditures for these categories were less than 0.1 percent of HCE in 2010. Labor organization dues were distributed using labor union members by households.

Other household outlays

Non-mortgage interest payments from the CE are the indicators for both monetary interest paid and imputed interest paid, which is a negative value which removes borrower services from monetary interest. For transfers to government, which consists largely of gifts such as those to higher education institutions, the CE indicator is cash contributions to

educational institutions. This is a somewhat weak indicator, in that the CE value includes gifts to private educational institutions, and household current transfers includes other items, such as fines. The CE indicator for household transfer payments to the rest of the world is the CE series other cash gifts. The indicator for transfers to NPISHs is the combination of CE cash contributions to religious organizations, charities, educational institutions, and political organizations. CE alimony and child support expenditures are used directly.

5. Household Breakdowns

The CPS and CE data are used to break down the scope-adjusted household income and outlays values along three dimensions:

- Household type
- Main source of income
- Quintiles of disposable income

Households are divided into the following types:

- Single up to 65
- Single greater than 65
- Single with children under 18
- Two adults up to 65
- Two adults with at least one greater than 65
- Two adults with children under 18
- Other household types

The “other” household type includes children 18 or older living with parents.

The main sources of income distinguished are:

- Employee compensation
- Self-employment income
- Property income
- Transfers and other income

Property income includes rental income, interest, and dividends. Transfers and other income include government social benefits and transfers from NPISHs, businesses, and other households.

Household disposable income is broken down into quintiles equivalized to account for differences in household size and composition. It uses the Oxford (sometimes called the OECD) modified scale, in which a weight of 1.0 is given for the household head, a weight of 0.5 for each additional adult household member, and a weight of 0.3 for each child. The weighting reflects how households share resources and take advantage of economies of scale. It has similarities to the three-parameter scale used to produce equivalence-adjusted income in CPS-ASEC. For quintiles, income shares by primary source of income are broken down as follows:

- Earned income
- Property income
- Government social benefits and other transfers

Earned income combines employee compensation and self-employment income and nets out employer, employee, and self-employed contributions for government social insurance. Government social benefits and other transfers equal transfers and other income less contributions for Medicare supplementary medical insurance.

6. Results

Income Quintiles

The share of disposable household income accounted for by the lowest quintile increased from 4.9 percent in 2006 to 5.4 percent in 2010, while the share accounted for by the highest quintile decreased from 48.4 percent to 47.1 percent; the shares accounted for by the other quintiles showed little change (Table 5). For all income groups during this period, there was a significant increase in the share of income accounted for by government social benefits and other transfers, and corresponding decreases in the shares accounted for by earned income and property income. The shift in sources of income was especially pronounced for the three lowest quintiles. In particular, the share of income accounted for by earned income for the lowest quintile fell by 7.7 percentage points from 2006 to 2010, and the share accounted for by government social benefits and other transfers increased by 8.4 percentage points.

For 2010, the share of disposable household income accounted for by earned income increased from 51.8 percent in the lowest quintile to 74.0 percent in the 4th quintile, while the earned income share of the highest quintile was slightly lower at 69.1 percent. The shares of household income accounted for by transfers and by property income move in opposite directions: the share accounted for by transfers falls progressively through the income quintiles from 45.6 percent for the lowest quintile to 7.0 percent for the highest quintile, while property

income shares income shares rise with income, ranging from 2.5 percent for the lowest quintile to 23.9 percent for the highest quintile.

The consumption shares by income quintile show much less dispersion than does income (Table 6). Mean expenditures per household for the highest quintile were a bit more than twice as high for the top quintile as for the lowest quintile, versus a disposable household income ratio of nearly 9 to 1. The largest differences in consumption between the lowest and highest quintiles were for education and for financial services and insurance. Mean expenditures for food and beverages purchased for home use showed only modest differences between the lowest and highest quintiles, while mean expenditures for food services and accommodations were 135 percent higher for the highest quintile compared to the lowest quintile. Mean expenditures for health ranged from \$8,352 for the lowest quintile to \$18,682 for the highest quintile. Within quintiles, the shares of expenditures accounted for by food, clothing, and housing and utilities decreased in moving from the lowest to the highest quintile, while the share accounted for by financial services and insurance increased steadily.

Household Type

The share of disposable household income accounted for by households with children fell by 3.0 percentage points from 2006 to 2010, from 31.1 percent to 28.1 percent (Table 7). Their real mean disposable household income fell, while the mean income of households with at least one member over 65 increased significantly. The earned income shares of disposable household income fell and the government social benefits and other transfers shares rose between 2006 and 2010 for all of the household types except for single households over 65. Property income shares of income fell for all household types except two adults with children between 2006 and 2010.

Mean expenditures were highest for households with two adults and at least one more than 65, followed by households with two adults and children (Table 8). The consumption shares accounted for by health expenditures were highest for households with at least one members older than 65. These household types also had the highest shares of consumption accounted for by housing, utilities, and fuels and by financial services and insurance.

Main Source of Income

The share of income accounted for by households in which government social benefits and other transfers were the main source of income increased by 3.3 percentage points between 2006 and 2010, to 12.8 percent, while the income shares accounted for by households whose main source of income was earned income and property income each fell (Table 9). Mean disposable income was highest for households whose main source of income was self-employment income or property income, and lowest for households whose main source of income was transfers and other sources. Real mean disposable household income fell between 2006 and 2010 for households where self-employment income was the largest source, while it rose for each of the other groups, including a 13.0 percent increase for households whose main source of income was property income.

Mean consumption expenditures were highest for households where property income was the main source of income, and lowest for those whose principal source was government social benefits and other transfers (Table 10). Expenditures for the transfers group exceeded their disposable income, while the opposite was true for all other groups. A disproportionate share of health expenditures were accounted for by the group whose primary source was government social benefits and other transfers, and for this group, health expenditures were the highest share of consumption. For this group, 82.2 percent of their health expenditures were accounted for by in-kind government social benefits, including Medicare, Medicaid, State Children's Health Insurance Program (SCHIP), and other state and local medical care.

8. Comparison to Other Measures

The income distribution measures on a NIPA basis may be compared to the CPS-ASEC measures and also to measures produced by the Internal Revenue Service (IRS) in their Statistics of Income data.²⁷ Differences between the measures reflect both definitional and measurement differences. Among the definitional differences are the following:

- The NIPA estimates are after tax, while the money income and AGI measures are pre-tax.
- The NIPA estimates include both cash and in-kind social benefits, while money income only includes cash benefits and AGI excludes the great majority of social benefits.
- AGI includes capital gains (and losses), excluded from NIPA income and money income.

²⁷ There are no published IRS estimates of (adjusted gross) income (AGI) by quintiles. The quintile distribution of AGI was estimated using IRS data on the number of returns and AGI by income size class. These estimates are based on only those returns with positive AGI. (The IRS does produce AGI distributions by cumulative percentiles.)

- Money income and AGI include pension and annuity income and IRA distributions, which are excluded from the NIPA measure.
- NIPA estimates and money income measure the distribution of household income, while IRS estimates measure the distribution of income by tax-filing unit.

Income taxes have some redistributive effects, so that after-tax income will be more evenly distributed than pre-tax income. An indication of this is that the 50 percent of taxpayers with the lowest AGIs, accounting for 12.8 percent of total AGI in 2009, paid only 2.3 percent of the income taxes. Similarly, government social benefits are received disproportionately by those in the lower income ranges. In 2010, the 40 percent of households with the lowest disposable income accounted for 40 percent of all social benefits, even though they accounted for 16 percent of total disposable income. Capital gains, of course, work in the opposite direction. In 2009, the 12 percent of taxpayers with AGIs of \$100,000 or more accounted for 94 percent of all capital gains. Capital gains declined precipitously from \$779.5 billion in 2006 to \$231.5 billion in 2009. The use of the number of taxpayers in the IRS data has the effect of lowering the share of AGI accounted for by those in the lowest income groups, because many of those reporting low incomes are in the same households as higher income filers. Often, those reporting low incomes are the children of those reporting much higher incomes. Consolidation of these into single households with the higher-earning parents would reduce the number of low income reporters and raise the share of income reported by the lowest quintile.

Table 11 shows the distributions for 2006, 2009 (the latest year for IRS data) and 2010. For the lowest quintile, the NIPA shares of income are significantly higher than the CPS-ASEC and IRS shares. Compared to CPS-ASEC, much of the difference is accounted for by the presence of in-kind social benefits in the NIPA estimates and by the effects of income taxes on the distribution. Compared to a money income measure which excludes taxes and adds noncash government social benefits, the difference is much smaller. The rapid growth in in-kind social benefits between 2006 and 2010 contributed to the growth in the shares of the two lowest quintiles, while the shares in CPS-ASEC money income and equivalence-adjusted money income declined over this period. For the highest quintile, there are large differences between the NIPA and CPS-ASEC shares and the IRS shares. This is clearly related to the inclusion of capital gains (net of losses) in the IRS measure. The 4.3 percentage point drop in the highest quintile share of income in the IRS data between 2006 and 2009 is primarily accounted for by the very large drop in capital gains income.

7. Issues and Future Directions

The results presented in this paper are based on NIPA definitions and measures of income and expenditures. Strict application of the NIPA definitions in deriving estimates of income distribution yields some anomalous results, which are addressed below, along with consideration of the use of IRS data on individual income tax returns.

Pensions

In the NIPAs, employer contributions to pension plans and interest and dividends earned on pension plan assets are part of household income. Pension payments are not recognized in the NIPAs because they are treated as withdrawals from assets owned by households. Pension payments and IRA and self-employed retirement plan withdrawals are part of money income in the CPS-ASEC estimates, and taxable pensions and annuities and IRA distributions are part of AGI in the IRS estimates. A consequence of the NIPA treatment of pensions in developing estimates of income distribution is that households with pension income, who use that income to provide funds for their expenditures, have expenditures that exceed their income, often by large amounts. Disposable (after-tax) income is negative in some instances, when taxes exceed income from other sources, and the income estimates do not reflect the households' economic circumstances. As a result, such households are often placed into the lowest income quintile. Payments from collective pension plans are significant: they equaled \$836.4 billion in 2010, 7.5 percent of disposable household income. For purposes of measuring income distribution, the NIPA treatment should be changed, so that payments from collective pension funds are accounted for as part of household income and pension plan contributions and earnings excluded. This is consistent with the treatment in the 2008 *System of National Accounts*, where collective pension fund payments are treated as social benefits.²⁸

Capital Gains Taxes

In the NIPAs, capital gains (net of losses) are not included in household income, but capital gains taxes are included in the federal and state income taxes netted against household income to derive disposable household income. At the micro level, this means that households with significant capital gains income may record low or even negative disposable income, in

²⁸ In earlier estimates of the distribution of personal income (BEA 1973), employer contributions to pension, health, and welfare funds were excluded from personal income and private pension and annuity payments were added to personal income to derive "family personal income" used for the income distribution estimates.

many instances placing them in the lowest income quintile. If possible, capital gains taxes should be removed from income taxes in deriving the income distribution estimates.

IRS Data

The IRS data on individual income tax returns from the Statistics of Income program have a number of elements in common with NIPA household income, including wages and salaries, proprietors' income, interest and dividends including S corporation income, rents and royalties, Social Security benefits, and unemployment compensation. A motivation for using the data is that the IRS data better capture high-income households than do the CPS-ASEC data, which is especially important for estimates of property income and proprietors' income. There are two primary issues with the use of IRS data in deriving NIPA-based estimates of income distribution: timeliness and reporting unit differences. The most recent IRS public-use microdata on individual income tax returns is for 2007. Data for 2008 and 2009 and preliminary estimates for 2010 by source of income and AGI bracket have been published by IRS. The reporting unit for the IRS data is the tax-filing unit rather than the household. A household may have more than one tax filer, and conversely, some households may have no tax filers. The number of tax-filing units in 2010 was 142.9 million, versus 118.7 million households covered in CPS-ASEC. An IRS study of data for 1993 showed that the consolidation of tax filers into households overwhelmingly affected those tax returns reporting the lowest AGI (IRS 1997). Of the 115 million returns filed that year, 9 million were filed by dependents of other taxpayers, and the overwhelming majority of these taxpayers reports AGIs of less than \$10,000. To use the IRS data, some means would have to be found to consolidate taxpayer units into households using the IRS microdata and to extrapolate the IRS microdata after 1997 with the published IRS data. The IRS data would then have to be statistically matched to tax filers in the CPS-ASEC data, and nonfilers accounted for in the CPS-ASEC data.

