

ESI ECONOMIC SECURITY INDEX

The Economic Security Index

A NEW MEASURE OF THE ECONOMIC SECURITY
OF AMERICAN WORKERS AND THEIR FAMILIES

Technical Report
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The Economic Security Index (ESI), developed by political scientist Jacob Hacker and a multi-disciplinary research team with support from the Rockefeller Foundation, is designed to provide a meaningful, succinct measure of Americans' economic security. Professor Hacker is based at the Institution for Social and Policy Studies at Yale University, which aims to facilitate interdisciplinary inquiry in the social sciences and research into important public policy arenas.

The ESI is part of the "Campaign for American Workers" initiative of the Rockefeller Foundation. The initiative strives to improve economic security among American workers and their families, in part by improving knowledge and understanding among policymakers and thought leaders of the dimensions of American economic security.

The ESI research team has been guided by a technical committee retained by the Rockefeller Foundation to provide oversight and to reinforce the intellectual and analytical integrity of the resulting work. Chaired by Brookings Institution economist Henry Aaron, the technical committee is comprised of seven leading experts on economic security:

- Henry Aaron (BROOKINGS INSTITUTION)
- Gary Burtless (BROOKINGS INSTITUTION)
- Henry Farber (PRINCETON UNIVERSITY)
- Robert Greenstein (PRESIDENT, CENTER ON BUDGET AND POLICY PRIORITIES)
- Larry Mishel (DIRECTOR, ECONOMIC POLICY INSTITUTE)
- Alicia Munnell (DIRECTOR, BOSTON COLLEGE CENTER ON RETIREMENT RESEARCH)
- Robert Solow (NOBEL PRIZE IN ECONOMICS, 1987)

Introduction

The Economic Security Index (ESI) is a new measure of economic security designed to foster research and policy analysis. Based on a simple definition of economic security and grounded in panel data that tracks individuals' economic circumstances over time, the ESI provides a new perspective on the dimensions, distribution, and evolution of American economic security.

This report focuses on the technical aspects of the ESI's construction and the issues that the ESI raises for research and theory. A companion report, "Economic Security at Risk," provides a broad overview of the definition and basic features of the ESI, along with a more detailed rendering of the initial findings.

The ESI contributes to a burgeoning national conversation about economic security in four primary ways:

- 1** It offers a simple definition of one major element of security—the degree to which individuals are subject to large short-term economic losses without adequate financial protection.
- 2** It shows how this concept of economic security can be assessed using panel data on individual economic experiences, rather than public opinion data on individuals' perceptions of those experiences.
- 3** It represents the first attempt to incorporate several key influences on economic security into a single unified measure without aggregating a series of disparate indicators. The three key determinants of economic security it focuses on are (a) large losses in household income, (b) large spikes in household medical spending, and (c) the adequacy of household financial wealth to buffer these losses and spikes.
- 4** The investigations that undergird the ESI provide new empirical analyses of the varied exposure of different groups of Americans to risky economic circumstances—insights that are of value apart from their use in constructing the ESI.

The structure of this report mirrors the construction of the ESI. Part I takes up the conceptual foundations of economic security. Parts II, III, and IV discuss the data and design considerations involved in analyzing the three major components of the ESI: income losses, medical spending dynamics, and wealth holdings. Part V concludes by outlining some of the main empirical and theoretical issues that the ESI raises for future research.

I. Assessing Economic Security

The ESI is an annual index that represents the share of Americans who experience at least a 25 percent decline in their inflation-adjusted “available household income” from one year to the next and who lack an adequate financial safety net to replace this lost income until it returns to its original level. “Available household income” is income that is reduced by the amount of a household’s out-of-pocket medical spending and adjusted to reflect household size, household debt burdens, and, for older Americans, household retirement assets. An “adequate” financial safety net is defined as sufficient financial wealth to offset an individual’s income loss for as long as it takes the typical person to recover from a loss of comparable magnitude. An individual who has an adequate financial safety net is not counted as insecure in the ESI even if that individual experiences a 25 percent or greater decline in available household income. In addition, those entering retirement are excluded from the count of the insecure. This exclusion reflects a judgment that retirement is different from other large economic losses in that it can generally be anticipated, is typically voluntary, and is usually expected to produce some drop in income (in part because expenses fall when workers exit the labor force). Once individuals are retired, however, they are counted as insecure when they experience 25 percent or greater income declines.

Formally, the ESI can be defined as follows. Focusing first on identifying individuals i who are classified as insecure in year t , the indicator of insecurity r_{it} is

$$r_{it} = \begin{cases} 1 & \text{if } \left[\left(\frac{(Y_t - M_t - D_t)/e_t}{(Y_{t-1} - M_{t-1} - D_{t-1})/e_{t-1}} - 1 \right) \leq -0.25 \right], W < W^*, \text{ and } R_{t-1} = R_t \\ 0 & \text{otherwise} \end{cases}$$

where

Y = total household income (includes annuitized defined-contribution retirement wealth if head age ≥ 60)

M = total household medical out of pocket expenditures

D = household debt service (>0 if household liquid financial wealth <0)

e = household equivalence scale: $(0.7^* \text{children} + \text{adults})^{0.7}$

W = household liquid financial wealth, averaged over panel

W^* = average cumulative Y loss over six years (based on median recovery paths for typical individual with similar characteristics)

R = dummy equaling 1 if retired

With r_{it} taking the value 1 (loss) or 0 (no loss) for each individual, the value of the ESI in year t is the weighted sum of the indicator values for the sample

$$ESI_t = \sum_{i=1}^{N_t} \frac{w_{it} r_{it}}{w_{it}}$$

where

N_t = sample size in t and $(t-1)$

w_{it} = sampling weights

The primary data source used to calculate the ESI is the Survey of Income and Program Participation (SIPP) conducted by the U.S. Census Bureau. The ESI also draws on additional sources, including the Consumer Expenditure Survey (CEX) of the Bureau of Labor Statistics, also conducted by the Census Bureau; the Panel Study of Income Dynamics (PSID), conducted by the University of Michigan Survey Research Center; and a unique survey of Americans' economic experiences and perceptions conducted as part of the American National Elections Studies (ANES) Panel Study in 2008 and 2009.

The ESI is available, in its most complete form, for the period 1985 through 2007. To provide a more extended perspective on Americans' changing economic security, we also provide projections based on historical trends from 1985-2007 for the period 2008-2009, validated using the ANES data from 2008 and 2009. In addition, a less complete version of the ESI focusing just on income losses is available using the PSID, dating back to the late 1960s.

RATIONALE FOR THE ESI

The basis for concern about economic security is the belief that uncertain economic prospects leave people worse off. This belief has two logical foundations: that individuals fear large economic losses, and that when individuals experience such losses, they suffer hardship. A growing body of research has investigated both foundations.¹ This research suggests that economic insecurity is rooted in basic features of human cognition and economic markets, especially the fundamental behavioral trait known as “loss aversion” (the tendency for individuals to be more sensitive to reductions in their economic standing than to increases), the difficulties and biases people face when assessing relevant economic contingencies, and the incomplete character of many private markets for insuring against those contingencies.²

Most of this research adopts a common, though often implicit, definition of economic security: *the degree to which individuals are protected against hardship-causing economic losses*. Yet there is much less agreement on how to translate this general definition into specific domains, or on how to measure the actual extent of protection that people enjoy.³ The ESI responds to many of these concerns while integrating key findings of existing research. In particular, the ESI extends a recent wave of research on family income instability, sometimes referred to as “income volatility.” However, the ESI incorporates a broader set of influences on family economic well-being than income fluctuations alone, and it is designed to respond to a number of sensible critiques of research on income instability.

At the same time, the ESI is constructed to be a simple, consistent measure that is simultaneously easy to understand and sophisticated enough to provide a founda-

tion for further research. Based on the best available data and carefully designed to avoid overstating the degree of economic insecurity, the ESI is the first integrated measure of American economic security available for an extended time span.

COMPONENTS OF THE ESI

The ESI provides a picture of three of the most essential features of Americans' economic circumstances: (1) the probability of large household income declines, (2) the possibility of large medical spending shocks, and (3) the capacity of households to buffer these economic events by spending down liquid financial wealth.⁴

The core focus of the ESI is large drops in available income, defined as a one-quarter (25 percent) or greater year-to-year decline in available household income. For both simplicity of exposition and because a percentage loss measure is inherently scaled to income, the 25 percent threshold does not vary with household income or other individual or household characteristics.⁵

Substantial evidence suggests that the median American household would have considerable difficulty making ends meet if it experienced an income loss of 25 percent or larger from one year to the next. As part of the development of the ESI, the Rockefeller Foundation funded a parallel research effort to assess Americans' perceptions of economic security using a new set of opinion polls embedded in the American National Election Studies (ANES). Although the ANES findings are not directly incorporated into the ESI—which is based entirely on panel economic data—they inform elements of its design and provide a means of validating ESI projections that were done for the years 2008 and 2009. The ANES findings indicate that the 25 percent threshold is a very reasonable standard. When asked how long their household could go without its current income before experiencing hardship, just under half of respondents to the ANES survey indicated that their household could go two months or less. The loss of three months of income (that is, 25 percent of annual income) would therefore be expected to cause hardship for at least half of Americans.

However, while income drops have a direct relation to economic security, they are not synonymous with it, for several reasons. First, shocks induced by nondiscretionary spending obligations can also pose substantial threats to economic security that are not captured by fluctuations in income alone.⁶ Perhaps the most important of these nondiscretionary expenses is medical care. Fifteen years ago, the National Academy of Sciences (NAS) recommended that the burden of out-of-pocket medical expenses should be incorporated into the determination of poverty status, because medical spending reduces income available for other purposes.⁷ The ESI incorporates this recommendation in its assessment of the economic security of all Americans by reducing individuals' available household

income by the amount of their out-of-pocket medical spending (including insurance premiums paid directly by consumers, rather than by employers). As a result, the ESI's measure of available household income may drop not only because of declines in earnings or other income, but also due to increases in out-of-pocket medical spending.

Second, the extent to which drops in earnings or increases in medical spending are associated with hardship depends on household characteristics and the availability of public and private transfers, among other factors. Households that have multiple earners have the capacity to buffer reductions in earnings or increased nondiscretionary needs for one household member through compensatory responses by other members of the household, such as an increase in hours worked.⁸ Similarly, access to public transfers (such as unemployment insurance) or private transfers (such as gifts from relatives) can offset earnings declines, reducing the effect of those declines on income.

The ESI incorporates these buffers in two ways: (1) by adopting as broad as possible a definition of income and (2) by focusing on individuals' *household* income, adjusted for household size. In other words, its measure of income includes not just earnings but also public and private transfers, and that measure includes not just an individuals' income but also income from other household members.

Briefly, the measure of income used for the ESI includes earned income, property and asset income, cash transfer payments (including private transfers, such as gifts), private pension payments, unemployment benefits, lump-sum and one-time payments, and regular salary or other income from a self-owned business. In addition, the ESI definition of available family income includes the annuitized value of defined-contribution retirement accounts when individuals are aged 60 or over. Available family income is also reduced by the cost of debt-service for families with negative financial wealth holdings.⁹ Income is aggregated at the household level and adjusted for family size using the NAS-recommended equivalence scale for the poverty line.¹⁰

Finally, the impact of economic fluctuations depends in part on the extent to which these changes can be anticipated and adapted to before their occurrence.¹¹ Even substantial drops in income may not result in material hardship if a household has sufficient precautionary saving to buffer the decline.¹² For this reason, the ESI does not count as insecure individuals who have saved enough to replace income lost due to a fall in income or spike in medical costs.

Defining sufficient precautionary saving—the “adequate financial safety net” of the definition that opened this section—has two aspects. The first is deciding what constitutes precautionary saving. The ESI focuses on “liquid financial wealth,”

that is, wealth that can be easily liquidated to replace lost income. In practice, this is all wealth holdings besides the primary home, personal vehicles, and earmarked retirement savings.

The second aspect of judging the sufficiency of precautionary saving is determining what level of wealth holdings is sufficient to buffer income losses. The ESI defines an “adequate financial safety net” as liquid financial wealth sufficient to replace lost income for the typical duration and magnitude of loss experienced prior to a return to pre-drop income. Thus, individuals who experience a 25 percent or greater household income loss are not counted as “insecure” if they have liquid financial wealth equal to or greater than the cumulative loss for a typical individual sharing their sociodemographic characteristics who experiences a loss of comparable magnitude.

Related, retirement is an economic transition for which declines in income are expected and to some extent matched by declines in nondiscretionary spending.¹³ For this reason those entering retirement are excluded from the count of the insecure even if available household income declines by 25 percent or more concurrent with entering retirement. Once individuals are retired, however, they are counted as insecure when their income declines by 25 percent or more if they lack an adequate financial safety net. It should be noted that this retirement-entry exclusion affects the level of, and trend in, the index only to a very small degree.