Table 1				
Reconciliation of NIPA Personal Income and Money Income from CPS-ASEC				
	(Billions of dollars)		% Change 2006 to	\$ Change 2006 to 2010
	2006	2010		
Personal income	11268.1	12373.5	9.8	1105.5
Less: Nonprofit institution income included in personal income	88.7	84.9	(4.3)	(3.8)
Plus: Household transfer receipts from nonprofit institutions	69.6	80.1	15.2	10.6
Equals: Household income	11248.9	12368.8	10.0	1119.9
Less: Household income not comparable to money income	2021.0	2597.1	28.5	576.2
Employer contributions for employee pension and insurance funds	960.1	1,089.9	13.5	129.8
In-kind government social benefits 1/	760.0	1,031.6	35.7	271.6
Health benefits	724.0	955.6	32.0	231.6
Supplemental Nutrition Assistance Program (SNAP)	29.4	66.5	126.2	37.1
Energy assistance	3.0	4.9	62.5	1.9
Women's, Infants, and Children food benefits	3.6	4.6	28.1	1.0
Imputed interest received by depositors and insurance policyholders	402.9	456.8	13.4	53.9
Property income received by entities holding household assets	248.6	246.8	(0.7)	(1.8)
Rental income of owner-occupied housing	83.4	230.0	175.8	146.6
Other noncomparable household income	41.1	55.6	35.3	14.5
Less: Employee and self-employed contributions for social insurance	475.1	513.6	8.1	38.5
Household income exclusive of noncomparable items	9,227.9	9,771.6	5.9	543.7
Less: Scope differences for comparable items	116.9	127.2	8.8	10.3
Plus: CPS-ASEC not comparable to PCE	383.1	450.5	17.6	67.4
	329.3	387.9	17.8	58.6
Pensions, other retirement income, and survivor and disability benefits				
Financial assistance from outside the household	14.8	17.1	15.7	2.3
Alimony	4.7	5.1	9.3	0.4
Child support	25.8	26.5	2.6	0.7
Equals: Money income exclusive of measurement differences	9494.2	10094.9	6.3	600.8
Less: Measurement differences	1672.2	1986.9	18.8	314.7
Equals: Money income	7822.0	8108.0	3.7	286.0
Addendum:				
Household income per capita	37,645	39,928	6.1	2284
Household income per household	96,964	104,218	7.5	7254
Median household money income	48,201	49,445	2.6	1244
Mean household money income	66,570	67,530	1.4	960

1/ Government social benefits that are a combination of cash and in-kind benefits are not included.

Table 2				
Ratios of Money Income (MI) to Scope-Adjusted Household Income (HI) for Selected Comparable Components				
	(Dollars in billions)			
	2006	2010	% Change (Difference) 2006 to 2010	\$ Change (Difference) 2006 to 2010
Wages and salaries	0.992	0.966	-2.6	.....
Household income	6017.2	6353.7	5.6	336.5
Money income	5967.4	6137.4	2.8	170.0
\$ Difference	-49.8	-216.3	.....	-166.4
Proprietors' income	0.391	0.363	-7.3	.....
Household income	1122.9	1027.2	-8.5	-95.7
Money income	439.4	372.6	-15.2	-66.9
\$ Difference	-683.5	-654.7	.....	28.8
Property income with rents and royalties	0.370	0.308	-16.8	.....
Household income	1164.0	1072.3	-7.9	-91.8
Money income	430.8	330.2	-23.4	-100.6
\$ Difference	-733.2	-742.1	.....	-8.9
Cash government social benefits	0.747	0.691	-7.6	.....
Household income	774.5	1147.5	48.2	373.0
Money income	578.7	792.5	36.9	213.8
\$ Difference	-195.8	-355.0	.....	-159.2

Table 3				
Reconciliation of NIPA Personal Consumption Expenditures and Consumer Expenditures from BLS Consumer Expenditure Survey				
	(Billions of dollars)		% Change 2006 to 2010	\$ Change 2006 to 2010
	2006	2010		
Personal consumption expenditures	9301.0	10245.5	10.2	944.5
Less: Final consumption expenditures of nonprofit institutions	240.0	280.2	16.8	40.2
Equals: Household consumption expenditures	9061.0	9965.3	10.0	904.3
Less: Coverage adjustments (excluding government social benefits)	59.5	67.2	13.0	7.7
Equals: Scope-adjusted household consumption expenditures	9001.6	9898.1	10.0	896.6
Less: Definitional differences (net)	1207.0	1668.8	38.3	461.7
PCE not comparable to CE	3087.2	3523.9	14.1	436.7
Expenditures financed by government and employers	1,332.1	1,635.6	22.8	303.5
Government social benefits	762.9	1,028.1	34.8	265.2
Health benefits	724.0	955.6	32.0	231.6
Energy assistance	3.0	4.6	52.0	1.6
Education benefits	35.9	67.9	89.3	32.0
Employer-paid health insurance & workers' compensation	569.2	607.5	6.7	38.3
Imputed rental value of owner-occupied housing	1,124.8	1,215.1	8.0	90.3
Financial services and insurance	516.5	560.5	8.5	44.0
Financial services	450.1	511.0	13.5	60.8
Insurance	66.4	49.5	(25.3)	(16.8)
Net purchases of used motor vehicles	113.5	112.4	(1.0)	(1.1)
Food produced & consumed on farms	0.4	0.3	(21.5)	(0.1)
Less: CE not comparable to PCE	1880.2	1855.1	(1.3)	(25.1)
Expenses of owner-occupied housing	787.4	773.2	(1.8)	(14.2)
Used motor vehicles	151.5	134.9	(10.9)	(16.6)
Finance charges	41.4	35.5	(14.2)	(5.9)
State and local registration and license	12.1	13.5	11.6	1.4
Cash contributions incl alimony/child support	222.1	197.8	(11.0)	(24.3)
Life insurance/annuity premiums	38.3	38.5	0.6	0.2
Contributions to pensions and social security	588.0	612.1	4.1	24.0
Medicare premiums	39.4	49.7	26.0	10.2
Equals: CE expenditures exclusive of measurement differences	7794.5	8229.3	5.6	434.8
Less: Measurement differences	2042.8	2403.0	17.6	360.3
Equals: CE total expenditures	5751.8	5826.3	1.3	74.6
Addendum:				
Household consumption expenditures (scope-adjusted) per capita	30,124	31,953	6.1	1828.8
Household consumption expenditures (scope-adjusted) per consumer unit	75,743	81,730	7.9	5987.1
Average annual consumer expenditures (CE)	48,398	48,109	(0.6)	(289.0)

Table 4			
Scope Adjustments to Household Income and Outlays by Type and Component			
(Billions of dollars)			
Label	2010		
	Published #	Scope Adjustments	Scope-Adjusted
Household income	12,400.1	443.0	11,957.1
Compensation of employees, received	7,971.4	80.7	7,890.6
Proprietors' income with inventory valuation and capital consumption adjustments	1,036.4	9.2	1,027.2
Rental income of households with capital consumption adjustment	343.6	7.4	336.2
Household income receipts on assets	1,678.4	37.1	1,641.3
Household current transfer receipts	2,357.2	318.5	2,038.7
Government social benefits	2,221.1	316.8	1,904.3
Other household current transfer receipts	136.1	1.7	134.5
Less: Contributions for government social insurance, domestic	986.8	9.8	977.0
Less: Household current taxes	1,193.9	41.6	1,152.2
Equals: Disposable household income	11,206.3	401.4	10,804.9
Less: Household outlays	10,547.9	345.3	10,202.5
Household consumption expenditures	9,965.3	326.1	9,639.2
Household interest payments	173.4	6.2	167.2
Household transfer payments	409.2	13.0	396.2
Equals: Household saving	658.4	56.1	602.3
Household saving as a percentage of household disposable income	5.9%	-	5.6%
Scope Adjustments to Household Income by Type	.....	443.0	.....
Institutionalized	.....	163.4	.....
Medicare & Medicaid	.....	78.1	.....
Other	.....	85.3	.....
Decedents	.....	248.6	.....
Medicare & Medicaid	.....	195.5	.....
Other	.....	53.1	.....
U.S. residents not physically present in U.S.	.....	28.2	.....
Federal civilian and military personnel stationed abroad	.....	27.1	.....
Wages of private U.S. residents abroad	.....	1.1	.....
Domestic military living on post	.....	15.5	.....
Foreign students and foreign temporary workers in U.S.	.....	-12.7	.....
Addendum:			
Medicare and Medicaid	.....	273.6	.....

Differs from values published in NIPA Table 2.9 by amount of alimony and child support received (income) and paid (outlays)

Table 5. Income Quintiles			
(Billions of dollars)			
	2006	2010	Change
Shares of Disposable Household Income of Quintiles			
Lowest	4.9	5.4	0.5
Second	10.1	10.5	0.4
Third	14.8	15.0	0.2
Fourth	21.8	22.0	0.2
Highest	48.4	47.1	(1.3)
Mean Disposable Household Income of Quintiles			
Lowest	20110	24424	4,314
Second	41798	47742	5,944
Third	61345	68254	6,910
Fourth	90253	100193	9,940
Highest	200521	214330	13,810
Overall	82805	90989	8,184
Mean Disposable Household Income of Quintiles in 2010 Dollars			
Lowest	21,808	24424	2,616
Second	45,328	47742	2,414
Third	66,525	68254	1,729
Fourth	97,874	100193	2,318
Highest	217,454	214330	(3,124)
Overall	89798	90989	1,191
Earned income shares by quintile			
Lowest	59.6	51.8	(7.7)
Second	60.6	53.7	(6.8)
Third	69.5	63.0	(6.4)
Fourth	77.1	74.0	(3.1)
Highest	70.1	69.1	(1.0)
Overall	70.1	66.9	(3.2)
Property income share by quintile			
Lowest	3.2	2.5	(0.7)
Second	7.8	7.4	(0.4)
Third	10.2	9.7	(0.5)
Fourth	12.4	12.1	(0.3)
Highest	24.5	23.9	(0.6)
Overall	17.2	16.5	(0.6)
Government social benefits/other transfers share by quintile			
Lowest	37.2	45.6	8.4
Second	31.7	38.9	7.3
Third	20.3	27.2	6.9
Fourth	10.5	14.0	3.4
Highest	5.4	7.0	1.5
Overall	12.7	16.6	3.8
# Differs from values published in NIPA Table 2.9 by amount of alimony and child support received (income) and paid (outlays)			

Table 6. Household Consumption Expenditures by Quintiles						
	2010					
	Lowest	Second	Third	Fourth	Highest	Overall
	(Billions of dollars)					
Total	1354.8	1567.7	1824.4	2139.8	2752.5	9639.2
Food and beverages purchased for off-premises consumption	140.8	146.1	141.9	157.5	170.1	756.5
Clothing, footwear, and related services	61.8	62.4	61.0	64.6	95.6	345.5
Housing, utilities, and fuels	286.4	329.4	376.2	427.1	487.6	1906.6
Furnishings, household equipment, and routine household maintenance	58.3	61.1	70.7	94.1	126.9	411.1
Health	198.4	333.3	391.5	403.4	443.7	1770.3
Transportation	139.2	157.9	189.8	245.0	268.7	1000.6
Communication	39.3	45.3	47.4	52.1	51.3	235.4
Recreation	146.5	128.8	155.2	211.7	261.9	904.1
Education	25.5	19.1	27.7	49.0	126.1	247.4
Food services and accommodations	83.8	87.6	106.8	135.1	197.4	610.6
Financial services and insurance	66.6	83.1	117.0	156.8	353.0	776.5
Other goods and services	108.2	113.7	139.2	143.4	170.1	674.6
	Mean expenditures per household					
Total	57049	66004	76822	90097	115893	81173
Food and beverages purchased for off-premises consumption	5930	6152	5977	6632	7161	6371
Clothing, footwear, and related services	2603	2628	2571	2718	4027	2909
Housing, utilities, and fuels	12060	13867	15840	17982	20529	16056
Furnishings, household equipment, and routine household maintenance	2454	2571	2978	3963	5343	3462
Health	8352	14034	16486	16985	18682	14908
Transportation	5862	6647	7993	10316	11314	8427
Communication	1655	1909	1996	2192	2161	1983
Recreation	6169	5424	6534	8914	11027	7614
Education	1074	803	1166	2064	5309	2083
Food services and accommodations	3530	3687	4496	5689	8310	5142
Financial services and insurance	2806	3497	4925	6602	14865	6539
Other goods and services	4555	4786	5861	6040	7163	5681
	Share of consumption by quintile					
Total	14.1	16.3	18.9	22.2	28.6	100.0
Food and beverages purchased for off-premises consumption	18.6	19.3	18.8	20.8	22.5	100.0
Clothing, footwear, and related services	17.9	18.1	17.7	18.7	27.7	100.0
Housing, utilities, and fuels	15.0	17.3	19.7	22.4	25.6	100.0
Furnishings, household equipment, and routine household maintenance	14.2	14.9	17.2	22.9	30.9	100.0
Health	11.2	18.8	22.1	22.8	25.1	100.0
Transportation	13.9	15.8	19.0	24.5	26.9	100.0
Communication	16.7	19.3	20.1	22.1	21.8	100.0
Recreation	16.2	14.2	17.2	23.4	29.0	100.0
Education	10.3	7.7	11.2	19.8	51.0	100.0
Food services and accommodations	13.7	14.3	17.5	22.1	32.3	100.0
Financial services and insurance	8.6	10.7	15.1	20.2	45.5	100.0
Other goods and services	16.0	16.9	20.6	21.3	25.2	100.0
	Consumption shares within quintiles					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Food and beverages purchased for off-premises consumption	10.4	9.3	7.8	7.4	6.2	7.8
Clothing, footwear, and related services	4.6	4.0	3.3	3.0	3.5	3.6
Housing, utilities, and fuels	21.1	21.0	20.6	20.0	17.7	19.8
Furnishings, household equipment, and routine household maintenance	4.3	3.9	3.9	4.4	4.6	4.3
Health	14.6	21.3	21.5	18.9	16.1	18.4
Transportation	10.3	10.1	10.4	11.4	9.8	10.4
Communication	2.9	2.9	2.6	2.4	1.9	2.4
Recreation	10.8	8.2	8.5	9.9	9.5	9.4
Education	1.9	1.2	1.5	2.3	4.6	2.6
Food services and accommodations	6.2	5.6	5.9	6.3	7.2	6.3
Financial services and insurance	4.9	5.3	6.4	7.3	12.8	8.1
Other goods and services	8.0	7.3	7.6	6.7	6.2	7.0

Table 7. Disposable Household Income by Household Type			
	2006	2010	Change
Shares of Disposable Household Income			
Single up to 65	10.3	10.4	0.1
Single older than 65	4.3	4.8	0.5
Single w/ children	3.4	3.1	(0.3)
Two adults up to 65	24.0	24.6	0.6
Two adults at least one more than 65	9.3	9.6	0.3
Two adults w/ children	27.7	25.0	(2.7)
Other	21.0	22.4	1.4
Mean Disposable Household Income (dollars)			
Single up to 65	48774	52616	3,841
Single older than 65	36605	46105	9,500
Single w/ children	48704	51993	3,288
Two adults up to 65	92202	101771	9,570
Two adults at least one more than 65	81665	99932	18,267
Two adults w/ children	106256	112817	6,562
Other	113297	127091	13,794
Overall	82805	90989	8,184
Mean Disposable Household Income in 2010 Dollars			
Single up to 65	52,893	52616	(277)
Single older than 65	39,696	46105	6,408
Single w/ children	52,817	51993	(825)
Two adults up to 65	99,988	101771	1,783
Two adults at least one more than 65	88,561	99932	11,370
Two adults w/ children	115,229	112817	(2,411)
Other	122,864	127091	4,227
Overall	89,798	90989	1,192
Earned income shares of total disposable household income			
Single up to 65	74.5	72.7	(1.8)
Single older than 65	10.9	13.6	2.7
Single w/ children	65.0	58.2	(6.8)
Two adults up to 65	76.2	74.8	(1.3)
Two adults at least one more than 65	24.9	22.9	(2.1)
Two adults w/ children	83.1	79.4	(3.7)
Other	75.5	71.5	(4.0)
Overall	70.1	66.9	(3.2)
Property income share by quintile			
Single up to 65	16.0	14.1	(2.0)
Single older than 65	39.5	37.7	(1.8)
Single w/ children	7.7	7.0	(0.7)
Two adults up to 65	17.3	14.9	(2.5)
Two adults at least one more than 65	39.7	39.6	(0.1)
Two adults w/ children	10.8	11.4	0.5
Other	13.2	12.7	(0.5)
Overall	17.2	16.5	(0.6)
Government social benefits/other transfers share by quintile			
Single up to 65	9.5	13.2	3.7
Single older than 65	49.6	48.7	(0.9)
Single w/ children	27.3	34.8	7.5
Two adults up to 65	6.5	10.3	3.8
Two adults at least one more than 65	35.4	37.6	2.2
Two adults w/ children	6.1	9.2	3.1
Other	11.3	15.7	4.4
Overall	12.7	16.6	3.8

Table 8. Household Consumption Expenditures by Household Type

	2010						Other	Overall
	Single up to 65	Single older than 65	Single w/ children	Two adults up to 65	Two adults at least one more than 65	Two adults w/ children		
	(Billions of dollars)							
Total	1200.9	517.0	339.7	1857.2	1018.3	2182.2	1658.0	8773.3
Food and beverages purchased for off-premises consumption	68.9	32.8	26.6	137.1	71.7	179.2	149.2	665.5
Clothing, footwear, and related services	35.1	10.5	19.1	69.1	27.8	108.1	69.4	339.0
Housing, utilities, and fuels	236.0	126.0	65.3	346.1	211.6	393.9	319.6	1698.5
Furnishings, household equipment, and routine household	48.1	23.8	14.4	98.5	57.1	115.1	77.4	434.4
Health	202.8	127.7	62.4	287.6	193.8	329.3	258.6	1462.3
Transportation	125.5	34.3	40.8	246.1	99.5	280.6	213.2	1040.1
Communication	26.6	12.0	9.9	42.6	23.0	47.8	43.3	205.1
Recreation	144.3	35.8	32.2	175.9	93.9	229.7	146.6	858.4
Education	30.0	3.1	4.4	41.2	4.0	52.4	57.9	193.1
Food services and accommodations	86.2	20.6	16.3	131.8	51.7	134.4	103.1	544.0
Financial services and insurance	98.5	58.3	18.1	165.0	121.7	152.9	114.5	729.0
Other goods and services	99.1	32.2	30.2	116.0	62.6	158.6	105.2	603.8
	Mean expenditures per household							
Total	56000	45692	52327	70969	98063	91212	87169	73881
Food and beverages purchased for off-premises consumption	3214	2901	4092	5240	6908	7489	7843	5604
Clothing, footwear, and related services	1635	924	2935	2642	2672	4520	3651	2855
Housing, utilities, and fuels	11004	11136	10056	13225	20378	16465	16803	14303
Furnishings, household equipment, and routine household	2245	2102	2213	3763	5500	4813	4067	3658
Health	9454	11289	9618	10992	18659	13765	13598	12314
Transportation	5851	3031	6291	9406	9583	11729	11208	8759
Communication	1242	1057	1526	1626	2214	1997	2276	1727
Recreation	6728	3162	4964	6721	9043	9603	7709	7229
Education	1398	273	685	1576	387	2192	3046	1627
Food services and accommodations	4018	1817	2508	5037	4977	5617	5419	4581
Financial services and insurance	4591	5153	2791	6307	11716	6391	6019	6139
Other goods and services	4619	2847	4648	4433	6026	6631	5530	5085
	Share of consumption by household type							
Total	13.7	5.9	3.9	21.2	11.6	24.9	18.9	100.0
Food and beverages purchased for off-premises consumption	10.4	4.9	4.0	20.6	10.8	26.9	22.4	100.0
Clothing, footwear, and related services	10.3	3.1	5.6	20.4	8.2	31.9	20.5	100.0
Housing, utilities, and fuels	13.9	7.4	3.8	20.4	12.5	23.2	18.8	100.0
Furnishings, household equipment, and routine household	11.1	5.5	3.3	22.7	13.1	26.5	17.8	100.0
Health	13.9	8.7	4.3	19.7	13.3	22.5	17.7	100.0
Transportation	12.1	3.3	3.9	23.7	9.6	27.0	20.5	100.0
Communication	13.0	5.8	4.8	20.7	11.2	23.3	21.1	100.0
Recreation	16.8	4.2	3.8	20.5	10.9	26.8	17.1	100.0
Education	15.5	1.6	2.3	21.4	2.1	27.2	30.0	100.0
Food services and accommodations	15.8	3.8	3.0	24.2	9.5	24.7	18.9	100.0
Financial services and insurance	13.5	8.0	2.5	22.6	16.7	21.0	15.7	100.0
Other goods and services	16.4	5.3	5.0	19.2	10.4	26.3	17.4	100.0
	Consumption shares for each household type							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food and beverages purchased for off-premises consumption	5.7	6.3	7.8	7.4	7.0	8.2	9.0	7.6
Clothing, footwear, and related services	2.9	2.0	5.6	3.7	2.7	5.0	4.2	3.9
Housing, utilities, and fuels	19.7	24.4	19.2	18.6	20.8	18.1	19.3	19.4
Furnishings, household equipment, and routine household	4.0	4.6	4.2	5.3	5.6	5.3	4.7	5.0
Health	16.9	24.7	18.4	15.5	19.0	15.1	15.6	16.7
Transportation	10.4	6.6	12.0	13.3	9.8	12.9	12.9	11.9
Communication	2.2	2.3	2.9	2.3	2.3	2.2	2.6	2.3
Recreation	12.0	6.9	9.5	9.5	9.2	10.5	8.8	9.8
Education	2.5	0.6	1.3	2.2	0.4	2.4	3.5	2.2
Food services and accommodations	7.2	4.0	4.8	7.1	5.1	6.2	6.2	6.2
Financial services and insurance	8.2	11.3	5.3	8.9	11.9	7.0	6.9	8.3
Other goods and services	8.2	6.2	8.9	6.2	6.1	7.3	6.3	6.9

Table 9. Household Income by Main Source of Income			
	2006	2010	Change
Shares of Household Income			
Compensation of employees	68.3	67.6	(0.6)
Self-employment income	11.1	9.0	(2.1)
Property Income	11.1	10.5	(0.6)
Transfers and other	9.6	12.8	3.3
Mean Disposable Household Income (dollars)			
Compensation of employees	84737	96189	11,452
Self-employment income	182491	189606	7,115
Property Income	129638	158862	29,223
Transfers and other	38472	46853	8,381
Overall	82805	90989	8,184
Mean Disposable Household Income in 2010 Dollars			
Compensation of employees	91,893	96189	4,296
Self-employment income	197,902	189606	(8,296)
Property Income	140,586	158862	18,276
Transfers and other	41,721	46853	5,133
Overall	89,798	90989	1,191

Table 10. Household Consumption Expenditures by Main Source of Income					
	2010				
	Compensation of employees	Self- employment income	Property Income	Transfers and other	Total
	(Billions of dollars)				
Total	6665.4	365.1	690.0	1918.7	9639.2
Food and beverages purchased for off-premises consumption	535.6	30.4	40.0	150.5	756.5
Clothing, footwear, and related services	264.0	15.8	16.1	49.5	345.5
Housing, utilities, and fuels	1337.0	68.9	135.7	365.0	1906.6
Furnishings, household equipment, and routine household maintenance	290.6	16.4	35.1	68.9	411.1
Health	1061.7	62.3	117.2	529.2	1770.3
Transportation	762.6	35.6	59.6	142.8	1000.6
Communication	173.3	7.7	12.8	41.6	235.4
Recreation	646.4	38.3	55.0	164.4	904.1
Education	168.2	8.6	7.3	63.3	247.4
Food services and accommodations	469.9	21.5	38.2	81.0	610.6
Financial services and insurance	483.9	29.8	135.9	127.0	776.5
Other goods and services	472.2	29.7	37.1	135.6	674.6
	Mean expenditures per household				
Total	90056	68635	93095	59952	81173
Food and beverages purchased for off-premises consumption	7237	5720	5394	4702	6371
Clothing, footwear, and related services	3567	2979	2177	1546	2909
Housing, utilities, and fuels	18064	12957	18307	11404	16056
Furnishings, household equipment, and routine household maintenance	3926	3092	4742	2153	3462
Health	14345	11704	15808	16535	14908
Transportation	10304	6690	8044	4462	8427
Communication	2342	1456	1724	1299	1983
Recreation	8734	7191	7424	5136	7614
Education	2272	1609	989	1979	2083
Food services and accommodations	6349	4046	5155	2531	5142
Financial services and insurance	6537	5601	18329	3967	6539
Other goods and services	6380	5589	5003	4237	5681
	Share of consumption by main source of income				
Total	69.1	3.8	7.2	19.9	100.0
Food and beverages purchased for off-premises consumption	70.8	4.0	5.3	19.9	100.0
Clothing, footwear, and related services	76.4	4.6	4.7	14.3	100.0
Housing, utilities, and fuels	70.1	3.6	7.1	19.1	100.0
Furnishings, household equipment, and routine household maintenance	70.7	4.0	8.6	16.8	100.0
Health	60.0	3.5	6.6	29.9	100.0
Transportation	76.2	3.6	6.0	14.3	100.0
Communication	73.6	3.3	5.4	17.7	100.0
Recreation	71.5	4.2	6.1	18.2	100.0
Education	68.0	3.5	3.0	25.6	100.0
Food services and accommodations	77.0	3.5	6.3	13.3	100.0
Financial services and insurance	62.3	3.8	17.5	16.4	100.0
Other goods and services	70.0	4.4	5.5	20.1	100.0
	Consumption shares for each main source of income type				
Total	100.0	100.0	100.0	100.0	100.0
Food and beverages purchased for off-premises consumption	8.0	8.3	5.8	7.8	7.8
Clothing, footwear, and related services	4.0	4.3	2.3	2.6	3.6
Housing, utilities, and fuels	20.1	18.9	19.7	19.0	19.8
Furnishings, household equipment, and routine household maintenance	4.4	4.5	5.1	3.6	4.3
Health	15.9	17.1	17.0	27.6	18.4
Transportation	11.4	9.7	8.6	7.4	10.4
Communication	2.6	2.1	1.9	2.2	2.4
Recreation	9.7	10.5	8.0	8.6	9.4
Education	2.5	2.3	1.1	3.3	2.6
Food services and accommodations	7.0	5.9	5.5	4.2	6.3
Financial services and insurance	7.3	8.2	19.7	6.6	8.1
Other goods and services	7.1	8.1	5.4	7.1	7.0