THE ESI FINDINGS IN BRIEF

The companion public report and website (www.economicsecurityindex.org) provide a detailed presentation of the results. Before delving into the empirical foundations of the ESI, however, it is helpful to examine the basic series. Figure 1 shows that the ESI has increased over the 25-year period for which complete calculations of the index are possible (1985-2007). Moreover, in Figure 1, the ESI is projected forward to 2008-2009 based on the prior relationship between the ESI and aggregate measures of national economic performance. These projections suggest that in 2009 the level of economic insecurity experienced by Americans was greater than at any time over the past quarter century, with approximately one in five Americans (20.4 percent) experiencing a decline in available household income of 25 percent or greater. This projection is remarkably consistent with the reported prevalence of 25 percent or greater income losses in the ANES survey of Americans’ economic experiences that was conducted in conjunction with the development of the ESI.¹⁴

Because the level of economic security fluctuates with the general health of the economy, a particularly reliable way of judging trends in the ESI is to compare the ESI across “peaks” (or “troughs”) in the business cycle. As the figure makes clear,

FIGURE 1

The ESI: Americans Experiencing Major Economic Losses, 1985-2007

(with 2008-09 Projections)

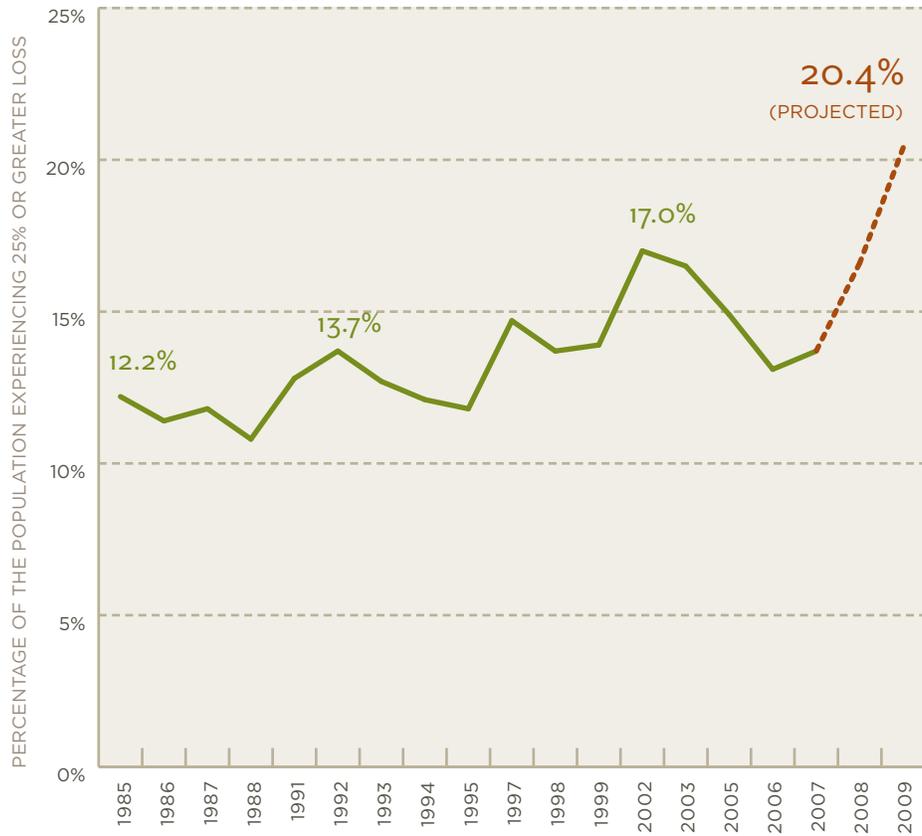
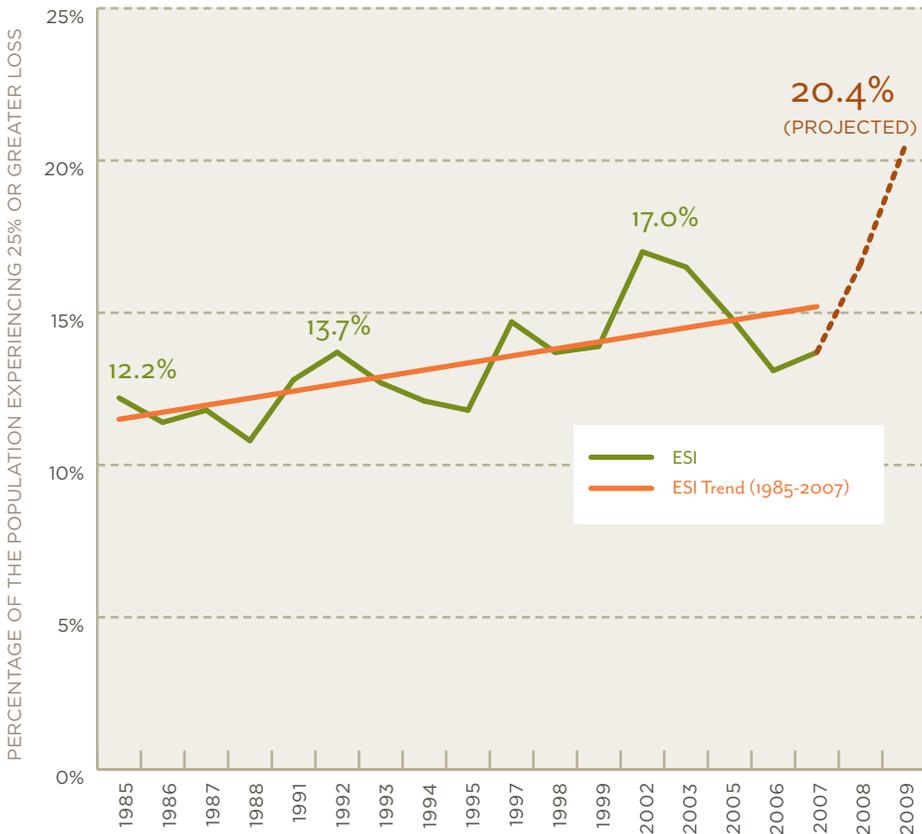


FIGURE 2

The ESI: The Long-Term Upward Trend, 1985-2007 (with 2008-09 Projections)



the ESI has risen across economic downturns: It was higher in 2001 than in 1991, and according to the projections, higher in 2009 than in 2001.

Statistically, the overall trend in the level of the ESI can be precisely calculated. In Figure 2, this annual trend line for the 1985-2007 period (that is, without the projected 2008 and 2009 estimates) is superimposed over the results presented in Figure 1. This trend line shows that the share of Americans defined as insecure has increased by approximately 3.7 percentage points over the 1985-2007 period, or proportionally by nearly a third (31.8 percent). If the projections for 2008 and 2009 are included, the ESI increased by approximately 5.5 points, or proportionally by approximately half (49.9 percent) since 1985.

Another way to see the long-term trend is to examine the relationship between the ESI and the unemployment rate (see Table 1). In 1985, the unemployment rate was 7.2 percent and the ESI was 12.2 percent. The 1992 unemployment rate was about the same, but the ESI was 1.5 percentage points higher—at 13.7 percent. By 2002, unemployment had fallen to 5.8 percent, but the ESI was at 17 percent. In other words, the ESI has been higher relative to unemployment in recent years than it was in the 1980s. At any given unemployment rate (or poverty rate, as shown in Table 1), more people are experiencing insecurity than in the past.¹⁵

TABLE 1

ESI vs. the Unemployment and Poverty Rates, 1985-2009

	1985	1992	2002	2007	2009	1985-1995	1997-2007
Unemployment Rate	7.2%	7.5%	5.8%	4.6%	9.3%	6.3%	4.9%
Poverty Rate	14.0%	14.8%	12.1%	12.5%		13.9%	12.3%
ESI	12.2%	13.7%	17.0%	13.7%	20.4%*	12.1%	14.7%
Median Loss**	39.3%	38.1%	43.3%	41.8%		38.2%	41.4%

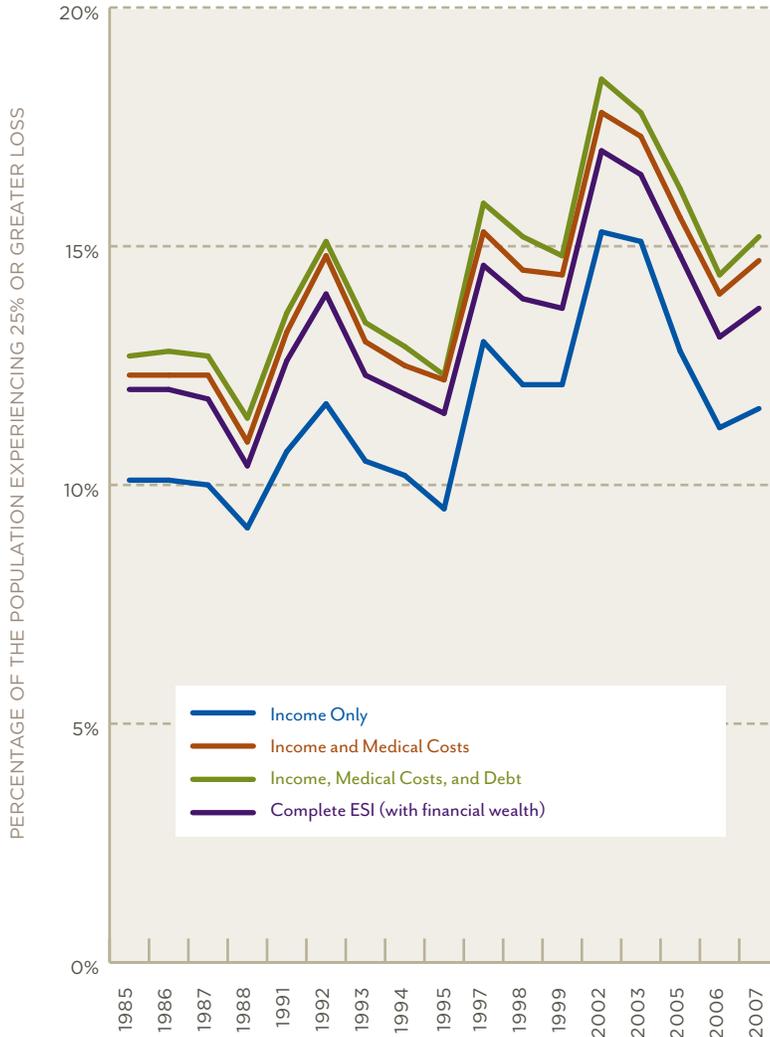
* Projected ESI

** Median percentage loss among those counted as “insecure” (i.e., with losses greater than 25%)

It is possible to trace one dimension of the index—major income loss—back to the late 1960s, using a different data source.¹⁶ The more limited index available back to 1968 indicates that the incidence of major income loss was almost a third higher in 1985 than it had been in the late 1960s (these estimates are further discussed in Part II). Thus, by 1985 Americans’ economic circumstances had already grown more unstable than two decades earlier—making the subsequent increases in the ESI even more striking.

FIGURE 3

The ESI: The Contribution of Income, Medical Costs, Debt, and Wealth, 1985-2007



Finally, breaking the ESI down into its component parts shows that the rising percentage of income loss, growth of out-of-pocket medical spending, and rise in household debt all contribute to the upward trend (Figure 3). By contrast, the degree to which the ESI rises over time is reduced by taking into account the growing liquid financial wealth that some households have to cushion large losses. The biggest contribution to both the level of the ESI and the upward trend is the increasing occurrence of large drops in household income.

The next three sections of this report explain the construction of the ESI, focusing on its three key components: income loss, medical spending shocks, and financial wealth buffers.

II. Income Loss

The primary dataset used in the formation of the ESI is the Survey of Income and Program Participation (SIPP). The SIPP is a nationally representative sample of the households and individuals that constitute the civilian non-institutionalized population of the United States. It has been conducted by the U.S. Census Bureau since 1984 and currently provides the data needed to form the ESI through 2007, with panel (repeat) observations on households and individuals available for two- to four-year periods.

DATA STRUCTURE AND AVAILABILITY

The ESI is based on data from the 1984-1988, 1990-1993, 1996-1999, 2001-2003, and 2004-2007 panels.¹⁷ Each panel is a nationally representative stratified sample with waves of interviews administered at four-month intervals, with an overlapping panel design used prior to 1996 and non-overlapping panels used from that point on.¹⁸ The reference period for each interview is the four-month period preceding the interview month, with income data recorded on a monthly basis. The interviews are spread across four rotation groups, with one-quarter of the interviews conducted in each month. The survey generally was administered beginning in February of each year for the 1984-1988, 1990-1993, 1996-1999, 2001-2003 and 2004-2007 panels and beginning in April for the 1996-2003 panel. Prior to 1992, each panel typically had 8 waves, the 1992-1993 and 2001-2003 panels had 9 waves, and the 1996-1999 panels and 2004-2007 panels had 12 waves, allowing the analysis of individuals for periods ranging from two to four years and enabling short-run panel analyses over an extended time frame.¹⁹

Sample sizes for calculation of the ESI in any given year depend primarily on the initial panel size and the number of overlapping panels in place at that time (along with the impact of sample restrictions described below). The annual sample sizes ranged from about 17,000 to about 46,000 during the overlapping panel years through 1993. The panel size increased with the 1996-1999 panel, yielding 43,000-60,000 observations per year through 2005. In 2006-2007, the SIPP was subject to extensive budget cuts, which reduced the primary sample by about one-half (yielding 21,000-24,000 observations in those years).²⁰

CONSTRUCTION OF ANNUAL INCOME AND RELATED VARIABLES

The ESI's measure of income is household gross money income, which includes earned income (wage and salary income from employment), property and asset

income, cash transfer payments (AFDC/TANF, SSI, Social Security, unemployment benefits, and veterans payments), lump-sum and one-time payments (inheritances, insurance settlements, retirement distributions, etc.), and regular salary or other income from a self-owned business.²¹ As noted, income is recorded on a monthly basis in the survey. Values are coded separately for a wide range of income variables for each household member. However, the SIPP data files provide an aggregated variable that represents the sum of all income components for all household members; this variable was used to represent total household income.

Because both actual tax liabilities and the information necessary to simulate tax burdens are not consistently available in the data on which the ESI is based, the ESI does not subtract taxes from available family income. By increasing income on average, this likely lowers the level of the ESI, though the precise effect depends on the joint incidence of tax burdens and large income drops. It also means, however, that the ESI does not account for the effect of the Earned Income Tax Credit (EITC), which has primarily decreased tax burdens for lower income families.²²

The SIPP data are aggregated into annual observations of household income and related variables for each of the years 1984-2007, with the exception of 2000 (for which a panel was initiated but quickly discontinued). The annual observations corresponding to a specific labeling of the observation year (e.g., 1990) are based on 12 months of data for each sample household, with the specific 12 months depending on the rotation group. Thus, all of the observations coded as a single year will span a 15-month period that generally ranges from October of the year preceding the observation year through December of the observation year. The exception is the 1996 survey, for which the April start date implies that the annual observations refer to periods covering December of the preceding year through February of the year after the observation year. Annual values of the variables are formed by summing the reported values for the 12 reference months from the 3 relevant waves (e.g., for income) or taking the end-period value or average across the 3 waves (e.g., for household characteristics such as size and individual characteristics such as age). This extract enables examination of changes in income and related variables between consecutive years for all years from 1985 to 2007, with the exception of years at the start of non-overlapping panels (1990, 1996, 2001, and 2004) and years in which the available information on income or wealth was insufficient to form the ESI's measure of available income (1989 and 2000). (In the figures, these years are filled using linear interpolation.)