Table 11 Estimates of Income Distribution									
(Percent of total)									
	National accounts disposable household income (DHI)	CPS-ASEC Measures			Internal Revenue Service (IRS) adjusted gross income #	DHI Differences With Other Measures			
		Money income	Equivalence-adjusted money income	Money income less taxes plus noncash transfers		Money income	Equivalence-adjusted money income	Money income less taxes plus noncash transfers	IRS Adjusted Gross Income
2006									
Lowest quintile	4.9	3.4	3.7	_____	2.0	1.5	1.2	_____	2.9
Second quintile	10.1	8.6	9.4	_____	4.7	1.5	0.7	_____	5.4
Middle quintile	14.8	14.5	15.0	_____	10.8	0.3	-0.2	_____	4.0
Fourth quintile	21.8	22.9	22.5	_____	19.0	-1.1	-0.7	_____	2.8
Highest quintile	48.4	50.5	49.4	_____	63.6	-2.1	-1.0	_____	-15.2
2009									
Lowest quintile	5.1	3.4	3.4	4.6	2.2	1.7	1.7	0.5	2.9
Second quintile	10.4	8.6	9.2	10.8	6.4	1.8	1.2	-0.4	4.0
Middle quintile	15.1	14.6	15.0	16.3	11.6	0.5	0.1	-1.2	3.5
Fourth quintile	22.0	23.2	22.9	23.9	20.5	-1.2	-0.9	-1.9	1.5
Highest quintile	47.4	50.3	49.4	44.4	59.3	-2.9	-2.0	3.0	-11.9
2010 *									
Lowest quintile	5.4	3.3	3.3	_____	_____	2.1	2.1	_____	_____
Second quintile	10.5	8.5	9.2	_____	_____	2.0	1.3	_____	_____
Middle quintile	15	14.6	15.1	_____	_____	0.4	-0.1	_____	_____
Fourth quintile	22	23.4	23.2	_____	_____	-1.4	-1.2	_____	_____
Highest quintile	47.1	50.2	49.3	_____	_____	-3.1	-2.2	_____	_____
2006-2009 Change									
Lowest quintile	0.2	0.0	-0.3	_____	0.2	0.2	0.5	_____	0.0
Second quintile	0.3	0.0	-0.2	_____	1.7	0.3	0.5	_____	-1.4
Middle quintile	0.3	0.1	0.0	_____	0.8	0.2	0.3	_____	-0.5
Fourth quintile	0.2	0.3	0.4	_____	1.5	-0.1	-0.2	_____	-1.3
Highest quintile	-1.0	-0.2	0.0	_____	-4.3	-0.8	-1.0	_____	3.3
2006-2010 Change									
Lowest quintile	0.5	-0.1	-0.4	_____	_____	0.6	0.9	_____	_____
Second quintile	0.4	-0.1	-0.2	_____	_____	0.5	0.6	_____	_____
Middle quintile	0.2	0.1	0.1	_____	_____	0.1	0.1	_____	_____
Fourth quintile	0.2	0.5	0.7	_____	_____	-0.3	-0.5	_____	_____
Highest quintile	-1.3	-0.3	-0.1	_____	_____	-1.0	-1.2	_____	_____
* IRS data only available through 2009.									
# Returns with positive adjusted gross income.									

References

Articles and Papers

National Economic Accounts (NEA)

European Commission, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations, World Bank. [*System of National Accounts 2008*](#). New York, 2009.

Fixler, Dennis and David Johnson. “[Accounting for the Distribution of Income in the U.S. National Accounts](#)”. Prepared for NBER Conference on Research in Income and Wealth: Measuring Economic Sustainability & Progress, August 6-8 2012, Boston.

Stiglitz, Joseph E., Amartya Sen, and Jean-Paul Fitoussi, “[Report by the Commission on the Measurement of Economic Performance and Social Progress.](#)” Commission on the Measurement of Economic Performance and Social Progress, September 2009.

State Personal Income (SPI)

U.S. Bureau of Economic Analysis, Regional Income Division. [*State Personal Income and Employment Methodology*](#). U.S. Department of Commerce, Bureau of Economic Analysis, September 2011.

U.S. Bureau of Economic Analysis, Regional Income Division. “[Regional Quarterly Report.](#)” *Survey of Current Business*. 91:10 (October 2011).

Current Population Survey Annual Social and Economic Supplement estimates of household money income (CPS-ASEC)

DeNavas-Walt, Carmen, Bernadette D. Proctor, and Jessica C. Smith. Current Population Reports, P60-239, [*Income, Poverty, and Health Insurance Coverage in the United States: 2010*](#). U.S. Census Bureau, September 2011.

Roemer, Marc I, [Assessing the Quality of the March Current Population Survey and the Survey of Income and Program Participation Income Estimates, 1990 – 1996.](#) U.S. Bureau of the Census, June 2000.

Ruser, John, Adrienne Pilot, Charles Nelson. [“Alternative Measures of Household Income: BEA Personal Income, CPS Money Income, and Beyond.”](#) . U.S. Bureau of Economic Analysis and U.S Census Bureau. Prepared for Federal Economic Statistics Advisory Committee, November 2004.

U.S. Census Bureau. [Current Population Survey Design and Methodology: Technical Paper 66,](#) October 2006.

U.S Census Bureau, Current Population Reports, P60-200, 1998. [Money Income in the United States: 1997.](#) U.S. Government Printing Office, Washington, DC., August 1998.

Bureau of Labor Statistics estimates of consumer income and expenditures (CE)

Attanasio, Orazio P., Erich Battistin, and Andrew Leicester. “From Micro to Macro, from Poor to Rich: Consumption and Income in the UK and the US,” working paper, University College London, 2006.

Bee, Adam, Bruce D. Meyer, James X. Sullivan. ["The Validity of Consumption Data: Are the Consumer Expenditure Interview and Diary Surveys Informative?"](#) Prepared for Conference on Improving Measures of Consumer Expenditures sponsored by Conference for Research in Income and Wealth and National Bureau of Economic Research, Washington, DC, December 2-3, 2011.

Barry Bosworth. [“Price Deflators, the Trust Fund Forecast, and Social Security Solvency”](#). WP 2010-12, Center for Retirement Research at Boston College, 2010.

Passero, William, Thesia I. Garner, Clinton McCully, [“Understanding the Relationship: CE Survey and PCE.”](#) Prepared for Conference on Improving Measures of Consumer Expenditures sponsored by Conference for Research in Income and Wealth and National Bureau of Economic Research, Washington, DC, December 2-3, 2011.

Stephens, Melvin, Jr. “3rd of the Month: Do Social Security Recipients Smooth Consumption Between Checks?” American Economic Review 93(1): 406-422, 2003.

U.S. Bureau of Labor Statistics (BLS). “Consumer Expenditure Survey: Diary Survey, 1980-81”, Bulletin 2173, U.S. Department of Labor, September 1983.

U.S. Bureau of Labor Statistics., [*2010 Consumer Expenditure Interview Survey Public Use Microdata: User’s Documentation*](#). Washington, DC: BLS, September 2011.

U.S. Bureau of Labor Statistics. *BLS Handbook of Methods*. [Chapter 16: Consumer Expenditures and Income](#). Updated September 2011.

Internal Revenue Service estimates of individual income tax returns (IRS)

Sailer, Peter and Michael Weber, “Household and Individual Income Data from Tax Returns.” Internal Revenue Service, 1997. Accessed at IRS: http://www.irs.gov/file_source/pub/irs-soi/petasa98.pdf

Bryan, Justin. “[Individual Income Tax Returns, 2009](#).” *Statistics of Income (SOI) Bulletin—Fall 2011*. Internal Revenue Service, 2011.

Decennial Census of Population and Housing (CPH)

Census 2000 PUMS Tech. U.S. Census Bureau. [Census 2000 5% Public Use Microdata Sample \(PUMS\): Technical Documentation](#), October 2008.

Census 2000 SF1. U.S. Census Bureau. [Census 2000 Summary File 1: Technical Documentation](#), July 2007.

Medicare and Medicaid Expenditures in the Last Year of Life (MED)

Hoover, Donald R. Stephen Crystal, Rizie Kumar, Usha Sambamoorthi, and Joel C. Cantor. “Medical Expenditures during the Last Year of Life: Findings from the 1992–1996 Medicare Current Beneficiary Survey.” *Health Services Research*. HSR 37:6 (December 2002). Accessed at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1464043/>

Riley, Gerald F. and James D. Lubitz. “[Long-Term Trends in Medicare Payments in the Last Year of Life](#).” *Health Services Research*. HSR 45:2 (April 2010).

Historical studies of the distribution of household income on a national accounts basis

Goldsmith, Selma M. "Changes in the Size Distribution of Income." *American Economic Review*, Vol. 47, No. 2, Papers and Proceedings of the Sixty-eighth Annual Meeting of the American Economic Association (May, 1957), pp. 504-518

U.S. Department of Commerce, Office of Business Economics. *Supplement to the Survey of Current Business: Income Distribution in the United States*. U.S. Government Printing Office, Washington, DC, 1953.

U.S. Bureau of Economic Analysis. *Size Distribution of Family Personal Income: Methodology and Estimates for 1964*. Bureau of Economics Staff Paper No. 21, June 1973.

Tables

National Income and Product Account Tables Accessed at
<http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1>

- 1.13 National Income by Sector, Legal Form of Organization, and Type of Income
- 2.1 Personal Income and Its Disposition
- 2.9 Personal Income and Its Disposition by Households and by Nonprofit Institutions Serving Households
- 3.6 Contributions for Government Social Insurance
- 6.2D Compensation of Employees by Industry
- 6.3D Wage and Salary Accruals by Industry
- 6.11D Employer Contributions for Employee Pension and Insurance Funds by Industry and by Type
- 7.12 Imputations in the National Income and Product Accounts
- 7.14 Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service

Income Distribution Tables in Survey of Current Business (July 1959 through July 1964)
accessed at St. Louis Federal Reserve Bank: <http://fraser.stlouisfed.org/publication/?pid=46>.

- II-11 (18,17 <July 1963>). Distributions of Consumer Units and Their Family Personal Income, by Income Brackets
- II-12 (18, 17 <July 1963>) Distributions of Nonfarm Families, Farm Operator Families, and Unattached Individuals and Their Family Personal Income by Income Brackets

II-13 (19, 18 <July 1963>). Distribution of Family Personal Income Among Quintiles of Consumer Units

State Personal Income Tables

Accessed at <http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1&isuri=1&acrdn=4>

SA06N Compensation by NAICS Industry

SA07N Wage and Salary Disbursements by NAICS Industry SA40 Property Income

SQ4 Personal Income and Its Components

CPS-ASEC Tables accessed at

<http://www.census.gov/hhes/www/income/data/incpovhlth/2010/index.html>

PINC-08 Source of Income in 2010-People 15 Years Old and Over, By Income of Specified Type in 2010, Age, Race, Hispanic Origin, and Sex

PINC-09 Source of Income in 2010-Number with Income and Mean Income of Specified Type in 2010 of People 15 Years Old and Over by Age, Race, and Hispanic Origin, and Sex

Internal Revenue Service (IRS) Tables accessed at <http://www.irs.gov/uac/Tax-Stats-2>

Table 1.4 All Returns: Sources of Income, Adjustments, and Tax Items, by Size of Adjusted Gross Income, Tax Year 2009

Websites

U.S. Bureau of the Census. Census 2000 Public Use 5% Microdata Sample.

http://www2.census.gov/census_2000/datasets/PUMS/FivePercent/

U.S. Department of Defense. DoD Personnel and Military Casualty Statistics.

<http://siadapp.dmdc.osd.mil/personnel/MMIDHOME.HTM> .

U.S. Department of Defense. Defense Finance and Accounting Services. Military pay tables.

<http://www.dfas.mil/militarymembers/payentitlements/militarypaytables.html>

Appendix Table 1 NIPA Income and Outlays and Micro Matches & Indicators, 2010									
NIPA Series	NIPA Values		Source	Type	Indicators/Matches		Value	Ratio to Adjusted NIPA Value	
	Published	Less: Coverage Adjustment			Equals: Scope-Adjusted Values	Series			
Household income receipts on assets	1,678.4	37.1			1,641.3				
Household interest income	972.3	21.8			950.4				
Monetary interest received by households	515.5	11.6			503.9				
Publicly administered government employee retirement plans	95.9	2.2	CPS	I	93.7	Wages and salaries of government employee pension plan participants	.....	.....
Private pension plan interest	80.8	1.8	CPS	I	79.0	Wages and salaries of private employee pension plan participants	.....	.....
Other monetary interest received by households	338.8	7.6			331.2	Interest income	159.7	0.482	
Imputed interest received by households	456.8	10.3			446.5				
Imputed interest received by households from banks, credit agencies, and investment companies	203.7	4.6			199.1				
Imputed interest received by households from depository institutions	124.9	2.8		I	122.1	Market value of checking and savings accounts	.....	.....
Imputed interest received by households from regulated investment companies (RICs)	78.8	1.8			77.0				
RICs to persons	61.0	1.4	CEI	I	59.6	Market value of all securities	.....	.....
RICs to private pensions	17.8	0.4	CPS	I	17.4	Wages and salaries of private employee pension plan participants	.....	.....
Life insurance carriers	247.0	5.5	CEI	I	241.4	Premiums for life, endowment, annuities, and other personal insurance	.....	.....
Imputed interest received from property and casualty insurance companies	6.2	0.1	CEI	I	6.0	Premiums for vehicle insurance and homeowners insurance	.....	.....
Household dividend income	706.1	15.3	CPS	PM	690.8	Dividend income	96.6	0.140	
Household current transfer receipts	2,357.2	318.5			2,038.7				
Government social benefits	2,221.1	316.8			1,904.3				
Benefits from social insurance funds	1,386.4	190.2			1,196.3				
Social security	690.2	35.7	CPS	XM	654.5	Social security income	574.0	0.877	
Medicare	518.4	152.3	CPS	XM	366.1	Person market value of Medicare	320.8	0.876	
Unemployment insurance	138.7	1.7	CPS	XM	136.9	Unemployment compensation income	99.1	0.724	
Railroad retirement	10.8	0.1	CPS	XM	10.6	Railroad retirement pension, disability, and survivor income	6.9	0.650	
Pension benefit guaranty	2.4	0.0	CPS	I	2.4	Pension income, other or don't know	.....	.....
Veterans' life insurance	1.4	0.0	CPS	I	1.4	Veterans' survivor benefits	.....	.....
Workers' compensation	14.9	0.2	CPS	PM	14.7	Workers' compensation state payments & workers' compensation disability & survivor benefits	5.3	0.361	
Military medical insurance	3.6	-	CPS	I	3.6	Participants in CHAMPUS, VA, or military health care	.....	.....
Temporary disability insurance	6.0	0.1	CPS	PM	5.9	State and local government employee disability & state temporary sickness	3.8	0.642	

Appendix Table 1 NIPA Income and Outlays and Micro Matches & Indicators, 2010							
NIPA Series	NIPA Values			Indicators/Matches			
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value
Other government social benefits	834.6	126.7	708.0				
Veterans' benefits	56.4	0.7	55.7				
Veterans pension and disability	48.4	0.6	47.8	CPS	XM	Veterans payments for disability compensation & pensions	33.0
Veterans readjustment (education & training)	8.0	0.1	7.9	CPS	PM	Veterans payments for education & other	2.7
Supplemental Nutrition Assistance Program (SNAP) (formerly Food Stamps)	66.5	0.8	65.7	CPS	XM	Food stamps value	37.6
Black lung benefits	0.4	0.0	0.4	CPS	XM	Black lung disability benefits	0.6
Supplemental security income	49.0	0.6	48.3	CPS	XM	Supplemental Security income	39.7
Refundable tax credits	96.5	1.2	95.3	CPS	PM	Earned income tax credit, Child tax credit, Additional Child tax credit, Make Work Pay tax credit	141.2
Public assistance and other income maintenance	459.9	122.0	338.0				
Medical care	420.5	121.5	299.0				
Medicaid	405.4	121.3	284.1	CPS	XM	Person market value of Medicaid	202.1
Other state & local medical care	15.1	0.2	14.9	CPS	I	Children covered by State Child Health Programs	.....
Other public assistance and income maintenance	39.5	0.5	39.0	CPS	PM	Public assistance	7.3
Energy assistance	4.9	0.1	4.8	CPS	PM	Energy assistance income	1.8
WIC food	4.6	0.1	4.5	CPS	I	Number receiving WIC	.....
Retired military personnel & dependents at nonmilitary facilities	5.7	0.1	5.7	CPS	I	Civilian households participating in CHAMPUS, VA, or military health care	.....
Education assistance	66.4	0.8	65.6	CPS	PM	Education assistance, total value government	16.7
State & local employment & training	1.5	0.0	1.4	CPS	I	Part-time with reason for part-time school/training	.....
Alaska dividend payments	0.8	0.0	0.8	CPS	I	All households living in Alaska	.....
All other government social benefits	22.1	0.3	21.8	CPS	PM	Other income, source of income = anything else	3.8
Household current transfer receipts from NPISHs	80.1	1.3	78.9	CPS	PM	Educational assistance, total value for scholarships, grants, etc. from school	19.2
Household current transfer receipts from other households	31.4	-	31.4				
Alimony received	5.1	-	5.1	CPS	XM	Alimony payments income	5.1
Child support received	26.3	-	26.3	CPS	XM	Child support income	26.3
Less: Contributions for government social insurance, domestic	986.8	9.8	977.0				
Employer's actual social contributions	473.2	4.9	468.2	CPS	PM	Social security retirement payroll deductions	458.9
Employee's actual social contributions	408.9	3.9	405.0	CPS	PM	Social security retirement payroll deductions	458.9
Self-employed's actual social contributions	104.7	1.0	103.7				
Self-employed	47.0	0.4	46.6	CPS	I	Self employment income+farm income	.....
Supplementary medical insurance (Medicare)	57.7	0.5	57.2	CEI	XM	Medicare payments and Medicare prescription drug premiums	50.2
							0.878

Appendix Table 1									
NIPA Income and Outlays and Micro Matches & Indicators, 2010									
NIPA Series	NIPA Values		Indicators/Matches		Type	Source	Ratio to Adjusted NIPA Value		
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Series			Value	Value	Ratio to Adjusted NIPA Value
Less: Household current taxes	1,193.9	41.6	1,152.2						
Federal	896.4	31.3	865.1	CPS	PM		Federal income tax liability, after all credits	915.3	1.058
State & local	297.5	10.4	287.1						
Income taxes	266.9	9.3	257.6	CPS	XM		State income tax liability, after all credits	229.6	0.891
Motor vehicle licenses	16.0	0.6	15.5	CEI	XM		Vehicle registration and driver's license fees	14.5	0.936
Personal property taxes	7.6	0.3	7.3	CEI	XM		Personal property taxes	4.7	0.644
Other taxes (hunting, fishing, other personal licenses)	7.0	0.2	6.7	CED	I		Fees for participant sports	.....	.....
Equals: Disposable household income	11,206.3	401.4	10,804.9						
Less: Household outlays	10,547.9	345.3	10,202.5						
Household consumption expenditures	9,965.3	326.1	9,639.2						
Household interest payments	173.4	6.2	167.2	CEI	PM		Vehicle and other nonmortgage interest	32.5	0.195
Household transfer payments	409.2	13.0	396.2						
To government	94.5	3.3	91.3	CEI	PM		Cash contributions to educational institutions	4.3	0.048
To the rest of the world (net)	48.9	1.7	47.3	CEI	PM		Other cash gifts	48.2	1.020
To nonprofit institutions	234.5	8.1	226.5	CEI	PM		Cash contributions to charities, religious organizations, educational institutions, political organizations, and other nonprofit organizations	152.4	0.673
To other households	31.2	-	31.2						
Alimony paid	4.5	-	4.5	CEI	XM		Alimony expenditures	4.5	1.000
Child support paid	26.7	-	26.7	CEI	XM		Child support expenditures	26.7	1.000
Equals: Household saving	658.4	56.1	602.3						
Household saving as a percentage of household disposable income	5.9%	-	5.6%						
CPS Current Population Survey Annual Social and Economic Supplement									
CEI Consumer Expenditure Interview Survey									
CED Consumer Expenditure Diary Survey									
XM Exact match									
PM Partial match									
I Indicator									
NOTE: CPS-ASEC and CE series may be combinations of variables.									

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Household Consumption Expenditures	9985.3	326.1	9639.2						
Food and beverages purchased for off-premises consumption	766.4	9.9	756.5						
Food and nonalcoholic beverages purchased for off-premises consumption	659.4	8.5	650.9	CED	XM	Food at home	438.9	0.674	
Alcoholic beverages purchased for off-premises consumption	106.6	1.3	105.3	CED	XM	Alcoholic beverages at home	27.0	0.257	
Food produced and consumed on farms	0.3	0.0	0.3	CPS	I	Farm income greater than zero	.....	.....
Clothing, footwear, and related services	350.7	5.2	345.5						
Clothing	290.9	4.3	286.6						
Garments	270.4	4.0	266.4						
Women's and girls' clothing (10)	161.2	2.4	158.8	CED(I)	XM	Women and girls apparel excluding accessories	71.7	0.451	
Men's and boys' clothing (11)	95.5	1.4	94.1	CED(I)	XM	Men and boys apparel excluding accessories	41.6	0.442	
Children's and infants' clothing (12)	13.7	0.2	13.5	CED(I)	XM	Children under 2 apparel	11.0	0.812	
Clothing materials	4.2	0.1	4.1	CED	XM	Material for making clothes/sewing patterns and notions	1.2	0.296	
Standard clothing issued to military personnel	0.4	0.2	0.2	CPS	I	Households with armed forces members	.....	.....
Cleaning, repair, and rental of clothing	15.9	0.1	15.8	CEI	XM	Laundry and dry cleaning, clothing rental, and alteration, tailoring, and repair of apparel	12.3	0.776	
Footwear	59.8	0.9	58.9	CED	XM	Footwear, shoe repair and other shoe service	36.9	0.626	
Housing, utilities, and fuels	1915.9	9.3	1906.6						
Housing	1583.8	7.7	1576.1						
Rental of tenant-occupied housing (farm, nonfarm, and group)	368.7	1.8	366.9	CEI	PM	Rent and unreimbursed tenants' maintenance and repair expenditures	342.6	0.934	
Imputed rental of owner-occupied housing (farm and nonfarm)	1215.1	5.9	1209.2	CEI	XM	Adjusted rental equivalence of owned home/vacation home/timeshares	1310.1	1.083	
Household utilities and fuels	332.1	1.6	330.5						
Water supply and sanitation (25)	85.7	0.4	85.2						
Water supply and sewage maintenance	69.2	0.3	68.9	CEI	PM	Water and sewerage maintenance	43.6	0.633	
Garbage and trash collection	16.4	0.1	16.4	CEI	PM	Trash and garbage collection	15.2	0.929	
Electricity, gas and other fuels	246.5	1.2	245.3						
Electricity (27)	168.4	0.8	167.6	CEI	PM	Electricity	171.1	1.021	
Natural gas (28)	55.4	0.3	55.1	CEI	PM	Natural gas	53.3	0.967	
Fuel oil and other fuels (29)	22.7	0.1	22.6						
Fuel oil	21.2	0.1	21.1	CEI	PM	Fuel oil and bottled gas	15.9	0.752	
Other fuels	1.5	0.0	1.5	CEI	PM	Coal, wood, and other fuels	1.1	0.718	