The ESI analyses rely on the matching of consecutive observations on annual income (and related variables such as medical spending). For panels with only 8 waves rather than 9 or 12, the final year of data is incomplete. Similarly, individuals who leave the sample prior to panel completion often have fewer than 12

months of data available in a given year. To account for sample changes related to these factors and to ensure consistent measurement of annual income over time, the analysis sample is restricted to individuals in households with 12 complete monthly observations on income in the reference year. These income data are weighted using annual sampling weights provided in the survey that are designed to adjust the sample for non-random attrition across selected population groups (as opposed to the standard survey weights defined for each wave of data, which are appropriate for point-in-time estimates of population characteristics).

Finally, the ESI measure of income available to each individual is based on an equivalence scale adjustment, so that an individual's measured well-being reflects the size of their household and the sharing of expenses that typically occurs within households. As noted earlier, the ESI uses the equivalence scale recommended by the National Academy of Sciences for poverty calculations.

TREATMENT OF IMPUTED INCOME VALUES

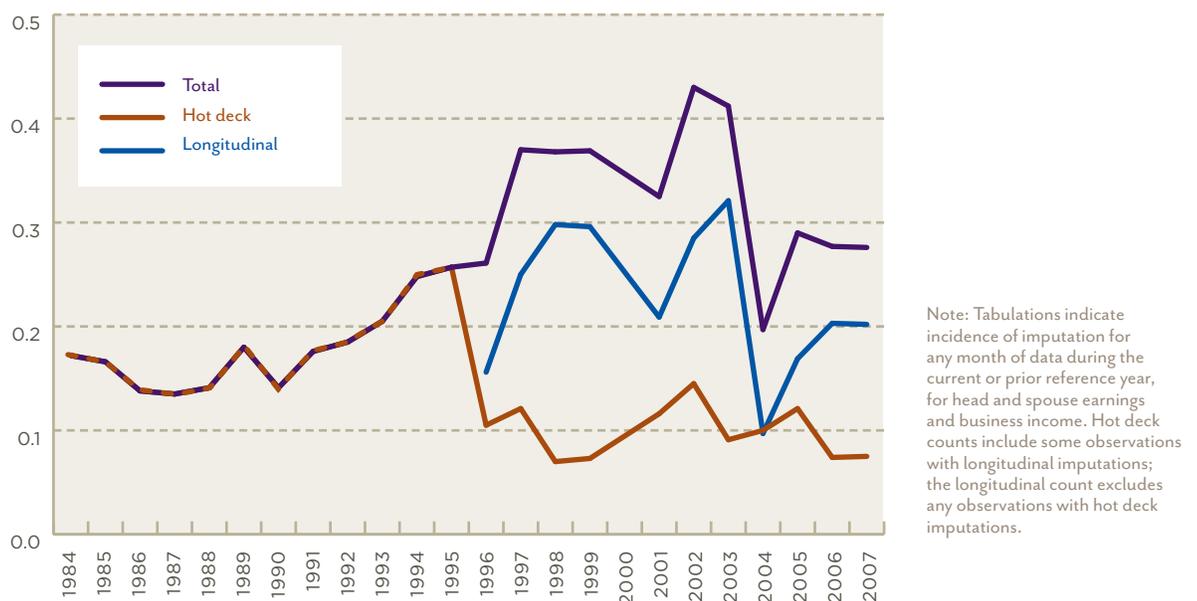
In large household surveys such as the SIPP, direct responses regarding key variables such as income and wealth often go unreported. Under these circumstances, it is common to apply standardized procedures for filling in missing values, known as “imputation” procedures. As has been noted in other recent work, the incidence of imputation of key income components in the SIPP has been rising.²⁴ Census Bureau imputation procedures often match individuals with missing data (“recipients”) to “donors” with similar characteristics. The donor's response is then used to fill in the missing value for the recipient. This procedure is referred to as “hot deck” imputation. Because it is not possible to guarantee that such matches accurately reflect the income received by the individual who did not report it, use of imputed values can impart spurious volatility to annual income changes: If income in one year is fully reported and in the next year is largely imputed, the data may show a sharp change in income even though that individual's true income was relatively stable from one year to the next. The increase in income imputation that has occurred over time in the SIPP therefore may lead to overstatement of the degree to which income volatility (including large declines in income) has increased.

While the rising incidence of imputation in the SIPP has been noted by others, changes in the form of imputation have not. Prior to the 1996 survey, the Census Bureau relied primarily on hot deck imputation, combined with selected longitudinal edits. Beginning with the 1996 panel, longitudinal imputation methods were adopted on a widespread basis. These methods entail either carrying over previous month income values to months with missing data or matching individuals based on income in prior months or waves. In contrast to hot deck imputation, which may exaggerate income volatility, longitudinal imputation is likely to impart a high degree of stability to income values over time.²⁵

Given the potential for artificial instability introduced by observations that rely on hot-deck imputation and the absence of this problem for observations that rely on longitudinal imputation, observations with hot deck imputations of the primary components of household income were eliminated, while observations with longitudinal imputations were retained.²⁶ The primary components are the wage and salary earnings and business income of the household head and spouse. On average, these sources of income account for about 70 percent of total household income, with the remaining share of total household income mostly spread across earnings by other individuals and various sources of unearned income. Imputed values can arise for any of the 12 months of data corresponding to an annual observation. An observation is classified as imputed if any of the 12 monthly observations on any of the four primary income components are imputed. Any observation for which these income components were hot deck imputed in either year were eliminated from the calculation of the income change.²⁷

Figure 4 shows imputation rates by year (unweighted), decomposed into any months of imputation (all types), any months of hot deck imputation (can include longitudinal imputations for some months in the year), and any months of longitudinal imputation (no hot deck) for any of the four primary income components; the tabulations indicate the percentage of observations that would be affected by imputation. The values in the “any” and “hot deck” columns are identical prior to 1996. Overall imputation rates rose noticeably after 1995, but the increase arose primarily from reliance on longitudinal imputation, with hot deck imputation rates dropping substantially.

FIGURE 4
Incidence of Income Imputation (Share of Pre-analysis Sample, by Type)



RETIREMENT ENTRY

Declines in available income that would qualify individuals as insecure according to the ESI are excluded if they occur concurrently with entry into retirement status. Entry into retirement status is defined as occurring in the same year as the first reported receipt of Social Security by the head or spouse (excluding receipt on behalf of children) in the household. Table 2 shows the share of the total ESI sample that is retired as of the reference year or identified as newly retired in the reference year (for years in which the ESI is defined). The calculations are displayed separately for individuals in households in which the head is 50-61 years old, 62-65 years old, and over 65. For the first two groups, the level of retirement and inflow rate of new retirement declines somewhat over the sample frame, which is largely consistent with trends in overall retirement measured from other sources. For the over-65 group, nearly all are identified as retired, with very little annual inflow evident.

TABLE 2

Retirement Status (Share of Total Sample)

Year	Head age 50-61		Head age 62-65		Head age 65+	
	retired	newly retired	retired	newly retired	retired	newly retired
1985	0.156	0.033	0.729	0.116	0.944	0.010
1986	0.160	0.036	0.827	0.140	0.958	0.009
1987	0.142	0.035	0.765	0.119	0.955	0.011
1988	0.133	0.037	0.787	0.092	0.945	0.006
1991	0.135	0.034	0.774	0.100	0.948	0.005
1992	0.132	0.025	0.755	0.118	0.949	0.007
1993	0.133	0.029	0.771	0.082	0.954	0.006
1994	0.139	0.026	0.778	0.103	0.958	0.006
1995	0.135	0.016	0.735	0.072	0.956	0.003
1997	0.162	0.031	0.791	0.141	0.960	0.010
1998	0.156	0.027	0.736	0.104	0.962	0.008
1999	0.161	0.024	0.735	0.120	0.964	0.009
2002	0.148	0.030	0.757	0.118	0.974	0.007
2003	0.158	0.032	0.729	0.144	0.976	0.005
2005	0.172	0.031	0.732	0.100	0.969	0.010
2006	0.166	0.027	0.734	0.097	0.969	0.007
2007	0.170	0.019	0.693	0.103	0.964	0.003

Note: Figures identify the share of the total ESI sample that is part of households identified as retired based on head/spouse receipt of SS payments (currently retired, or newly retired as of the reference year). Weighted using SIPP annual sampling weights.

PROJECTING ESI VALUES FOR 2008-2009

The ESI varies substantially with the overall state of the economy. Our prediction model for the value of the ESI in 2008-2009 is based on a simple regression model that relates the value of the ESI in previous years to general economic conditions. The measures of general economic conditions are the annual unemployment rate (lagged one year), the change in the unemployment rate, and the percentage change in the annual value of real GDP. The model also includes a time trend to account for the increase in the level of the ESI over time, along with a constant.²⁹

The model fits the observed values of the ESI quite well, and the change in the unemployment rate is the most important explanatory factor for movements in the ESI, suggesting strong effects of the business cycle on the incidence of drops in available income. However, the time trend in the model—which shows the consistent over-time change in the ESI, holding macroeconomic factors constant—is also positive and statistically significant, indicating that economic insecurity has increased over time, conditional on aggregate economic conditions.

Based on the model's predictions, the recent severe economic downturn substantially increased economic insecurity, to a level that is well above the highest previous value observed over the history of the series (see Figure 1). This is to be expected, given that the increase in the unemployment rate and its level in 2009 were well above their maximum value over the observed ESI sample frame (1985-2007).

Importantly, because of the ANES field survey, the projections can be validated with actual reports from a representative cross-section of Americans. As part of the survey, respondents were asked in September 2009 about any significant drops in income that they had experienced since January 2008. Counting only those drops that equaled or exceeded 25 percent of the previous year's income, the annualized rate for income declines of this size was 19.4 percent over this time period. Note that this question does not ask about the impact of large medical expenses or debt service on income. If the same projection model just discussed is used to predict only the rate of large income losses in the SIPP, the projected prevalence for 2009 was 18.5 percent. This is in fact *lower* than the ANES survey estimates of income declines of this magnitude, suggesting the model may actually be slightly underestimating the prevalence of large economic losses in 2008-2009.

EXAMINING INCOME LOSSES PRIOR TO 1985

Although the first year in which annual income losses can be calculated using the SIPP is 1985, another panel dataset, the Panel Study of Income Dynamics (PSID), allows for analysis of income losses over a substantially longer period. The PSID has been following a representative sample of U.S. families and their split-offs since the late 1960s, as well as a separate low-income sample known as the Survey of Economic Opportunity (SEO) sample. In 1996, the PSID discontinued the SEO sample (a small group of families were subsequently re-incorporated, but they are not included in the analyses). The PSID also enlarged the representative sample to incorporate post-1968 immigrant groups, and switched to a biennial survey procedure.

Despite its longer time span, the PSID was not used for the construction of the ESI for four reasons: First, because of the move to a biennial structure, it does not allow for year-to-year analysis of income losses after 1996. Although the post-1996 survey asks about income in the “off year,” the quality of off-year reports is low.³⁰ Second, the PSID collects information on household wealth only periodically (in 1984, 1989, 1994, 1999, 2001, 2003, 2005, and 2007); the SIPP wealth data are more consistently available. Third, the PSID data on medical spending are available only after 1999 and only at the level of two years of aggregate spending. Fourth, its sample sizes are much smaller, which precludes reliable analyses of demographic sub-groups.

The PSID is a family-level dataset, and its definition of families differs from the definition of “household” used in other income datasets, such as the SIPP and the March Current Population Survey. To simplify, PSID families are people living together and related by blood, marriage, or adoption, as well as long-term cohabiters. Multiple families may live in a household. There are relatively small differences between estimates at the household level and those at the family level, but the distinction should be kept in mind when comparing PSID results with findings from other datasets.

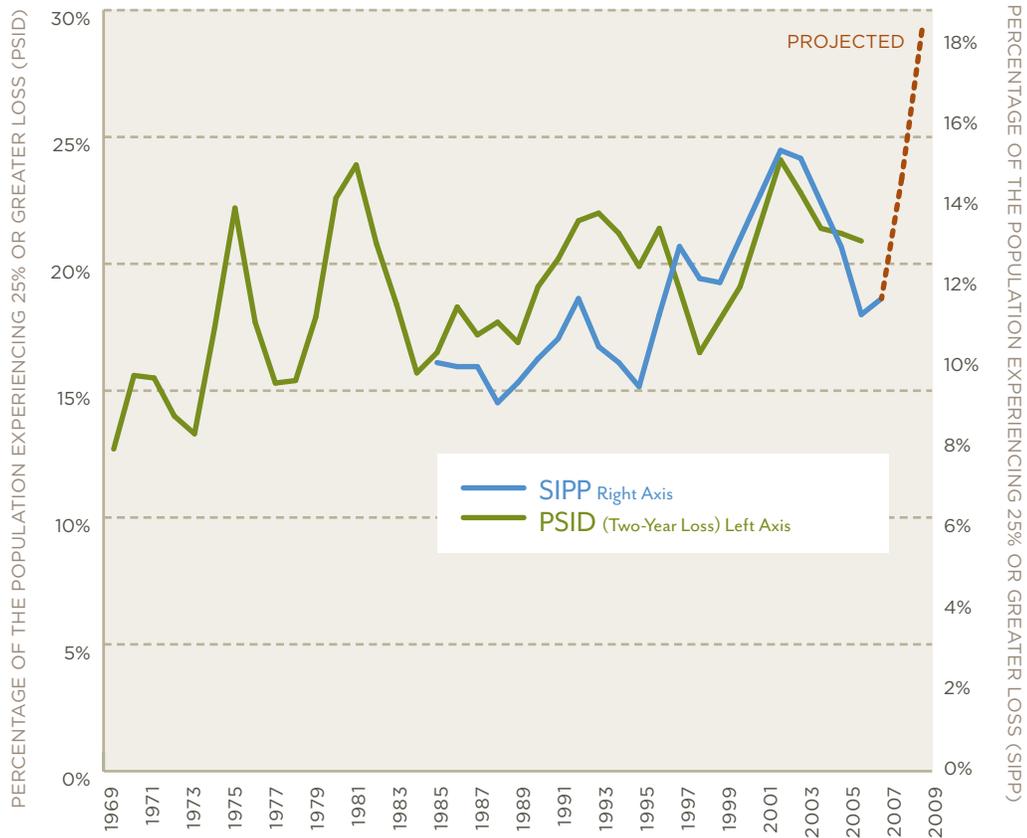
The ESI analyses look at individuals’ equivalized “family money income”—which includes all sources of cash income before taxes, including earnings, asset income, government monetary benefits, private cash transfers, and business income, but does not include lump-sum and one-time sources of income, such as inheritances and retirement distributions. The sample includes the representative and SEO samples. All results are weighted using individual weights that account for the oversampling of low-income respondents as well as attrition from the beginning of the PSID to the present.