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010						
Label	NIPA Values			Indicators/Matches		
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series
Furnishings, household equipment, and routine household maintenance	413.1	2.0	411.1			
Furniture, furnishings, and floor coverings	129.7	0.6	129.1			
Furniture	81.6	0.4	81.2	CEI	XM	Furniture and furniture rental
Clocks, lamps, lighting fixtures, and other household decorative items	28.5	0.1	28.3	CEI	XM	Lamps and lighting fixtures, clocks and other household decorative items
Carpets and other floor coverings	18.6	0.1	18.5	CEI	PM	Floor coverings
Repair of furniture, furnishings, and floor coverings	1.0	0.0	1.0	CEI	XM	Reupholstering, furniture repair
Household textiles	37.8	0.2	37.6			
Window coverings	12.3	0.1	12.3	CEI	XM	Window coverings, curtains and drapes
Household linens	24.3	0.1	24.2	CEI	XM	Linens, slipcovers, decorative pillows, closet and storage items
Sewing items	1.2	0.0	1.2	CEI	XM	Sewing materials for slipcovers, curtains, other sewing materials for the home
Household appliances	44.5	0.2	44.3			
Major household appliances	34.5	0.2	34.3	CEI	XM	Major appliances and portable heating and cooling equipment
Small electric household appliances	6.1	0.0	6.1	CEI	XM	Small electric kitchen appliances
Repair of household appliances	4.0	0.0	4.0	CEI(D)	XM	Repair and rental of household appliances and equipment
Glassware, tableware, and household utensils	41.5	0.2	41.3			
Dishes and flatware	17.5	0.1	17.4	CEI(D)	XM	Plastic dinnerware, china and other dinnerware, flatware, glassware, silver and other serving pieces
Nonelectric cookware and tableware	24.1	0.1	24.0	CED	XM	Nonelectric cookware, tableware, nonelectric kitchenware, and miscellaneous household equipment and parts
Tools and equipment for house and garden	20.7	0.1	20.6			
Tools, hardware, and supplies	16.0	0.1	15.9	CEI(D)	PM	Power and hand tools, other hardware, and miscellaneous supplies and equipment
Outdoor equipment and supplies	4.8	0.0	4.8	CEI(D)	PM	Lawn and garden equipment and outdoor equipment
Other household goods and services	138.8	0.7	138.1			
Household cleaning products	41.3	0.2	41.1	CEI(D)	PM	Laundry and cleaning equipment, soaps and detergents, other laundry and cleaning products, lawn and garden supplies (pl), and termite and pest control products
Household paper products	40.3	0.2	40.1	CED	PM	Cleaning and toilet tissue, paper towels and napkins
Domestic services	23.8	0.1	23.7	CEI	XM	Housekeeping services
Miscellaneous household products	6.9	0.0	6.9	CED	PM	Miscellaneous household products
Moving, storage, and freight services	13.2	0.1	13.1	CEI	XM	Moving, storage, freight express, clothing storage
Other household services	13.2	0.1	13.2	CEI	XM	Water softening services, other home services, services for termite and pest control, and security services

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Health	2052.8	282.5	1770.3						
Health insurance	810.1	9.4	800.7						
Employer-paid health insurance	519.5	7.2	512.2	CPS	I	Employer contribution for health insurance	.....	.....
Employee and self-paid health insurance	290.7	2.1	288.5	CEI	I	Health insurance	.....	.....
Medicare, Medicaid, and other state and local health care	847.8	261.5	586.3						
Medicare	493.7	152.0	341.7	CPS	I	Person market value of Medicare	.....	.....
Medicaid	340.7	109.5	231.2	CPS	I	Person market value of Medicaid	.....	.....
Other state and local health care	13.4	0.0	13.4	CPS	I	Allocated to each child covered by CHIP program	.....	.....
Out-of-pocket and other expenditures	394.9	11.7	383.3						
Therapeutic appliances and equipment	32.4	0.8	31.6	CEI	PM	Supportive and convalescent medical equipment, hearing aids, medical equipment for general use, eyeglasses and eyecare services	13.9	0.440	
Pharmaceutical and other medical products	72.9	1.8	71.1	CEI	PM	Prescription drugs	42.4	0.596	
Other nondurable medical products	44.6	2.2	42.4	CED	XM	Non-prescription drugs, vitamins, topical and dressings	21.0	0.494	
Outpatient services	159.2	4.1	155.1	CEI	PM	Physicians' services; dental services; care for elderly, invalids, handicapped, etc. in the home, lab tests and x-rays; services by professionals other than physicians; other medical care services; rental of supportive, convalescent, and other medical equipment	71.2	0.459	
Hospitals	63.3	2.4	60.9	CEI	PM	Hospital room and service	13.8	0.226	
Nursing homes	22.5	0.4	22.1	CEI	PM	Care in convalescent or nursing home	0.9	0.042	
Transportation	967.0	-33.6	1000.6						
Motor vehicles	290.9	1.9	289.0						
New motor vehicles	178.5	1.2	177.3	CEI	XM	Net outlays for new cars and trucks plus trade-in allowance	171.5	0.967	
Net purchases of used motor vehicles	112.4	0.7	111.7	CEI	XM	Used cars and trucks less tradeins (on new and used vehicles) and sales	113.6	1.017	
Motor vehicle operation	592.3	6.9	585.4						
Motor vehicle parts and accessories	49.2	0.3	48.9						
Tires	22.7	0.1	22.5	CEI	XM	Tires - purchased, replaced, installed	16.9	0.750	
Accessories and parts	26.6	0.2	26.4	CED(I)	XM	Concordance	6.4	0.244	
Motor vehicle fuels, lubricants, and fluids	331.4	3.9	327.5						
Gasoline and other motor fuel	325.2	3.8	321.4	CEI	XM	Gasoline and diesel fuel	256.9	0.799	
Lubricants and fluids	6.2	0.1	6.1	CEI	XM	Motor oil, coolants, additives, brake and transmission fluids	1.8	0.300	
Motor vehicle maintenance and repair	153.0	1.9	151.2						
Motor vehicle body repair	25.4	0.3	25.1	CED	I	Auto insurance	.....	.....
Other motor vehicle maintenance & repair	127.6	1.6	126.1	CED(I)	XM	Maintenance and repair services excluding body work and painting	66.7	0.529	

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Other motor vehicle services	58.6	0.8	57.8						
Motor vehicle leasing	30.9	0.3	30.7						
Auto leasing	19.9	0.2	19.7	CEI	XM	Car lease downpayment, lease payments, and termination fees	11.9	0.605	
Truck leasing	11.1	0.1	11.0	CEI	XM	Truck lease downpayment, lease payments, and termination fees	8.8	0.801	
Motor vehicle rental	10.6	0.3	10.2	CEI	XM	Auto, truck, and other vehicle rental	4.8	0.469	
Parking fees and tolls	17.1	0.2	16.9	CEI	XM	Parking fees and tolls	7.6	0.448	
Public transportation	83.9	-42.4	126.3						
Ground transportation	30.9	0.8	30.1						
Railway transportation	1.0	0.1	1.0	CEI	XM	Intercity train fares	1.9	1.932	
Road transportation	29.9	0.8	29.1						
Intercity buses	1.1	0.1	1.1	CEI	XM	Intercity bus fares	1.3	1.172	
Taxicabs	4.7	0.1	4.6	CEI	XM	Taxi fares and limo service	2.7	0.599	
Intracity mass transit	16.5	0.2	16.3	CEI	XM	Intracity mass transit fares including transit subsidy, local transportation on out-of-town trips	10.0	0.614	
Other road transportation service	7.6	0.3	7.2	CEI	XM	Car and van pools, non-motorized transportation, automobile service clubs	2.6	0.362	
Air transportation	50.5	-34.7	85.1	CEI	XM	Airline fares	39.4	0.463	
Water transportation	2.5	-8.6	11.0	CEI	XM	Ship fares	4.8	0.431	
Communication	237.4	2.0	235.4						
Postal and delivery services	8.4	0.1	8.4						
First-class postal service (by U.S. Postal Service)	6.4	0.1	6.3	CED	XM	Postage	6.8	1.074	
Other delivery services (by non-U.S. postal facilities)	2.1	0.0	2.1	CED	XM	Delivery services	0.4	0.174	
Telephone and facsimile equipment	14.0	0.1	13.9	CED(I)	XM	Telephones and accessories, telephone answering devices, and global positioning equipment devices	4.6	0.332	
Telephone and telefax services	214.9	1.8	213.2						
Telecommunication services	161.1	1.3	159.8						
Land-line telephone services	63.0	0.5	62.5	CEI	XM	Residential telephone and pay phone service	49.6	0.794	
Cellular telephone services	98.1	0.8	97.3	CEI	XM	Cellular phone service and prepaid phone cards	93.0	0.956	
Internet access	53.8	0.4	53.4	CEI	XM	Computer information services and internet services	34.8	0.651	

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Recreation									
Video and audio equipment, computers, and related services	891.1	14.2	904.1						
Video and audio equipment	297.8	2.4	295.3						
Televisions	113.3	0.9	112.4			Televisions			
Other video equipment	37.4	0.3	37.1	CEI	XM	VCRs and video disc players, vehicle video equipment, satellite dishes, and miscellaneous video equipment	14.4	0.388	
Audio equipment	23.8	0.2	23.6	CED(I)	PM	Radios, tape recorders and players, personal digital audio players, sound components and component systems, miscellaneous sound equipment, sound equipment accessories, vehicle audio	7.9	0.333	
	19.0	0.2	18.9	CED(I)	XM		5.6	0.295	
Recording media	33.1	0.3	32.8						
Prerecorded and blank audio discs/tapes/digital files/downloads	15.8	0.1	15.7	CEI	PM	CDs, records, audio tapes, and streaming and downloading audio	2.5	0.158	
Video cassettes and discs, blank and prerecorded	17.3	0.1	17.1	CEI	PM	Video cassettes, tapes, and discs, and streaming and downloading video	3.6	0.207	
Information processing equipment	91.3	0.8	90.5						
Personal computers and peripheral equipment	47.4	0.4	47.0	CEI	PM	Computers and computer hardware, personal digital assistants, and portable memory	18.9	0.403	
Computer software and accessories	42.4	0.3	42.0	CEI	PM	Computer software and accessories	2.0	0.049	
Calculators, typewriters, and other information processing equipment	1.5	0.0	1.5	CEI	PM	Business equipment for home use	0.5	0.299	
Services related to video and audio goods and computers	93.2	0.8	92.4						
Cable and satellite television and radio services	79.5	0.7	78.9	CEI	XM	Community antenna or cable TV, satellite radio service, global positioning service, installation of satellite television equipment	77.3	0.980	
Repair of audio-visual, photographic, and information processing equipment						Repair of televisions, radio, sound equipment, rent of televisions, VCRs, radios, sound equipment, and photographic equipment; installation of televisions, sound systems, other video equipment; rental of computer and video game hardware and software	0.6	0.071	
Video media rental	5.8	0.0	5.7			Rental of video cassettes, tapes, discs, and films	2.6	0.454	
Sports and recreational goods and related services	186.1	2.1	184.0						
Sports and recreational vehicles	33.7	0.3	33.4						
Motorcycles	8.7	0.1	8.6	CEI	XM	New and used motorcycles net of sales and trade-ins	5.9	0.684	
Bicycles and accessories	4.3	0.0	4.2	CEI	XM	Bicycles	1.9	0.443	
Pleasure boats, aircraft, and other recreational vehicles	20.8	0.2	20.6						
Boats and aircraft	11.2	0.1	11.1	CEI	XM	New and used boats net of sales and trade-ins	6.8	0.609	
Other recreational vehicles	9.6	0.1	9.5	CEI	XM	New and used motor homes, campers, and trailers nets of sales and trade-ins	4.5	0.479	