Because it has been conducted once every two years since 1996, the only way to look at income loss after 1996 is to compare income in one year to income two

FIGURE 5

**The ESI: The Rising Prevalence of Large Income Declines, 1969-2007,
Evidence from the SIPP and PSID**

(with 2008-2009 Projections; Income Loss Only)



years later, rather than from one year to the next. Partly for this reason, the PSID shows a higher proportion of Americans experiencing 25 percent or greater income drops than does the SIPP, although the trends match relatively well during the overlapping years. Putting the earlier PSID data on a separate axis, as done in Figure 5, makes comparing over-time trends for the overlapping years easier.³¹ (Neither of these series excludes large income drops coincident with retirement.)

As Figure 5 shows, the share of individuals experiencing drops of 25 percent or greater from one year to two years later has risen substantially: From 1969 to 2004, the incidence almost doubled. The upward movements correspond to cyclical downturns, but the series do not decline noticeably during the extended expansion of the 1990s.³²

The PSID results indicate, therefore, that the prevalence of large income losses rose between the late 1960s and mid-1980s, before the SIPP data became available, and continued to rise in subsequent years roughly in line with the observed increases in the SIPP.³³

III. Out-of-Pocket Medical Spending

The ESI treats medical out-of-pocket spending (MOOP) as a constraint on alternative spending that reduces available family income. MOOP includes insurance payments; doctor, dentist, and hospital fees; and prescription drugs and durable medical equipment, so long as these costs are paid by individuals directly, rather than by insurance or other payers.

The challenges to estimating MOOP in a way consistent with the ESI's design are formidable. While SIPP income data are available over the complete sample frame, annual data on household medical spending only became available beginning with the 1996 panel. In addition, as a result of the aforementioned cuts in the SIPP budget, these data were not available for the final two years of the 2004 panel (2006-2007). Given the limited availability of these data, and some shortcomings with respect to their measurement of medical expenses for some types of households, the approach to MOOP adopted for the ESI was to impute total medical spending for each household using data from the Consumer Expenditure Survey (CEX).³⁴ In particular, data from the CEX were used to impute annual variation in family medical spending into the SIPP dataset. These cross-sectional estimates, along with evidence on the persistence of medical spending drawn from the SIPP, were then used to impute subsequent medical spending for the same families. This allows the ESI to capture both the level and dynamics of MOOP for families in the SIPP. Because the SIPP contains data on MOOP in recent years, it is possible to cross-check these estimates against the actual values in the SIPP.

THE CEX SURVEY AND MOOP

The CEX is a series of five interview panel surveys in which individuals participate for 12 months. The initial interview focuses on gathering baseline family demographic information, while the latter four surveys gather consumption over the preceding quarter. The final interview includes supplemental questions used to gather additional family income and asset data, including changes in asset values over the preceding year. (For simplicity, the short CEX panels are referred to in what follows as “cross sections.”) All data are collected in face-to-face interviews. Data for calendar years 1984-2007 are available, but because of survey instrument changes, data gaps exist in 1985 and 1995.

CEX consumer units encompass legal and extended families living together, individuals living alone, and two or more individuals living together who pool

financial resources.³⁵ This definition includes as single consumer units both unmarried cohabiting couples who consider themselves financially interdependent as well as multiple generations of a given blood line who live together (e.g., parents, grandparents, and children). The CEX provides weights to estimate nationally representative statistics.

The CEX is designed to elicit accurate measurement of consumer expenditures on a variety of goods and services. For this reason, it is regarded as the best source for information about consumer behavior, especially when compared to surveys that require respondents to retrospectively recollect medical costs using a short battery of annual survey questions. (Note that the CEX measures MOOP expenditures, and not MOOP liabilities. It therefore does not inflate MOOP expenditures due to charges that are subsequently reduced, but it also does not capture MOOP-related debt.) It also provides comprehensive estimates of household income, although the SIPP is regarded as the better tool for accurately measuring all sources of household income.

A final note about sample restrictions and data collection: Beginning with the publication of data including some consumer units first interviewed in 2003, CEX instituted imputation of consumer unit income, using a procedure similar to the hot deck imputation discussed earlier. Prior to that point, only households classified as “complete” income reporters were included in the U.S. Bureau of Labor Statistics (BLS) analysis.³⁶ (In 2001, the BLS also began allowing interview respondents to report “bracketed” income to diminish non-response.) For over-time consistency and to ensure imputed values do not distort the findings, the ESI analysis is restricted to households that completed all five interviews and were classified as complete income reporters. For years in which imputation was used, observations for which income was imputed are dropped. This is the same procedure used for the SIPP with regard to hot deck imputation. If imputed income is included, the CEX shows income rising sharply beginning in 2003 in a manner that is inconsistent with evidence from the Current Population Survey (CPS) and other sources.

SURVEY ACCURACY AND RELIABILITY

Direct comparison of estimates of out-of-pocket medical spending obtained from the CEX with those from the comprehensive National Health Accounts (NHA) show that the CEX generally accounts for about 70 percent of such spending. The difference largely arises from the CEX’s reliance on household survey data, versus the administrative data used to form the NHA estimates. Nonetheless, the CEX matches national accounts data reasonably well.³⁷ Based on comparisons with employer-based data from the Medical Expenditure Panel Survey (MEPS), it appears that proxy reporting within CEX sample households causes systematic

underestimation of out-of-pocket spending on health insurance premiums for family policies.³⁸ Despite this concern about underreporting, researchers have generally agreed that reported spending should not be adjusted upward to match national accounts.³⁹

Regarding income data, the CEX accounts for about 85-90 percent of the before-tax income levels found in the official Census income tabulations from the CPS,⁴⁰ and the CEX yields long-term trends in income inequality that are similar to those found in the CPS.⁴¹

PATTERNS OF MOOP

The series of CEX surveys allows the calculation of changes in MOOP as a proportion of family income during the period covered by the ESI. Table 3 reports average MOOP as a percentage of income (top-coded at 200 percent to minimize the effect of outliers likely arising due to measurement error) for two five-year periods—1986-1990 and 2003-2007—as well as the proportional and absolute changes in those numbers. Average spending as a proportion of income has increased across the income and age distribution with the notable exception of the lowest-income families headed by persons 45-64.⁴² These increases are, in many cases, large in both proportional and absolute terms: On average, families in the middle income quintile now spend at least 0.7 percentage points, and as much as 3.6 percentage points, more of their income on MOOP than they did in the late-1980s. These are proportional increases of between 14 and 24 percent. Across all age groups and income categories, the average increase is 1.5 percentage points, or 17.8 percent.⁴³

Figure 6 displays a complete time series of mean and median MOOP as a share of income for the same age and income groups with the data aggregated into five-year periods. Over the entire sample period (and for a different breakdown of years), the change in spending is similar to what is reported in Table 3. More generally, the patterns of spending observed in the CEX for the entire period as well as for subsets of this period correspond with analysis drawing on the MEPS and other data sources.⁴⁴ For example, among the non-elderly population, average spending in the lowest income quintile has not increased during the last decade. This pattern may reflect the expansion of government insurance programs to low-income working families with children, an increase in forgone care, or some flattening of real costs for those who lack private health insurance due, for instance, to less reliance on emergency rooms by the uninsured.⁴⁵

The CEX, however, shows both a lower level of mean and median spending in the 2000s than does the MEPS and a less sharp upward trend from 2001 on than do the MEPS and other sources. (On the other hand, its findings match more closely

TABLE 3

MOOP as a Percentage of Income, 1986-1990 and 2003-2007

		Age of Household Head						
		18-34	35-44	45-54	55-64	65-74	75+	
		Mean 1986-1990						
INCOME QUINTILE (WITHIN AGE)	1	5.8%	10.7%	16.6%	24.9%	23.6%	25.7%	
	2	3.7%	4.1%	4.7%	9.0%	14.5%	18.5%	
	3	2.9%	3.1%	3.4%	6.4%	13.1%	15.2%	
	4	2.1%	2.8%	2.4%	3.7%	8.6%	12.9%	
	5	1.5%	1.8%	2.0%	2.8%	4.9%	9.7%	
			Mean 2003-2007					
	1	6.8%	13.1%	14.0%	21.9%	26.6%	39.8%	
	2	4.2%	4.7%	5.7%	10.8%	18.2%	22.3%	
	3	3.5%	3.8%	4.2%	7.3%	15.8%	18.9%	
	4	2.5%	3.1%	3.3%	4.6%	10.4%	15.0%	
5	1.7%	2.0%	2.5%	3.2%	6.3%	9.8%		
		Percentage Change in Mean, 1986-1990 to 2003-2007						
1	17.2%	22.0%	-15.6%	-12.2%	12.4%	55.2%		
2	12.8%	14.5%	21.4%	19.5%	25.5%	20.6%		
3	23.0%	23.1%	22.4%	14.0%	20.9%	23.7%		
4	16.7%	12.9%	36.1%	23.7%	20.9%	16.4%		
5	12.7%	7.9%	21.4%	12.2%	30.1%	1.4%		
		Raw Change in Mean, 1986-1990 to 2003-2007						
1	1.0%	2.4%	-2.6%	-3.0%	2.9%	14.2%		
2	0.5%	0.6%	1.0%	1.8%	3.7%	3.8%		
3	0.7%	0.7%	0.8%	0.9%	2.7%	3.6%		
4	0.4%	0.4%	0.9%	0.9%	1.8%	2.1%		
5	0.2%	0.1%	0.4%	0.3%	1.5%	0.1%		

Source: CEX

the SIPP medical spending data for the years they are available, as discussed shortly.) No other micro-level source, however, allows the same consistent estimation of MOOP that the CEX does over the 1985-2007 period. The ESI analyses make no effort to adjust the CEX findings to reflect the higher levels and upward trend seen in other data sources in recent years, which means that the ESI may be understating both the extent and the upward rise of economic insecurity caused by MOOP in the last decade.

FIGURE 6

CEX MOOP as Share of Income by Age Group and Income Quintile



IMPUTATION PROCEDURE

The imputation procedure used to estimate the proportion of family income spent on medical care reflects four guiding observations. The first is that when properly log transformed, the distribution of medical spending as a proportion of income is distributed normally, subject to left censoring (families cannot spend less than \$0, or 0 percent of their income, on medical care; the ESI analysis also right censors to minimize the effect of outliers and measurement error, capping MOOP at 200 percent of family income).⁴⁶

The second insight is that the shape of the normal distribution describing medical spending as a proportion of family income varies with income and age: By and large, poorer and younger families have wider variance in spending as a proportion of income than do wealthier and older families. The former pattern likely arises because poorer families are less likely to have regular health insurance expenditures, but when they experience health events, are more likely to spend a large proportion of their income on care. By contrast, wealthier families are more likely to have regular health insurance expenses and seek regular care, while the high spending associated with medical events is a smaller proportion of their income or is mitigated by insurance. With regard to age, younger persons spend more episodically, while older persons experience more regular costs.

The third observation is that relatively few families experience average levels of MOOP— instead, MOOP as a proportion of income is relatively variable. For this reason, rather than assuming that all similar families experience the average level of MOOP for those types of families, the proper approach is to instead impute stochastically using the observed dispersion of spending for a given age and income group.

The final observation is that there is a great deal of serial correlation—or over-time persistence—in family medical care spending. For this reason, an imputation procedure that stochastically assigned families' spending levels from the observed distribution of spending would overstate the variability of spending. By contrast, a procedure that assumed all families spent the average amount would artificially depress the variability of spending.

These four observations motivate the particular imputation algorithm employed for the ESI. It breaks the imputation procedure into two parts. The first part predicts spending for a family in year t , a “static” imputation process. The second predicts spending in year $t+1$ on the basis of a model that takes into account the first-year level of (imputed) spending, a “dynamic” imputation process.

STATIC IMPUTATION USING THE CEX

The imputation of cross-sectional MOOP uses a modified version of the CEX data discussed earlier. In particular, because of the relatively small sample sizes in any given annual CEX sample, the first step was to generate a new CEX dataset that, for each year, draws on observations from that year's CEX as well as the prior and subsequent three years (e.g., the 2004 data are actually constructed from observations from 2001-2007). This pooling smoothes the annual variability arising from sampling variation (i.e., random statistical fluctuations).

With this modified dataset, a log transformation of MOOP/Family income ($\text{Ln}[1+100*[\text{medical spending}/\text{income}]]$) is calculated for each family/consumer unit for each year. The sample is then partitioned on the basis of the age of the family head (six age categories) and, within these age categories, on the basis of where each family would lie in the income distribution (quintiles) in that year. For each year, age group, and income quintile, a separate censored regression model (2-limit Tobit) is estimated. The predictors are the age of the household head (within the age category), NAS-equivalent family size, and income position within the quintile (entered linearly and as quadratic and cubic terms). Parameters (regression coefficients and a measure of dispersion) from these models are then saved. The imputation process continues with the calculation of identically constructed measures of income, age, and family size in the SIPP, which are combined with the coefficients recovered from the CEX data to predict spending for

a household in the SIPP. This prediction incorporates a draw from the estimated stochastic distribution calculated for that year, age group, and income quintile in the CEX.