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Other sporting and recreational goods	147.3	1.8	145.5						
Games, toys, and hobbies	58.6	0.8	57.8	CEI	PM	Video game hardware and software; toys, games, hobbies, and tricycles; stamp and coin collecting; online gaming	17.5	0.303	
Flowers, seeds, and potted plants	30.5	0.5	30.0	CEI	PM	Indoor plants, fresh flowers	5.9	0.196	
Sporting equipment, supplies, guns, and ammunition	53.3	0.4	52.8	CED(I)	XM	Athletic gear, game tables, exercise equipment, camping equipment, hunting and fishing equipment, winter, water, and other sports equipment, fireworks, and sports vehicles	17.6	0.333	
Musical instruments	4.9	0.0	4.9	CEI	XM	Music instruments and accessories	1.8	0.377	
Maintenance and repair of recreational vehicles and sports equipment	5.1	0.0	5.0	CEI	PM	Rental and repair of miscellaneous sports equipment	0.4	0.070	
Membership clubs, sports centers, parks, theaters, and museums (82)	136.3	2.5	133.7						
Membership clubs and participant sports centers	34.6	0.6	34.0	CEI	PM	Social, recreational, and civic club membership; docking and landing fees; fees for participant sports	28.8	0.845	
Amusement parks, campgrounds, and related recreational services	45.2	0.7	44.4	CEI	PM	Fees for recreational lessons, pinball and electronic video games, boat and trailer rental, recreational camp fees, other entertainment services	19.3	0.435	
Spectator sports (admissions)	21.4	0.4	21.0	CEI	XM	Admissions to sporting events	7.2	0.343	
Admissions to other spectator amusements	35.1	0.9	34.2	CEI	PM	Movie, theater, amusements parks, and other admissions	20.0	0.585	
Magazines, newspapers, books, and stationery	95.0	1.2	93.8						
Recreational books	30.4	0.3	30.2	CEI	XM	Books	5.6	0.185	
Magazines, newspapers, and stationery	64.6	0.9	63.7						
Newspapers and periodicals	38.7	0.5	38.1	CEI	XM	Newspapers, magazines, and newsletters	6.5	0.170	
Stationery and miscellaneous printed materials	25.9	0.4	25.5	CEI	PM	Concordance	19.1	0.748	
Gambling	72.4	4.3	68.1	CED	PM	Lotteries and pari-mutuel losses	9.5	0.100	
Pets, pet products, and related services	75.7	0.9	74.8						
Pets and related products	50.1	0.7	49.4	CEI	XM	Pet purchases and pet food, supplies, and medicines	28.4	0.575	
Veterinary and other services for pets	25.7	0.2	25.5	CEI	XM	Pet services and vet services	17.4	0.684	
Photographic goods and services	14.6	0.2	14.4						
Photographic equipment	2.8	0.0	2.8	CED(I)	XM	Photographic equipment and visual goods	3.1	1.089	
Film and photographic supplies	2.2	0.0	2.2	CED(I)	XM	Film and other photographic supplies	0.2	0.097	
Photo processing	2.4	0.0	2.4	CEI	XM	Film processing	1.4	0.584	
Photo studios	7.1	0.1	7.0	CEI	XM	Photographer fees	2.5	0.359	
Package holidays	13.4	0.6	12.7	CEI	I	Lodging while out of town	.....	.....

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010								
Label	NIPA Values			Indicators/Matches				
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value
Education	249.3	1.9	247.4					
Educational books	13.3	0.1	13.2	CEI	PM	School books, supplies, and equipment for college	7.7	0.584
Post-secondary education	194.5	1.6	192.9					
Government educational assistance for post-secondary education	74.4	0.9	73.5					
Education assistance	66.4	0.8	65.6	CPS	PM	Education assistance, total value government	16.7	0.255
Veterans readjustment (education & training)	8.0	0.1	7.9	CPS	PM	Veterans payments for education & other	2.7	0.349
Other payments for post-secondary education	120.1	0.7	119.5	CEI	PM	College tuition, vocational and technical school tuition, and other school tuition	88.5	0.740
Nursery, elementary, and secondary schools	41.4	0.2	41.2					
Elementary and secondary schools	31.6	0.2	31.5	CEI	PM	Elementary and high school tuition	18.9	0.600
Day care and nursery schools	9.8	0.0	9.7	CEI	I	Elementary and high school tuition	.....	.....
Food services and accommodations	638.0	27.4	610.6					
Food services	547.4	15.4	532.0					
Purchased meals and beverages (102)	533.1	13.5	519.6					
Meals and nonalcoholic beverages	463.1	11.7	451.4					
Meals at schools	24.9	0.2	24.7					
Elementary and secondary school lunches	7.5	0.1	7.4	CED	PM	Meals and snacks at employer and school cafeterias	13.1	1.769
Higher education meals	17.4	0.1	17.3	CEI	PM	Board, including at school	4.7	0.273
Other purchased meals	438.2	11.5	426.7	CED(I)	XM	Meals, snacks, and catered affairs	275.6	0.646
Alcohol in purchased meals	70.0	1.8	68.1	CED(I)	XM	Beer, wine, and other alcoholic beverages at meals and snacks	23.0	0.338
Food furnished to employees (including military) (103)	14.3	1.9	12.4					
Food supplied to civilians	12.5	0.1	12.4	CEI	XM	Meals as pay	3.3	0.268
Food supplied to military	1.8	1.8	0.0	.....	.....	.....	.....	.....
Accommodations	90.6	12.0	78.7					
Hotels and motels	66.8	11.8	55.1	CEI	XM	Lodging while out of town and vacation clubs	36.9	0.670
Housing at schools	23.8	0.2	23.6	CEI	PM	Housing while attending school	6.8	0.289

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Financial services and insurance	592.5	3.8	776.5						
Financial services	514.5	2.5	512.0						
Financial services furnished without payment	287.9	1.4	286.5						
Commercial banks	114.2	0.6	113.7	CEI	I	Market value of checking accounts		.....	.....
Other depository institutions and regulated investment companies	135.7	0.7	135.1	CEI	I	Market value of savings accounts and all securities		.....	.....
Pension funds	38.0	0.2	37.8	CPS	I	Wages and salaries value of those participating in employer-sponsored pension plans.		.....	.....
Financial service charges, fees, and commissions	226.6	1.1	225.5						
Financial service charges and fees	87.6	0.4	87.2	CEI	PM	Checking accounts, other bank services, safe deposit box rental, credit card membership, and finance charges excluding mortgages and vehicles	9.0	0.103	
Securities commissions	37.8	0.2	37.6	CEI	I	Purchase price of stocks, bonds or mutual funds including broker fees, sale price of stocks, bonds, and mutual funds, net	.....	.....	.....
Portfolio management, investment advice, trust, fiduciary, and custody activities	101.2	0.5	100.7	CEI	I	Market value of all securities	.....	.....	.....
Insurance	265.8	1.3	264.5						
Life insurance	78.1	0.4	77.7	CEI	I	Life, endowment, annuity, other personal insurance	.....	.....	.....
Net household insurance (111)	7.7	0.0	7.6						
Net tenants' insurance	0.6	0.0	0.6	CEI	I	Tenant's insurance	.....	.....	.....
Net homeowners' insurance on household contents	7.1	0.0	7.1	CEI	I	Homeowners insurance	.....	.....	.....
Net health insurance (112)	119.9	0.6	119.3						
Medical care and hospitalization	100.3	0.5	99.8						
Employer paid	41.5	0.3	41.2	CPS	I	Employer contribution for health insurance	.....	.....	.....
Employee and self-paid	22.8	0.2	22.7	CEI	I	Health insurance	.....	.....	.....
Medicare, Medicaid, and other state and local medical care	35.9	0.0	35.9						
Medicare	23.4	0.0	23.4	CPS	I	Person market value of Medicare	.....	.....	.....
Medicaid	11.8	0.0	11.8	CPS	I	Person market value of Medicaid	.....	.....	.....
Other state and local medical care	0.7	0.0	0.7	CPS	I	Allocated to each child covered by CHIP program	.....	.....	.....
Income loss	2.7	0.0	2.7	CPS	I	Wages and salaries value	.....	.....	.....
Workers' compensation	16.9	0.1	16.9	CPS	I	Private employee wages and salaries	.....	.....	.....
Net motor vehicle and other transportation insurance (116)	60.1	0.3	59.8	CEI	I	Auto insurance, auto repair service policy	.....	.....	.....

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Other goods and services	692.5	17.9	674.6						
Personal care	191.1	2.2	188.9						
Personal care products (part of 118)	95.2	1.4	93.9						
Hair, dental, shaving, and miscellaneous personal care products except electrical products									
	48.7	0.7	48.0	CED(I)	PM	Hair care products, non-electric articles for the hair, wigs and hairpieces, oral hygiene products and articles, shaving needs, deodorants, feminine hygiene, miscellaneous personal care, infants' equipment	21.3	0.444	
Cosmetic/perfumes/bath/nail preparations and implements	41.4	0.6	40.8	CED	PM	Cosmetics, perfumes, bath preparations	16.2	0.398	
Electric appliances for personal care	5.2	0.1	5.1	CED	XM	Electric personal care appliances	1.3	0.263	
Personal care services	95.9	0.8	95.1						
Hairdressing salons and personal grooming establishments	52.3	0.4	51.9	CEI	XM	Personal care services	33.6	0.647	
Miscellaneous personal care services	43.5	0.4	43.2	CED(I)	PM	Watch and jewelry repair, repair of personal care appliances, shopping club membership fees, dating services, miscellaneous personal services	12.6	0.292	
Personal items	89.6	0.7	88.9						
Jewelry and watches	61.5	0.5	61.0						
Jewelry	53.4	0.4	52.9	CEI	XM	Jewelry	11.7	0.221	
Watches	8.1	0.1	8.1	CEI	XM	Watches	2.6	0.327	
Luggage and similar personal items	28.1	0.2	27.9	CED(I)	PM	Luggage and women's, men's, girls' and boys' accessories	13.3	0.478	
Social services and religious activities	154.1	13.0	141.2						
Child care	30.3	0.1	30.2	CEI	PM	Day care, nursery school, preschool expenses including tuition, babysitting and child care in own home, babysitting and child care in someone else's home	38.5	1.277	
Social assistance	101.4	12.7	88.7						
Medicare, Medicaid, and other state and local medical care	55.2	12.3	42.9						
Medicare	1.3	0.3	1.0	CPS	I	Person market value of Medicare			
Medicaid	52.9	11.8	41.1	CPS	I	Person market value of Medicaid			
Other state and local medical care	1.0	0.2	0.8	CPS	I	Allocated to each child covered by CHIP program			
Out-of-pocket and other expenditures for social assistance	0.0	0.4	45.8	.....	E	.....	.....	.....
Social advocacy and civic and social organizations	15.7	0.1	15.6	.....	E	.....	.....	.....
Religious organizations' services to households	6.1	0.0	6.0	.....	E	.....	.....	.....
Foundations and grantmaking and giving services to households	0.6	0.0	0.6	.....	E	.....	.....	.....

Appendix Table 2 NIPA Household Consumption Expenditures and Micro Matches & Indicators, 2010									
Label	NIPA Values			Indicators/Matches					
	Published	Less: Coverage Adjustment	Equals: Scope-Adjusted Values	Source	Type	Series	Value	Ratio to Adjusted NIPA Value	
Professional and other services	163.3	0.8	162.5						
Legal services	96.8	0.5	96.3	CEI	PM	Legal fees	15.6	0.162	
Accounting and other business services	27.7	0.1	27.6						
Tax preparation and other related services	21.8	0.1	21.7	CEI	PM	Accounting fees	7.9	0.366	
Employment agency services	0.8	0.0	0.8	CPS	I	Wages and salaries value	.....	.....
Other personal business services	5.1	0.0	5.1	CED	PM	Miscellaneous personal services	11.1	2.176	
Labor organization dues	11.9	0.1	11.8	CPS	I	Member of labor union/employee association	.....	.....
Professional association dues	7.9	0.0	7.8	CPS	I	Wages and salaries value	.....	.....
Funeral and burial services	19.0	0.1	19.0	CEI	XM	Funeral expenses; cemetery lots, vaults, and maintenance fees	11.4	0.604	
Tobacco	94.4	1.3	93.1	CED(I)	PM	Cigarettes, other tobacco products, smoking accessories	43.8	0.471	
Net foreign travel and expenditures abroad by U.S. residents	0.0	-16.3	0.0						
Foreign travel by U.S. residents	0.0	115.4	0.0	.....	.....	.....	.....	.....
Less: Expenditures in the United States by nonresidents	0.0	138.2	0.0	.....	.....	.....	.....	.....
Net expenditures abroad by U.S. residents	0.0	6.5	0.0	.....	.....	.....	.....	.....
Note: Matches may have been made at a more detailed level than shown in the table									
CED Consumer Expenditure Diary Survey									
CEI Consumer Expenditure Interview Survey									
CED(I) Consumer Expenditure Diary and Interview Survey									
CPS Current Population Survey Annual and Economic Supplement									
XM Exact match									
PM Partial match									
I Indicator									
E Evenly distributed to all households									

Technical Appendix A: Synthetic Data - Unconstrained Statistical Matching

For this study, statistical matching was necessary because neither the CPS-ASEC source nor CE contained all the information necessary for the analysis, either for income or for consumption. To overcome this problem, a synthetic data set was constructed using a statistical matching procedure which linked household units in the Current Population Survey (CPS) to units in the Consumer Expenditure Survey (CE) through the use of “common” variables that exist in both surveys. The synthetic data generated, as a result, contained all income components necessary to construct disposable household income and household outlays at the household level.