When applied to the CEX, this imputation procedure reproduces the observed spending levels in the CEX closely. If, in other words, the same imputation procedure designed to impute MOOP in the SIPP is instead applied to the CEX, it does well at “recovering” the original data that guided the imputation effort. Kernel density plots of the Log-transformed MOOP as proportion of income by age group and income quintile appear in Figure 7, followed by plots in Figure 8 that break the data down by year instead of by income quintile and age group. These distributions appear quite similar. Further analysis of the mean, median, and standard deviation of real and imputed spending also demonstrate acceptable fit.

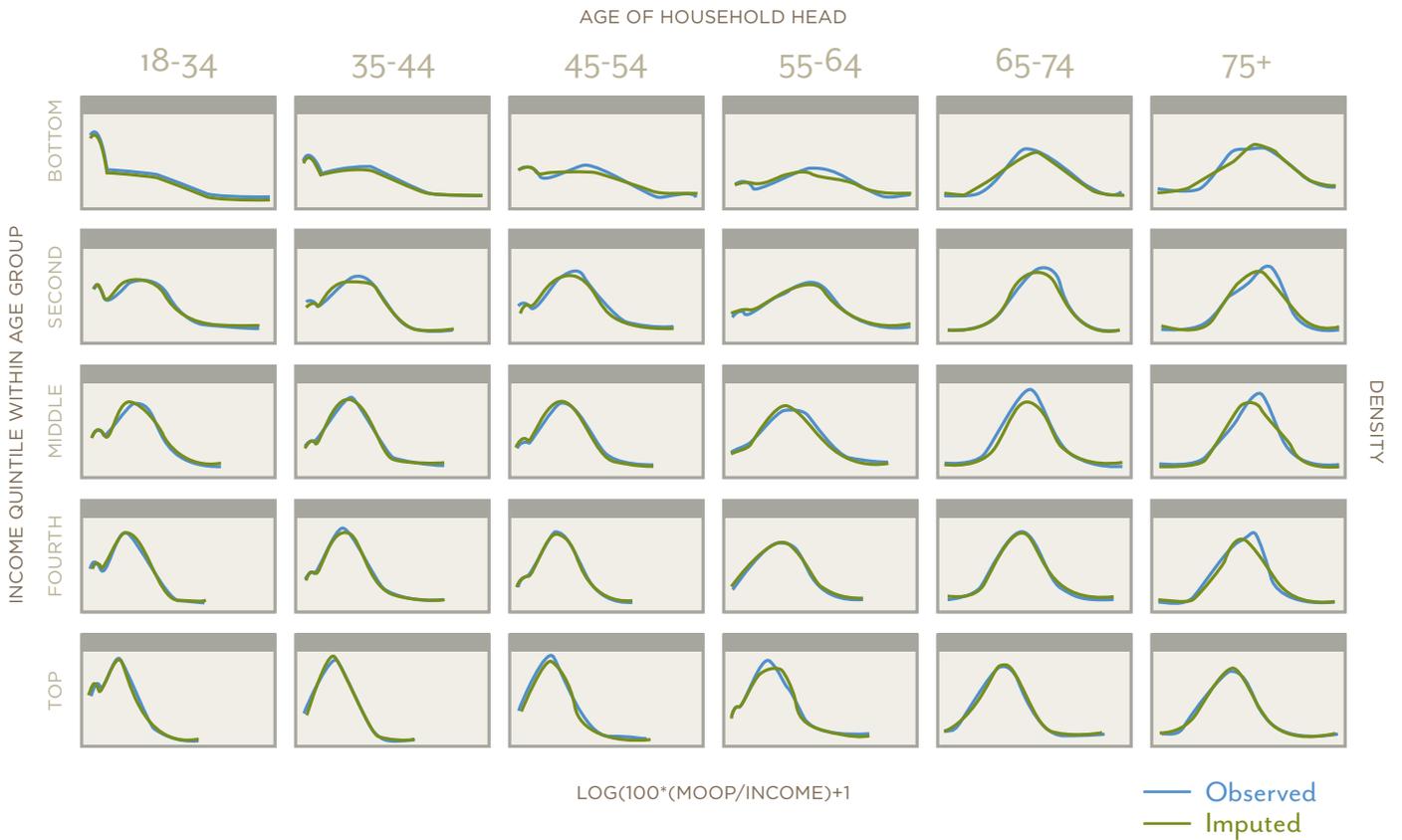
DYNAMIC IMPUTATION USING THE SIPP

The dynamic imputation process, predicting MOOP at time $t+1$ conditional on MOOP at time t , relies on a subset of data from the larger SIPP dataset used for constructing the ESI. Pooling observations from the SIPP for the period 2002-2005, during which panel estimates of MOOP and income are available for a large proportion of SIPP households, it is possible to construct age groups and income quintiles (within age groups) in the same manner as for the CEX-based imputation. The one hurdle to this process is that, relative to the CEX (and the MEPS), there appears to be too many households reporting no MOOP spending at time $t+1$ or time t in the SIPP. Because the CEX has substantial advantages as a measure of consumer spending over the SIPP, it is far more likely to be accurate. Adjusting downward the proportion of families reporting no MOOP spending in the SIPP to match that observed in the CEX produces distributions of MOOP that match closely between the SIPP and CEX.⁴⁷

With this modified dataset, the dynamic imputation procedure begins with the calculation of MOOP/income at time $t+1$ and time t for each household in our SIPP sample. Within each age group and income quintile, observed spending (as a proportion of income) is then ranked at both time $t+1$ and time t (for example, if there are N households in a given grouping, $\text{RankMOOP}_{i,t}/N$ and $\text{RankMOOP}_{i,t+1}/N$). The reason for using ranks of MOOP/income, rather than levels of MOOP/income, is that panel measures of both MOOP and income are available only for a relatively recent period in the SIPP. If the distribution (e.g., mean, standard deviation) of spending is different for a given age and income group in a period not covered by the SIPP, using the level rather than the rank of spending would wrongly assume that the relationship between a given level of spending at time t and that level of spending at time $t+1$ was the same in prior pe-

FIGURES 7 & 8

CEX Imputed and Observed MOOP/Income by Age Group and Income Quintiles



CEX Imputed and Observed MOOP/Income by Year



riods. By contrast, considering the relationship between ranks in spending at time t and time $t+1$ allows for the underlying distribution of spending to change (as it does in the CEX).⁴⁸

The next step in the dynamic imputation process is to estimate regression models (by age group and income quintile) where the current rank in spending is modeled as a linear function of lagged rank (entered linearly and as quadratic and cubic terms), change in equivalent family size, and change in income (with increases and decreases entered separately). Parameters (regression coefficients and a measure of dispersion) from these models are then saved. As with the static process, to apply these estimates requires calculating identically constructed measures of income, age, and family size in each year of the SIPP panel, and then combining them with the coefficients recovered from the imputation to predict rank spending for a household. As before, this prediction incorporates a draw from the estimated stochastic distribution calculated for that age group and income quintile.

In the dynamic process, however, an additional step is needed. Because the correspondence between ranks and spending as a proportion of income will vary for each group to which the imputation is applied (i.e., because the particular distribution of spending is different for a given age and income group in a given year), predicted ranks must be converted into spending using the observed distribution of spending *levels*, which simply requires seeing what actual spending level a predicted position in the distribution of spending implies. Those spending levels are, of course, the product of the static imputation procedure.

Although, as will be shown, this approach produces reasonably accurate predictions of spending for the recent period in which it can be validated in the SIPP, it is limited in at least two respects. First, there is no way to validate the relationship between current and past spending for periods in which SIPP data on spending are unavailable, and so it could be the case that this relationship has changed over time in ways that cannot be observed. Earlier MEPS panels unfortunately lack sufficient panel income and out-of-pocket insurance premium measures. While there is no reason to think that the over-time dynamics of medical spending were fundamentally different from the mid-1980s through the early 1990s than they were thereafter, it could be the case that they changed over time in ways that cannot be observed. Of course, this problem would also be true for any imputation procedure that used data for one period and applied it to another.

Second, the dynamic imputation procedure does not—and cannot, because of data limitations of the CEX—account for the changing prevalence of health insurance. Insurance coverage is associated with lower variability in MOOP spending (both because premiums expenditures are regular and because insurance provides protection against high non-premium MOOP). At the same time, levels of

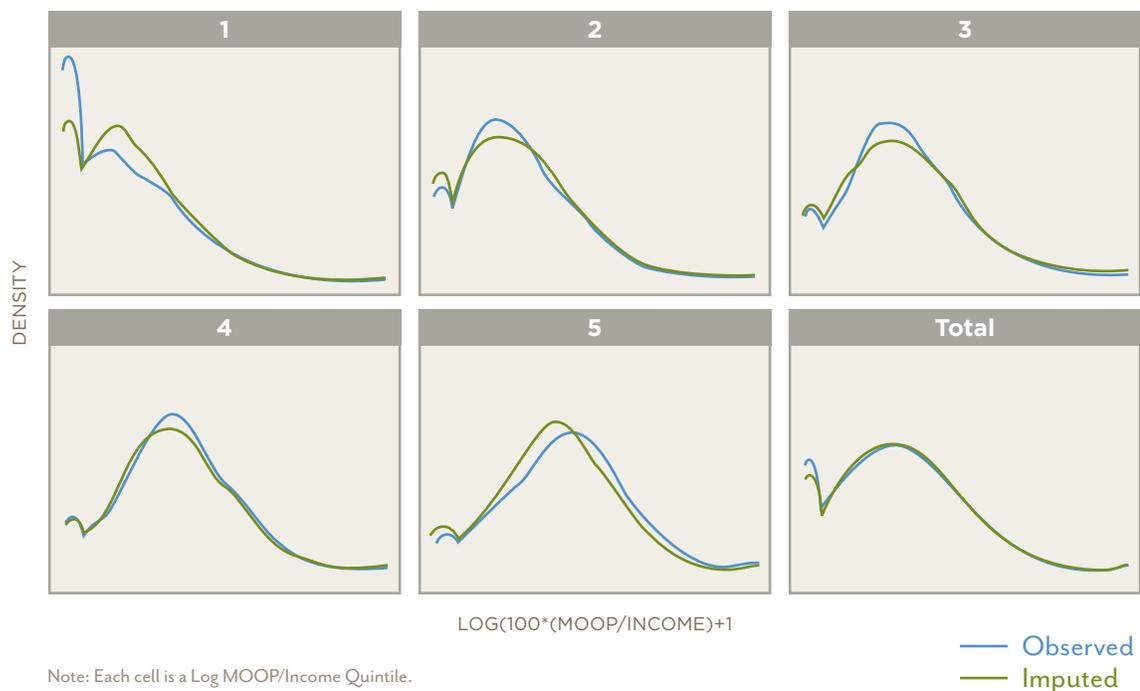
insurance coverage have declined during the period covered by the ESI. Using the observed relationship between previous and current MOOP seen in recent years—a period in which insurance is less prevalent—likely overstates the variability in MOOP for earlier periods in the ESI during which insurance coverage was more widespread.⁴⁹ For this reason, the ESI incorporating imputed MOOP likely underestimates the rise in recent level of insecurity relative to what would be calculated with direct measures of panel MOOP for all years of the ESI.

BENCHMARKING THE DYNAMIC IMPUTATION PROCEDURE

The appropriate way to benchmark the dynamic imputation procedure is to compare the distribution of predicted spending levels in the SIPP at time $t+1$ to actual spending levels in the SIPP at time $t+1$ conditional on spending at time t . How well does the dynamic procedure predict the spending in one year, given spending the year before? Figure 9 answers this question. It displays kernel density plots of the observed and predicted log-transformed MOOP as a proportion of income for five quintiles of prior spending. These distributions appear quite similar, with some evidence that spending for the lowest-spending category is over-predicted and spending for the remaining categories is under-predicted. More important, however, the results in Figure 9 confirm the reasoning for conditioning imputed current period spending on prior spending: The cells are clearly different across levels of prior spending, with lower (higher) levels of spending at time t associated with lower (higher) levels of spending at time $t+1$.

FIGURE 9

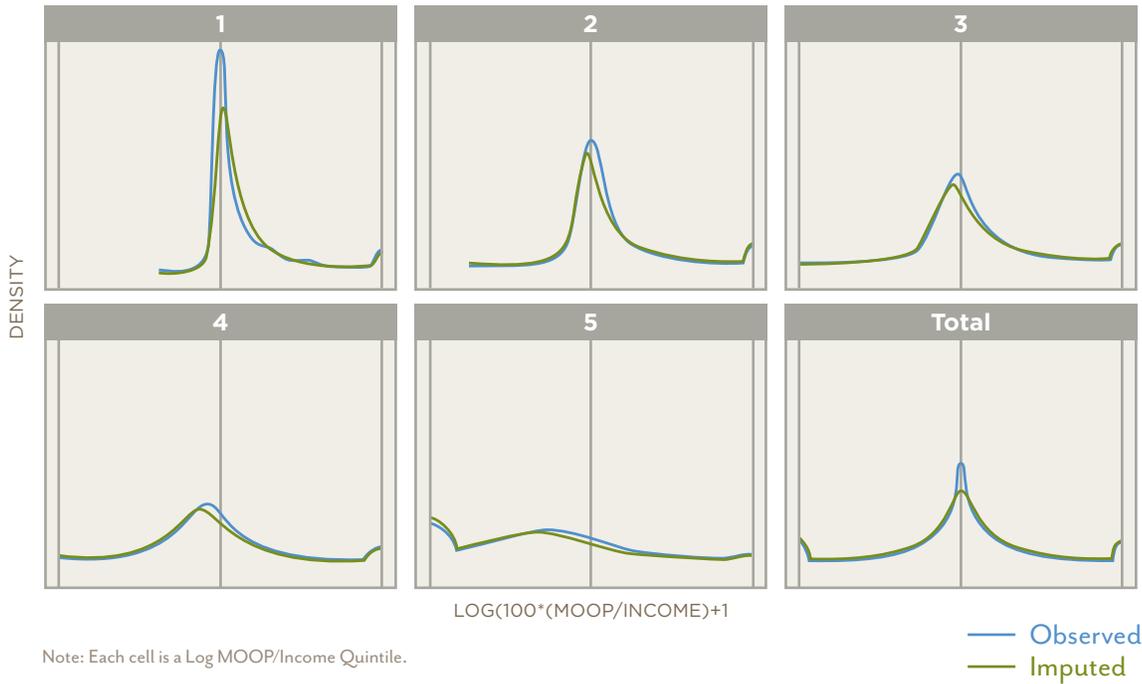
SIPP Imputed and Observed MOOP/Income by Log MOOP/Income Quintiles



FIGURES 10 & 11

SIPP Imputed and Observed Change in MOOP/Income by Log MOOP/Income Quintiles

Vertical lines at -15%, 0, and 15%



SIPP Imputed and Observed Change in MOOP/Income by Log MOOP/Income Quintiles

Given Income Drop of at Least 25%, Vertical lines at -15%, 0, and 15%

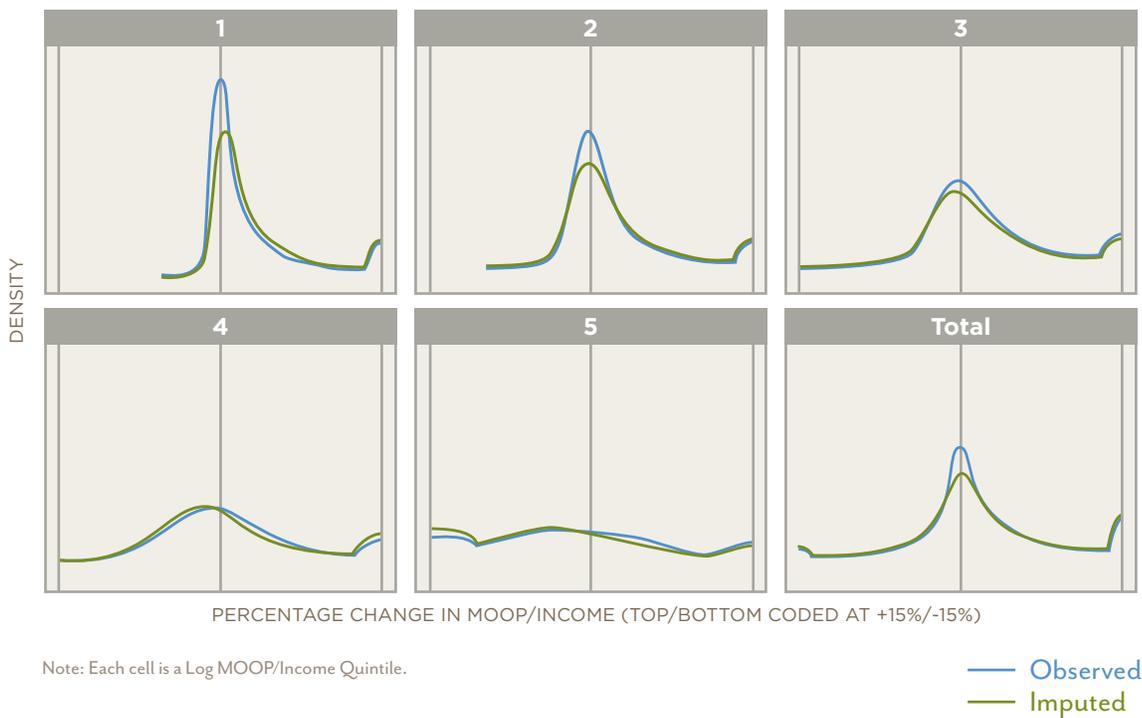


Figure 10 displays kernel density plots of the imputed and observed *change* in MOOP as a proportion of income. These figures are similar, suggesting that the imputation of MOOP-induced changes in available income is approximating the effect that would be observed with more complete survey data. Finally, Figure 11 repeats the Figure 10 display, but this time limiting the presentation to households experiencing a 25 percent drop in income. Given that one motivation for the dynamic imputation is to account for the covariation between income loss and increasing health expenditures, it is reassuring that the predicted and observed distributions are similar. The imputation procedure may slightly overestimate spending for households that lose income but were not previously spending very much. However, the procedure may underestimate it for households that lost income and were previously spending a great deal. These effects are likely to be countervailing in their impacts on the overall ESI.

THE SENSITIVITY OF THE ESI TO THE EXCLUSION OF EMPLOYER-PAID HEALTH PREMIUMS

The CEX includes only the out-of-pocket payments of households for insurance and medical care. It does not include the value of employer contributions to employee health plans (employer-provided health insurance, or EPHI). This omission introduces a potential bias into the ESI. If the EPHI status of a household changes, this is likely to be reflected in a change in wages as well: In essence, individuals “pay” for the value of employer contributions to EPHI through reductions in earnings.⁵⁰ The bias arises because the change in wages is reflected in the ESI measure of available income, but the change in the value of EPHI is not. Importantly, the bias can go in either direction. For households in which EPHI is lost or given up in return for higher wages (for example, as a result of a job change), measured losses in household income will *understate* reductions in total household income inclusive of EPHI, and the ESI may falsely label some households as not incurring a 25 percent or greater drop in available resources when they do. For households in which EPHI is gained (and earned income is reduced to offset the employer’s contribution to EPHI), measured losses in household income will overstate reductions in total household income inclusive of EPHI, and the ESI may falsely label some households as incurring a 25 percent or greater drop in available resources when they do not.

Fortunately, the core surveys in the SIPP provide information on the receipt of EPHI within households, making it possible to form a measure of the number of months that individuals are covered through EPHI received in their own name or through a family member. Reliable information on EPHI coverage is available for the period 1990 and forward, which enables assessment of the likely bias for the years 1991 forward but precludes direct incorporation of the value of EPHI into the ESI over our complete sample frame.

To assess the extent and direction of this bias requires examining the joint incidence of changes in household available income and changes in EPHI status. The earnings offset from EPHI cannot be directly observed in the SIPP. However, Bureau of Labor Statistics data from the Employer Costs for Employee Compensation program indicate that the value of EPHI is about a tenth of wages on average, while data on employee cost sharing from the MEPS indicate that private-sector employers typically cover about 80 percent of these costs. In the SIPP data, wage payments constitute about 75 percent of household income on average. As such, the value of EPHI is equal to about 6 percent of household income in a typical insured household ($0.10 \times 0.75 \times 0.8 = 0.06$, or 6 percent).⁵¹

The first column of Table 4 lists the ESI values for each measured year (back to 1991). These values represent the fraction of individuals whose available income fell by at least 25 percent (including MOOP and adjusted for debt servicing, wealth, and retirement). It varies from 12 percent to 17 percent in those years. The second column lists the fraction of individuals whose income fell by 25-31 percent and who gained health insurance (measured as any number of months covered). This represents an upper-bound estimate of how many individuals might falsely be labeled as “insecure” according to the ESI because the value of employer contributions to EPHI gained is omitted from the measure of income. The 6 percentage point range (25-31 percent) represents the value of employer contributions to EPHI described above; it is an upper bound to the true value of changes in EPHI status because individuals do not typically lose EPHI for all 12 months in a year. The potential upward bias is quite small, ranging from 0.2 to 0.4 percentage points.

TABLE 4

EPHI Bias Test (Shares of Total Sample)

Year	ESI	Positive bias	Negative bias
1991	0.128	0.002	0.008
1992	0.137	0.004	0.008
1993	0.127	0.003	0.008
1994	0.121	0.003	0.007
1995	0.118	0.004	0.005
1997	0.147	0.004	0.006
1998	0.137	0.003	0.006
1999	0.139	0.003	0.006
2002	0.170	0.004	0.007
2003	0.165	0.004	0.007
2005	0.149	0.003	0.007
2006	0.131	0.002	0.006
2007	0.137	0.003	0.006

Note: Figures refer to sample shares; weighted using SIPP annual sampling weights. See text for discussion.

The final column lists the bound calculation for the potential opposing bias. It represents the fraction of individuals whose available income declined by 19-25 percent and whose number of months of health insurance coverage also declined. This represents an approximate upper-bound estimate of how many individuals might falsely be labeled as not seeing a 25 percent drop in total income due to the omission of the lost value of employer contributions for EPHI. This is slightly larger than the opposing bias, ranging from 0.5 to 0.8 percentage points. The slightly larger size of the negative bias over the positive bias indicates that the omission of the value of employer contributions to EPHI likely causes the ESI to slightly understate the true value of insecurity. The degree of understatement is approximately equal to the difference between the second and third columns, which ranges from 0.1 to 0.6 percentage points—that is, very small compared with the typical ESI values in the first column.

In sum, the likely bias of excluding the value of EPHI from household income turns out to be small. Moreover, it is in the direction of understating, rather than overstating, the size of income losses. Individuals who lose EPHI typically have experienced a negative employment shock that reduces their wages as well, while individuals who gain EPHI typically have experienced a positive employment shock that increases their wages. Given the slow erosion of EPHI coverage over time, the omission of the value of EPHI from the index may also impart a small downward bias to the measured upward trend in the ESI over time.

IV. Wealth, Retirement Savings, and Debt

To account for the additional security—or insecurity—that savings or debt may bring, the ESI incorporates wealth holdings in the three ways noted earlier:

- 1** for households with heads aged 60 or older, earmarked retirement savings are converted into an *annuity* and added to the household’s income, decreasing the ESI;
- 2** for households that are in debt, household income is reduced by the annual amount of *debt service*—based on the assumption that debt needs to be repaid within five years at an interest rate of 9 percent—increasing the ESI; and
- 3** individuals are never counted as insecure if their household has an *adequate financial safety net*, to compensate experienced losses until recovery of pre-decline income levels, decreasing the ESI.

Data on household wealth and net worth (assets and liabilities) are available from topical modules in the SIPP conducted once per year beginning with the 1996 panel (with the exception of 2006-2007) and for selected years prior to that (typically once per panel). These data are comprehensive, covering financial assets (interest earning), housing wealth (home equity estimated as self-assessed home value minus the amount owed on any existing mortgages), the value of other assets such as vehicles and real estate other than residences, and amounts of secured and unsecured debt.⁵²

While the SIPP wealth data are comprehensive, they have two salient weaknesses. First, many years are missing. Second, wealth components in the SIPP are heavily imputed. For these reasons, the most reliable and consistent way to use the SIPP wealth variables is to assign respondents their household wealth mean value, adjusted for family size, for all years they are in the SIPP.⁵³ This avoids the artificial wealth volatility induced by imputation and by measurement error, and it allows the wealth data to be used regardless of the number of wealth observations (so long as household wealth is recorded in at least one year). By treating household wealth holdings as fixed over the two- to four-year panels of the SIPP, however, the ESI cannot measure wealth instability—another respect in which it may understate economic insecurity, particularly during the most recent years.

RETIREMENT ANNUITY

The ESI treats retirement wealth in a manner designed to achieve two goals. The first is to capture the (increasing) role of earmarked retirement savings—such as

IRAs and defined-contribution pension plans (e.g., 401(k) accounts)—as a source of income for older Americans. (Private defined-*benefit* pensions, which are becoming less prevalent over time, are included at payout in the SIPP measure of gross money income on which the ESI is based.) The second goal is to segregate such earmarked, tax-favored retirement accounts from the calculation of wealth that is available to buffer households against income losses. The reasoning is simple: These funds can only be accessed with a penalty before age 59.5, and accessing retirement savings prior to retirement will generally result in a reduction in long-term economic security.

To address this differential role of retirement savings, earmarked retirement savings (specifically, “IRA and KEOGH accounts” and “401K and Thrift Savings Plans”) are converted into “end of year” (ordinary) annuities.⁵⁴ Households are assumed to tap into earmarked retirement savings at age 60 and to draw them down to zero in equal annuity payments over the course of their life expectancy (assuming a 3 percent real rate of return). By increasing household income and therefore raising the absolute amount of income loss required to trigger the 25 percent standard, annuitizing retirement wealth at age 60 decreases the ESI, reflecting the idea that retirement savings increase economic security. It should be emphasized that it makes little difference for the ESI which particular interest rate we assume for the calculation of the annuity (at least over the reasonable range of 1 to 8 percent).

As Table 5 shows, most households headed by older persons did not have defined-contribution retirement wealth until very recently. Indeed, prior to 2006, median defined-contribution retirement savings was zero for Americans aged 60 or over. For those at the upper end of the distribution, however, defined-contribution retirement wealth has increased dramatically.

DEBT SERVICE

In discussing the treatment of debt, it is useful to first clarify the ESI definition of liquid financial wealth. The underlying definition is closely linked to the notion of “precautionary saving”—saving designed to buffer shocks to income. Precautionary saving is generally conceived of as wealth that can be accessed quickly and easily without sacrificing the use value of one’s property. Cash, stocks, mutual funds, bonds, and other financial assets, as well as vacation homes and other real estate besides one’s home, are different from owner-occupied housing or a vehicle in both their liquidity and the degree to which they have use value. For these reasons, they are the core of the ESI’s measure of liquid wealth.

More specifically, the ESI estimate of liquid financial wealth is the sum of interest-earning assets held at financial institutions, other interest-earning assets, regular checking accounts, stocks and mutual fund shares, vacation homes and

TABLE 5

Distribution of Equivalized Defined Contribution Retirement Wealth for Households with Heads Aged 60+ (2009 US\$)

year	p50	mean	p75	p90	p95
1985	\$0	\$1,871	\$0	\$6,837	\$13,421
1986	\$0	\$2,488	\$0	\$9,643	\$16,869
1987	\$0	\$3,222	\$0	\$13,239	\$21,216
1988	\$0	\$3,974	\$0	\$16,493	\$27,908
1991	\$0	\$6,631	\$1,454	\$24,241	\$46,295
1992	\$0	\$8,004	\$2,353	\$28,239	\$53,654
1993	\$0	\$8,265	\$3,263	\$29,246	\$55,048
1994	\$0	\$9,111	\$3,564	\$32,080	\$60,596
1995	\$0	\$10,308	\$4,853	\$36,037	\$66,625
1997	\$0	\$17,355	\$11,828	\$60,272	\$104,722
1998	\$0	\$18,758	\$14,149	\$65,086	\$111,403
1999	\$0	\$19,661	\$16,052	\$67,379	\$116,526
2002	\$0	\$20,914	\$18,842	\$72,340	\$124,796
2003	\$0	\$22,907	\$22,916	\$78,520	\$130,628
2005	\$0	\$30,620	\$31,307	\$109,545	\$172,161
2006	\$202	\$31,356	\$32,562	\$110,496	\$174,905
2007	\$1,081	\$32,509	\$34,662	\$114,807	\$175,157

Source: SIPP. Retirement wealth is defined as total household equity in IRA/KEOGH accounts and 401K/Thrift Savings Plans.

other real estate, amounts due from the sale of business or property, and other financial assets. To construct a measure of net financial wealth requires excluding secured liabilities (excluding mortgages on owner-occupied homes) and unsecured liabilities, such as credit card debt. For households with negative liquid financial wealth, income is reduced to reflect estimated annual debt service, assuming a nominal interest rate of 9 percent and a repayment period of five years. The level of and trend in the ESI depends only minimally on the assumptions made about the interest rate and repayment period.