In total, twenty “common” variables were identified in the CPS and the CE. These variables were used in the unconstrained statistical matching procedure to link the two surveys.

Common Income Variables:

1. Wages and Salary
2. Nonfarm Income
3. Farm Income
4. Social Security and Railroad Retirement Benefits
5. Supplemental Security Income
6. Unemployment Compensation
7. Workers' Compensation
8. Welfare
9. Pension
10. Alimony Received
11. Child Support Received
12. Food Stamps

Common Demographic Variables:

1. Household Size
2. Number of Kids
3. Number of Persons Older than 65
4. Marital Status of Reference person
5. Education Level of Reference Person
6. Household Located in an MSA with a Population Greater than 1 million
7. Race of Reference Person
8. Housing Tenure (rent, own, etc.)

Statistical matching first began to be widely used in the early 1970s through the work of Budd (1971), Okner (1972), Ruggles and Ruggles (1974), Radner (1981), Barr and Turner (1981), Rodgers and DeVol (1984), Rubin (1986) and more recently by Kadane (2001), D’Orazio et al. (2001), Moriarity and Scheuren (2001 and 2003), and Denk and Hackl (2003). Although statistical matching has been around for over forty years, there is no single best approach and continues to be an area of research. Currently, statistical matching methodologies fall under three general categories: unconstrained, constrained, and multiple imputations. Each approach has trade-offs and is therefore up to the researcher to determine which is best in regards to their application.

Unconstrained matching has the advantage of being relatively easy to implement and is guaranteed to find the best match based on a distance metric that compares a common set of variables across two (or more) data sources. It is called unconstrained because there is no limit on the number times a unit can be used in the matching process. As a result, it is possible for the same CE unit to be used multiple times, or, it is also possible for a CE unit to not be used at all. Therefore, the marginal distribution for each component is not guaranteed to be preserved which also happens to be one of the major criticisms of this approach. For example, in the original CE the average rental value of owner-occupied dwellings is \$16,184 whereas in the synthetic data generated from an unconstrained match the average is \$16,650.5. Although the difference is small, a constrained match would produce synthetic data with exactly the same average (as well as the same standard deviation). This is because constrained statistical matches require every unit to be used in the matching process, hence the “constraint.” From a macro perspective, the preservation of the marginal distributions is an appealing feature as it prevents the data from being biased. However, at the micro level, constrained statistical matches offer no guarantee that a household will be matched to the household with the smallest possible distance (i.e. best match). This is because the “constraint” condition *must* be satisfied which may or may not hinder the distance function from finding the best match. Constrained statistical matches also have the caveat of being computationally demanding requiring a significant amount of time to solve.¹

Due to time constraints, an unconstrained statistical match was used to link the CPS to the CE as it is, in general, regarded as the easiest method to implement. The basic idea behind an unconstrained match is to find a set of “common” variables that exist in both the CPS and CE that can be used to measure how “similar” two units are from the two samples. In our application, we found twenty variables that were deemed compatible. These include twelve

¹ To put things in perspective, the unconstrained match took just under an hour to run. Essentially, this required matching 75,188 CPS units to 32,188 CE units which translates into over 2.4 billion comparisons. Presumably, a constrained match would take substantially longer to run – perhaps several days.

income variables (e.g. wages and salary, pension plan income, alimony received, etc.) and eight demographic variables (e.g. household size, number of kids, education, etc.). A distance function was then defined measuring how similar *each* unit in the CPS was to *all* units in the CE. The CE unit with the smallest distance was then chosen as the best match. This was repeated for all CPS units.

When defining the distance function, special care was needed when deciding how much weight/importance to assign to each common variable. For example, should wages and salary be equally as important as household size? Furthermore, how do you measure the distance between two categorical variables? The unconstrained matching algorithm developed for this application used several steps to mitigate these concerns. To help the reader understand this process, these steps have been visually laid out below using hypothetical data:

Step 1: Basic set up before match:

CPS Unit	Common Variables								Unique CPS Variables
	Household Size	Number of Kids	Number of people older than 65	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support	
1	4	2	0	50,000	0	0	0	0	ZZZZ_1

CE Unit	Common Variables								Unique CE Variables
	Household Size	Number of Kids	Number of people older than 65	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support	
1	2	1	0	0	10,000	0	500	0	YYYYY_1
2	3	2	0	30,000	0	0	0	5,000	YYYYY_2
3	4	2	0	40,000	0	0	0	0	YYYYY_3
4	4	2	0	0	15,000	0	800	0	YYYYY_4
5	5	2	1	80,000	0	0	0	0	YYYYY_5
6	4	2	0	90,000	0	0	0	0	YYYYY_6
7	1	0	1	0	0	0	0	0	YYYYY_7
8	4	2	0	100,000	0	0	0	0	YYYYY_8

Step 2: Calculate the distance between demographic variables only. Keep only those CE units with a distance of zero (i.e. an exact demographical match):

	Household Size Distance	Number of Kids Distance	Number of People older than 65 Distance	Total Distance
CPS – CE_1	(4-2)=2	(2-1)=1	(0-0)=0	3
CPS – CE_2	(4-3)=1	(2-2)=0	(0-0)=0	1
CPS – CE_3	(4-4)=0	(2-2)=0	(0-0)=0	0
CPS – CE_4	(4-4)=0	(2-2)=0	(0-0)=0	0
CPS – CE_5	(4-5)=1	(2-2)=0	(0-1)=1	2
CPS – CE_6	(4-4)=0	(2-2)=0	(0-0)=0	0

CPS – CE_7	(4-1)=3	(2-0)=2	(0-1)=1	6
CPS – CE_8	(4-4)=0	(2-2)=0	(0-0)=0	0

CE Units with a demographic distance of zero:

CE Unit	Common Variables								Unique CE Variables
	Household Size	Number of Kids	Number of people older than 65	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support	
3	4	2	0	40,000	0	0	0	0	YYYYY_3
4	4	2	0	0	15,000	0	800	0	YYYYY_4
6	4	2	0	90,000	0	0	0	0	YYYYY_6
8	4	2	0	100,000	0	0	0	0	YYYYY_8

Step 3: Construct a temporary CPS and CE data set that uses indicator variables, rather than actual values, for incomes. Calculate the distance between the income indicator variables. Keep only those CE units with a distance of zero.

CPS Income Indicator:

CPS Unit	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support
1	1	0	0	0	0

CE Income Indicator:

CE Unit	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support
3	1	0	0	0	0
4	0	1	0	1	0
6	1	0	0	0	0
8	1	0	0	0	0

Income Indicator Difference:

	Wage & Salary Distance	Unemployment Distance	Welfare Distance	Food Stamp Distance	Child Support Distance	Total Distance
CPS – CE_3	(1-1)=0	(0-0)=0	(0-0)=0	(0-0)=0	(0-0)=0	0
CPS – CE_4	(1-0)=1	(0-1)=1	(0-0)=0	(0-1)=1	(0-0)=0	3
CPS – CE_6	(1-1)=0	(0-0)=0	(0-0)=0	(0-0)=0	(0-0)=0	0
CPS – CE_8	(1-1)=0	(0-0)=0	(0-0)=0	(0-0)=0	(0-0)=0	0

CE Units with a difference of zero:

CE Unit	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support	Unique CE Variables
3	40,000	0	0	0	0	YYYYYY_3
6	90,000	0	0	0	0	YYYYYY_6
8	100,000	0	0	0	0	YYYYYY_8

Step 4: Measure the actual difference in income values (i.e. the distance) between all remaining CE units

Distance (CPS – CE_3) = (50,000 – 40,000) = 10,000 ***

Distance (CPS – CE_6) = (50,000 – 90,000) = 40,000

Distance (CPS – CE_8) = (50,000 – 100,000) = 50,000

Step 5: Link the CE unit with the smallest distance (CE unit #3) to the CPS unit of interest. The result is a synthetic data set.

Synthetic Data Set:

CPS Unit	Household Size	Number of Kids	Number of people older than 65	Wage & Salary	Unemployment Comp	Welfare	Food Stamps	Child Support	Unique CPS Variables	Unique CE Variables
1	4	2	0	50,000	0	0	0	0	ZZZZ_1	YYYY_3

There are several exceptions to the steps above. First, it may be possible that no CE unit(s) exist with the same demographics as the CPS unit of interest (i.e. demographic distance > 0). This typically occurs for housing units with “extreme” demographics. For example, if the CPS unit of interest has a household size of 10, has 5 kids, and has 3 people older than 65, then it is very possible that no such housing unit exists in the CE. In this case, the matching algorithm looks for all CE units with a demographic difference of 1 (rather than zero). If there are no CE units with a demographic distance of 1, then the matching algorithm looks for all CE units with a demographic distance of 2. This continues until the matching algorithm finds the CE unit with the “closest” demographic type.

It is also possible that no CE unit(s) exist with the same sources of income as the CPS unit of interest (see step 3 above). In this case, the matching algorithm looks for all those CE units where the income indicator difference is 1 (rather than 0). Again, as with the

demographical differences described above, this process continues until the algorithm finds the CE unit with the “closest” sources of income. Finally, steps 4 and 5 are conducted as normal.

Overall, the unconstrained statistical matching algorithm performed well. Attached to this document are several summary statistics that compare the marginal distributions of both the synthetic and original data for each of the 24 unique CE income variables that were needed to construct Personal Income. Although there is no formal way to measure the accuracy of a statistical match, the following criteria can be used to determine how well the match performed:

- 1) Compare the weighted population size (not sample sizes)
- 2) Compare the averages and medians²
- 3) Compare all other percentiles of the distributions

If the weighted population sizes are similar, then this suggests that the correct number of CE units were “pulled” during the matching process. The last two criteria are simply used to examine how similar the marginal distributions of the synthetic data are to the original.

References

Australian Bureau of Statistics: Methodology Advisory Committee. 2004. “Statistical Matching of the HES and NHS: An Exploration of Issues in the Use of Unconstrained and Constrained Approaches in Creating a Basefile for a Microsimulation Model of the Pharmaceutical Benefits Scheme.”

Bar, R. S. and S. J. Turner. 1981. “Microdata File Merging Through Large-Scale Network Technology.” *Mathematical Programming Study* 15: 1-22.

Budd, E. C. 1971. “The Creation of a Microdata File for Estimating the Size Distribution of Income.” *Review of Income and Wealth* 17: 317-333.

D’Orazio, M., M. Di Zio, and M. Scanu. 2001. “Statistical Matching: A Tool for Integrating Data in National Statistical Institutes.” *Proceedings of the Joint ETK and NTTS Conference for Official Statistics*. Crete.

Denk, M. and P. Hackl. 2003. “Data integration and Record Matching: An Austrian Contribution to Research in Official Statistics.” *Austrian Journal of Statistics* 32: 305:321.

² Medians may be a better metric for cases in which extreme observations were excluded from the synthetic data as it may skew the average.

Kadane, J. B. 2001. "Some Statistical Problems in Merging Data Files." *Journal of Official Statistics* 17: 423-433.

Moriarity, C. and F. Scheuren. 2001. "Statistical Matching: A Paradigm for Assessing the Uncertainty in the Procedure." *Journal of Official Statistics* 17: 407-422.

----- and -----, 2003. "A Note on Rubin's Statistical Matching Using File Concatenation with Adjusted Weights and Multiple Imputations." *Journal of Business and Economic Statistics* 21: 65 – 73.

Okner, B. A. 1972. "Constructing a New Data Base from Existing Microdata Sets: The 1966 MERGE File." *Annals of Economic and Social Measurement* 1: 1972.

Radner, D. B. 1981. "An Example of the use of Statistical Matching in the Estimation and Analysis of the Size Distribution of Income." *The Review of Income and Wealth* 27: 211-242.

Rodgers, W. L. 1984. "An Evaluation of Statistical Matching." *Journal of Business and Economic Statistics* 2: 91-102.

Rubin, D. B. 1986. "Statistical Matching Using File Concatenation with Adjusted Weights and Multiple Imputations." *Journal of Business and Economic Statistics* 4: 87-94.

Ruggles, N. and R. Ruggles. 1974. "A Strategy for Merging and Matching Microdata Sets." *Annals of Economic and Social Measurement* 3: 353-371.