The share of those with negative liquid financial wealth fluctuates around 42 percent but displays a slight upward trend over time. However, those who are indebted are increasingly so over time (Table 6). The amount of financial debt for the median indebted household increased more than twofold in real dollars between 1985 and 2007.

TABLE 6

Family-size Adjusted Liquid Financial Wealth for Households with Debt (2009 US\$)

year	p5	p10	p25	mean	p50	p75	p90	p95
1985	-\$24,900	-\$13,458	-\$6,658	-\$6,683	-\$2,824	-\$1,016	-\$298	-\$132
1986	-\$32,086	-\$15,821	-\$7,556	-\$7,426	-\$3,291	-\$1,210	-\$310	-\$135
1987	-\$27,876	-\$15,547	-\$7,993	-\$7,247	-\$3,608	-\$1,217	-\$387	-\$176
1988	-\$34,215	-\$18,135	-\$9,471	-\$8,469	-\$4,275	-\$1,374	-\$447	-\$218
1991	-\$33,812	-\$18,472	-\$9,308	-\$8,219	-\$4,228	-\$1,668	-\$553	-\$275
1992	-\$24,876	-\$17,075	-\$8,283	-\$6,990	-\$3,823	-\$1,367	-\$417	-\$199
1993	-\$27,705	-\$17,619	-\$8,907	-\$7,391	-\$4,023	-\$1,280	-\$413	-\$206
1994	-\$24,402	-\$16,122	-\$8,614	-\$6,911	-\$3,787	-\$1,313	-\$371	-\$162
1995	-\$23,334	-\$15,488	-\$8,547	-\$6,501	-\$3,722	-\$1,302	-\$328	-\$91
1997	-\$26,173	-\$17,891	-\$9,366	-\$7,643	-\$4,499	-\$1,706	-\$534	-\$227
1998	-\$26,846	-\$17,976	-\$9,332	-\$7,740	-\$4,491	-\$1,695	-\$547	-\$234
1999	-\$27,364	-\$18,126	-\$9,389	-\$7,826	-\$4,509	-\$1,702	-\$550	-\$239
2002	-\$31,502	-\$20,832	-\$11,091	-\$9,369	-\$5,365	-\$2,091	-\$682	-\$298
2003	-\$33,198	-\$20,826	-\$11,286	-\$9,464	-\$5,296	-\$2,024	-\$709	-\$330
2005	-\$37,302	-\$24,878	-\$12,713	-\$10,330	-\$5,919	-\$2,109	-\$650	-\$293
2006	-\$35,413	-\$24,893	-\$12,485	-\$9,899	-\$5,734	-\$2,095	-\$637	-\$293
2007	-\$34,541	-\$24,315	-\$12,506	-\$9,861	-\$5,720	-\$2,171	-\$623	-\$266

Source: SIPP. Liquid financial wealth is defined as the sum of interest-earning assets held at financial institutions, other interest-earning assets, regular checking accounts, stocks and mutual fund shares, vacation homes and other real estate, amounts due from the sale of business or property, and other financial assets.

WEALTH BUFFERS

The most important goal of the wealth component of our index is to capture the idea that liquid wealth holdings reduce insecurity. There is no agreement, however, about what counts as “sufficient” wealth to buffer income shocks. Therefore, the ESI employs an empirically based exclusion criterion to calculate how much wealth is needed to replace the income lost after a large drop. Individuals whose wealth equals or exceeds this amount are not counted as insecure even if their income decline meets the 25 percent threshold.

The SIPP panels are too short to track the development of incomes after a large income decline (hereafter, “recovery paths”). The Panel Study of Income Dynamics (PSID), however, permits the calculation of extended recovery paths. Using the PSID data, it is possible to calculate typical (median) recovery paths until the first time an individual who experiences a drop of 25 percent or greater recovers 100 percent of his or her (household-size adjusted, real) pre-drop household income.⁵⁵

These paths begin in the year of a large income drop and continue until individuals return to their pre-drop income (adjusted for inflation). To develop wealth thresholds tailored to specific groups, these calculations were broken down by a set of characteristics (drop tertiles, pre-drop income quintiles, and age groups—further subdivisions are precluded by the relatively small sample size of the PSID). Thus the wealth required to be counted as insecure is tailored to the typical experience of individuals with similar characteristics to the individual experiencing a 25 percent or greater loss.

Three challenges arise, however, in the computation of typical recovery paths. The first is that because of the biennial structure of the PSID, recovery paths can only be observed every other year. The in-between years are filled in with the average of the adjacent values—an approach that turns out to match actual recovery paths quite closely for the years in which annual data are available in the PSID (before 1996).

Second, multiple drops are common. Quite frequently, individuals experience another large income loss during their recovery from a previous drop. To deal with this, each qualifying income loss is treated as a new starting point for a recovery path. Effectively, this means that some individuals show up more than once in the sample of recovery paths. Individuals also often bounce back to their pre-drop income, but then experience further losses. The definition of “recovery” in the ESI counts someone as recovered as soon as they recover the first time to their pre-drop income, even if they later experience a drop that would undo that recovery. This significantly shortens the median recovery path.

An example will clarify the ESI approach. The median recovery path of someone living in a family with a household head aged 35 to 44 years old, having a pre-drop income in the fourth quintile, and experiencing an income drop of 25 percent to 35 percent is shown in Table 7.

In this example, the individual experiences an income drop of 30 percent and then gradually recovers to 100 percent of pre-drop income over the following six years. To fully buffer the lost income, this individual would need to have 101 percent of income in liquid financial wealth to be treated as secure.

Most recovery paths are completed between four and six years, although some groups take longer than that. For analytic tractability, and because long-lived income shortfalls can be thought to necessitate greater adjustment in consumption than short-lived ones, the recovery paths on which the wealth thresholds are based are truncated at six years.

On the one hand, this wealth threshold may be too low, because families that fully deplete their wealth in response to a shock are more vulnerable to hardship during subsequent shocks. Moreover, some families will not return to their pre-drop

TABLE 7

Typical Recovery Path, 25-35 Percent Loss, Individual In Fourth-quintile Household with 35-44 Year-old Head

Time since drop	Percentage of pre-drop income	Required buffer
Year of drop (t)	70%	(100%-70%)=30% of pre-drop income
t+1	75%	(100%-75%)=25% of pre-drop income
t+2	80%	(100%-80%)=20% of pre-drop income
t+3	86%	(100%-86%)=14% of pre-drop income
t+4	92%	(100%-92%)=8% of pre-drop income
t+5	96%	(100%-96%)=4% of pre-drop income
t+6	100%	(100%-100%)=0% of pre-drop income
Cumulative Loss		101% of pre-drop income

Source: PSID.

income within six years, and some will never return. Their arguably disproportionate hardship is not captured by the median loss experience. On the other hand, this wealth threshold may be too high, because households that face permanent changes in their income, rather than transitory shocks, should be expected to reduce their consumption. This is one reason for truncating recovery paths at six years. Still, even if households can and should adjust their consumption, they are nonetheless experiencing a large shock to income that is likely to induce insecurity.

Table 8 displays the ESI with and without the wealth exclusion, as well as the percentage point difference between the two. In 1985, the ESI with the wealth exclusion was 12.2 percent. It would have been 12.9 percent without the wealth exclusion—a difference of 0.7 percentage points. In 2007, the ESI was reduced by 1.1 percentage points because of the wealth exclusion. The wealth exclusion, therefore, has two effects on the ESI. First, it reduces the level of the ESI. Second, it reduces the upward trend of the ESI, since over time a larger share of households appears secure due to their wealth holdings.

TABLE 8**The ESI with and without Buffer (In %)**

	ESI w/ wealth buffer	ESI w/o wealth buffer	Reduction of ESI due to wealth buffer
1985	12.2%	12.9%	0.7%
1986	11.4%	12.3%	0.9%
1987	11.8%	12.5%	0.7%
1988	10.8%	11.8%	1.0%
1991	12.8%	13.6%	0.8%
1992	13.7%	14.6%	0.9%
1993	12.7%	13.7%	1.0%
1994	12.1%	13.0%	0.9%
1995	11.8%	12.5%	0.7%
1997	14.7%	15.8%	1.1%
1998	13.7%	14.9%	1.2%
1999	13.9%	14.9%	1.0%
2002	17.0%	18.2%	1.2%
2003	16.5%	17.7%	1.2%
2005	14.9%	16.0%	1.1%
2006	13.1%	14.2%	1.1%
2007	13.7%	14.8%	1.1%

Source: SIPP. Households have wealth buffers if their liquid financial wealth holdings are greater than the typical loss in income after a large income drop until pre-drop recovery or for six years, whatever comes first.

V. Implications of the ESI for Future Research

The ESI is designed to fill a gap in existing theoretical and empirical analyses of economic security by providing a simple integrated measure of economic security grounded in panel data on economic status. Prior research has focused primarily on individual sources of economic insecurity, such as earnings volatility and the incidence of large medical expenditures. The ESI, by contrast, represents the first attempt to incorporate several key influences—income declines, medical spending shocks, and financial wealth buffers—into a single unified measure.

The ESI is an index of the objective experience of individuals, rather than of their subjective perceptions. Nonetheless, the ESI is designed to embody reasonable judgments about how a typical American would respond to the risks that it tracks. Indeed, its development was crucially aided by survey data specifically collected for this purpose. These polls show that a majority of Americans believe a 25 percent decline in income will cause them hardship.

The ESI shows that Americans are not only facing greater insecurity than at any time within a generation, but also were at heightened risk even before the recent downturn. It also provides a new means of examining the sources of insecurity and the degree to which Americans with different characteristics are vulnerable to those sources. To provide an ongoing measure of American economic security, the ESI will be updated on a regular basis as new data become available.⁵⁶

AN AGENDA FOR FURTHER RESEARCH

Though the ESI was constructed to provide a reliable indicator of economic security consistent with the twin goals of rigor and accessibility, it is by no means an exhaustive measure, and further research to augment and complement it would be valuable.

For example, while the ESI accounts for medical spending, it does not capture other expenses that might be considered nondiscretionary, such as the expenses required to earn income through working (including child-care costs). These costs are generally smaller as a share of income and less variable than MOOP, but examining their impact on fluctuations in available household income would be a natural extension of the ESI.

The ESI also does not capture changes in the probability that individuals will lack adequate retirement income (though other measures of this risk exist and suggest it has increased over time).⁵⁷ The main conceptual obstacle to the incorpora-

tion of retirement income inadequacy into the ESI is the need to measure it on a comparable basis or scale with large short-term losses in available income. It is worth noting, however, that the ESI's treatment of earmarked retirement wealth as unavailable for buffering current income losses incorporates the idea that individuals need to save for retirement and that using retirement savings for current consumption jeopardizes future security.

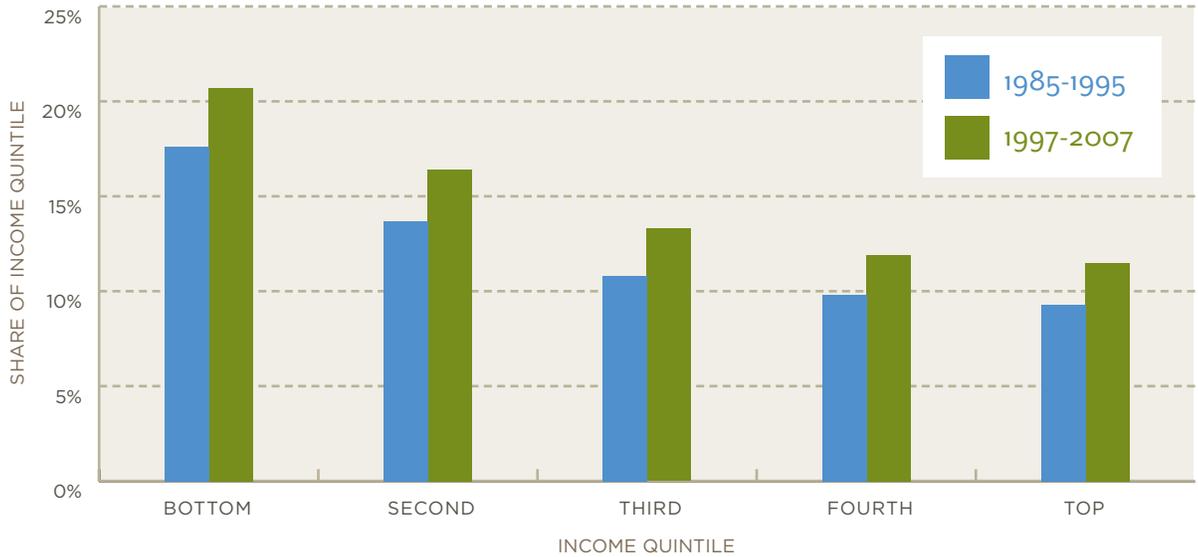
Another area where further research would be fruitful is the impact of wealth changes on economic security. Although the ESI brings wealth holdings into the calculation of economic security, it does not directly capture the gains or losses that families experience as a result of fluctuations in wealth. Indeed, it is unclear how to treat wealth fluctuations in a way that is comparable to income declines, because fluctuations in wealth do not directly affect well-being until the underlying assets are sold. As noted, moreover, it is not possible to track wealth changes reliably with the SIPP data throughout the 1985-2007 period. While the ESI captures the crucial buffering function of wealth in a way consistent with the available data, an improved understanding of the intertwined effects of income and wealth changes on economic security is a worthy goal for future research.

Another research priority is to gain a better understanding of what exactly causes the large income declines reflected in the ESI. To what extent are these causes voluntary (such as planned withdrawal from the labor force to have or raise children) or involuntary (such as job loss due to layoffs or income declines due to earnings changes)? To answer this question precisely requires more detailed analyses of the factors associated with income loss—the subject of a forthcoming report based on the ESI.

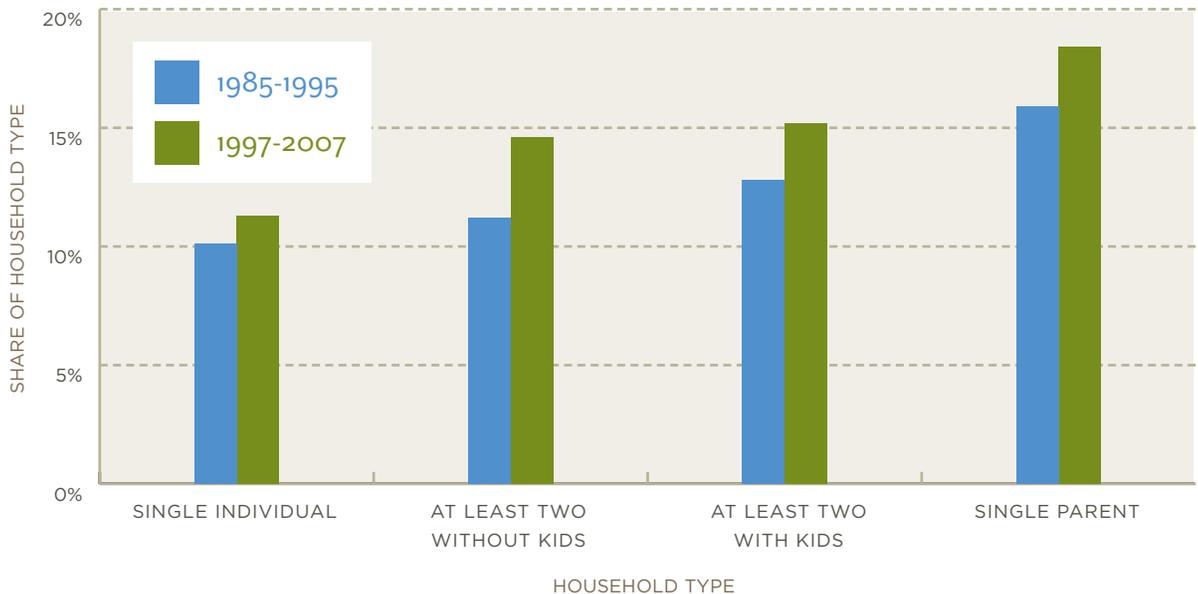
Pending these further analyses, the most that can be said is that the losses measured by the ESI appear to be primarily involuntary. First, the ESI rises and falls with the unemployment rate, suggesting a very central role for involuntary unemployment. Second, by excluding those who accumulate sufficient stocks of financial wealth before an income decline, the ESI treats as secure the individuals whose income losses are most obviously voluntary—namely those who build up financial assets so they can take time off from work. Third, while the ESI has risen at varying rates across different demographic groups, it has risen significantly across all major demographic categories.⁵⁸ If its rise was driven by one set of voluntary behaviors, such as exit of one parent from the labor force for child-rearing in two-parent families, then the rise in income losses would be expected to be concentrated among those able or most likely to engage in such behaviors. Figures 12 and 13—the ESI by income group and the ESI by family type—show that this is not the pattern. Instead, they indicate an increase in the incidence of large income losses across all subgroups, though to varying degrees.

FIGURES 12 & 13

The ESI: Prevalence of Large Economic Losses, by Income Quintile and Period



The ESI: Prevalence of Large Economic Losses, by Household Type and Period



More important, there is good reason to believe that more sharply distinguishing between involuntary and voluntary declines would only affect the *level* of the index, not its *trend*. With regard to the trend in the ESI over time, the crucial question is whether the mix of voluntary and involuntary causes has changed. Although, again, a definitive answer awaits additional research based on the ESI and other sources, there are few reasons to think that the mix of voluntary and involuntary causes has substantially changed since the mid-1980s.⁵⁹ The most likely candidate for a major shift—an increase in the probability of families having

two earners, one of whom cycles in and out of the labor force to have or raise children—cannot, for example, be driving the results outside of two-parent families with children.

One threat to available income tracked by the ESI that falls on the involuntary end of the spectrum—large spikes in MOOP—has certainly increased, according to the ESI. Interestingly, however, while medical spending has increased sharply, the ESI suggests that rising MOOP has not added much to the risk of large income drops over time.

Yet it is important to recognize that the ESI measure of medical spending risk has three limits. First, the focus on out-of-pocket spending (including premiums) means that those who go without necessary medical care or insurance may look more secure than they really are.⁶⁰ Second, the ESI also largely ignores the effects of elevated levels of out-of-pocket medical spending that persist across multiple years, focusing instead on annual changes. This is necessitated by the annual focus of the ESI, but it means that families whose economic security is undermined by persistently high medical expenses may not be treated as insecure. Third, and cutting the other way, the ESI does not account for the ways in which Americans' medical care has become more sophisticated and efficacious, even if more expensive. These three limits are by no means exclusive to the ESI's measure, which reflects the best available data and the latest thinking about how to analyze out-of-pocket medical spending. Designing more sophisticated measures of medical spending risk should be a priority for future analyses.

Research on economic security should also pay special attention to the role of housing in the maintenance of economic security. On the one hand, housing is the main form of wealth held by most Americans, and the ability to tap into home equity to finance current consumption increased in the period leading up to the recent economic downturn. On the other hand, owner-occupied homes have substantial use value: being forced to sell a home after a job loss would, by most definitions, constitute a form of insecurity. Nor is it likely that those who lose a job or experience large MOOP shocks could easily extract large sums from their home by taking on additional debt. And, as the recent financial crisis reveals, housing debt constrains family finances just as other forms of debt do, creating the risk of delinquency, impairment of access to credit, and property loss.

Given the ambiguous role of housing as a short-term safety net, the ESI does not include housing wealth (or debt) in its measure of liquid financial wealth available to buffer large income losses. Nonetheless, to assess the effect of incorporating housing wealth into the index, the ESI was recalculated with owner-occupied home equity treated as a source of additional income (much like a retirement annuity) over the course of a house's mortgage. The idea is that rising home values

provide families with a means of consuming at a higher level than their income alone would allow—a treatment congruent with the way in which economic analyses of recent years have studied the consumption effects of housing wealth.⁶¹ This sensitivity analysis showed that the ESI is only modestly reduced by the inclusion of housing wealth over the 1985-2007 period. This potentially surprising finding reflects the reality that housing debt rose roughly in tandem with housing wealth over this period. Of course, if housing wealth were incorporated into the calculation of the ESI, the spike in economic insecurity would be even higher in the current period, given the large drop in home prices and the rising prevalence of negative homeowner equity that has occurred in the last three years.

Future reports based on the ESI will take up a number of these issues as well as others, including how different segments of American society and parts of the nation have fared; the specific causes, persistence, and severity of household income declines; and how levels of and trends in economic security differ across selected affluent nations. To better understand the relationship between the events measured in the ESI and the subjective experience of economic insecurity, the Rockefeller Foundation has supported a linked project to examine what shapes people’s perceptions of economic insecurity. Some of the results from the first wave of this survey—conducted in conjunction with the American National Election Studies—have been discussed in this report. Additional research based on these opinion data will allow for better understanding of how people’s perceptions of economic security are linked to their real economic experiences.

A UNIQUE TOOL FOR RESEARCH, EDUCATION, AND DISCUSSION

Ultimately, no single measure can capture all aspects of economic security. But the ESI represents a tool for capturing three of the most important aspects: large household income losses, large spikes in out-of-pocket medical spending, and inadequate liquid financial wealth to buffer the effects of the first two threats. It provides a baseline for researchers to expand the concept of economic security beyond its existing scope, which is defined by relatively narrow aspects of well-being. It also provides a tool for those interested in identifying which segments of American society are least secure and why. And it provides a framework for evaluating the effects of public and private policies among these vulnerable groups and Americans as a whole. In short, the ESI is a foundation for understanding and action on which researchers and policymakers alike can build.

Notes

1 Scholars in an array of disciplines—from economics and political science to social psychology and sociology—have demonstrated the impact of income instability (e.g., Austin Nichols, *Trends in Income Inequality, Volatility, and Mobility Risk: Via Intertemporal Variability Decompositions* (Washington, DC: The Urban Institute); Jacob S. Hacker, *The Great Risk Shift: The New Economic Insecurity and the Decline of the American Dream*, rev. and exp. ed. (New York: Oxford University Press, 2008) and perceived insecurity on individual well-being (e.g., Talya Miron-Shatz, “Am I Going to Be Happy and Financially Stable?” *How American Women Feel When They Think About Financial Security*,” *Judgment and Decision Making* 4, no. 1 (2009):102–112; Carol Graham and Stefano Pettinato, *Happiness and Hardship: Opportunity and Insecurity in New Market Economies* (Washington, DC: The Brookings Institution Press, 2002); Alex C. Michalos, P. Maurine Hatch, Dawn Hemingway, Loraine Lavalley, Anne Hogan, and Bev Christensen, “Health and Quality of Life of Older People, a Replication After Six Years,” *Social Indicators Research, Springer Science+Business Media B.V.* 2007), labor market behaviors (e.g., Melvin Stephens, “Worker Displacement and the Added Worker Effect,” *Journal of Labor Economics* 20, no. 3 (2002):504–537), savings aspirations (e.g., Austin Nichols and Melissa M. Favreault, *The Impact of Changing Earnings Volatility on Retirement Wealth* (Washington, DC: Urban Institute; March 2009); Christopher D. Carroll, Karen E. Dynan, and Spencer D. Krane, “Unemployment Risk and Precautionary Wealth: Evidence from Households’ Balance Sheets,” *Review of Economics and Statistics* 85, no. 3 (2003):586–604), and political attitudes (e.g., Philipp Rehm, “Risks and Redistribution: An Individual-Level Analysis,” *Comparative Political Studies* 42, no. 7 (2009): 855–881; Thomas Cusack, Torben Iversen, and Philipp Rehm, “Risks at Work: The Demand and Supply Sides of Government Redistribution,” *Oxford Review Economic Policy* 22, no. 3 (2006):365–389; Anthony Mughan and Dean Lacy, “Economic Performance, Job Insecurity and Electoral Choice,” *British Journal of Political Science* 32, no. 3 (2002): 513–553).

2 See Daniel Kahneman, Jack L. Knetsch, and Richard H. Thaler, “Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias,” *Journal of Economic Perspectives* 5, no. 1 (1991): 193–206; Liliana Winkelman and Ranier Winkelman, “Why Are the Unemployed So Unhappy? Evidence from Panel Data,” *Economica* 65 (1998):1–151; Ethan Ligon and Laura Schechter, “Measuring Vulnerability,” *Economic Journal* 113, no. 486 (2003): C95–C102; Roland Bénabou and Efe A. Ok, “Social Mobility and the Demand for Redistribution: The POUM Hypothesis,” *Quarterly Journal of Economics* 116 (2001):447–487; Jonas Agell, “On the Benefits from Rigid Labour Markets: Norms, Market Failures, and Social Insurance,” *Economic Journal* 109, no. 453 (1999): 143–164.

3 For a sense of the disagreements, see Steven J. Davis, “The Decline of Job Loss and Why It Matters,” University of Chicago, NBER and AEI, 3 January 2008, prepared for the ASSA Meetings in New Orleans; Melvin Stephens, “The Long-Run Consumption Effects of Earnings Shocks,” *Review of Economics and Statistics* 83, no. 1 (2001): 28–36; and Jonathan Gruber, “The Wealth of the Unemployed,” *Industrial and Labor Relations Review* 55, no. 1 (2001): 79–94.

4 This approach was adopted to avoid basing the ESI on potentially biased individual perceptions of the likelihood or expected effects of economic risks. (See, e.g., Charles F. Manski, “Measuring Expectations,” *Econometrica* 72, no. 5 (2004):1329–1376; Ligon and Schechter, “Measuring Vulnerability.”) While this strategy has considerable merits, one important implication of it is that the number of households that are labeled as “insecure” in the ESI can be expected to understate the prevalence of Americans’ concerns about economic insecurity as measured in surveys. This is not speculation: As part of the development of the ESI, the Rockefeller Foundation funded a parallel research effort to assess Americans’ perceptions of economic security using a new set of opinion polls embedded in the American National Election Studies. These polls show that, across a range of salient economic risks, expressed worry about a given risk is more prevalent than actual experience of that risk in a given year. For instance, a third of the working public reported being “somewhat worried” or “very worried” about losing their job in the spring of 2009, though only 32 percent expressing such fears had actually experienced any unemployment in their household in the previous year.

5 Nor does the loss measure take into account prior drops (or increases) in income. It is a year-to-year measure. When an individual experiences a large drop in household income, this new income level becomes the base from which annual income changes are calculated in subsequent years. The same is true in reverse: Individuals may experience large income declines because in the prior year they experienced a large income rise and are now returning to their normal income level. Fortunately for interpreting the over-time trend in the index, the share of those experiencing income declines after positive income shocks has remained relatively stable over time.

6 Sara R. Collins, Jennifer L. Kriss, Michelle M. Doty, and Sheila D. Rustgi, *Losing Ground: How the Loss of Adequate Health Insurance Is Burdening Working Families* (New York: Commonwealth Fund, 2008); Karen E. Dynan and Donald L. Kohn, “The Rise in U.S. Household Indebtedness: Causes and Consequences,” Discussion Paper, 2007–37, Finance and Economics Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board (Washington, DC); David Kusnet, Lawrence Mishel, and Ruy Teixeira, *Talking Past Each Other: What Everyday Americans Really Think (and Elites Don’t Get) About the Economy* (Washington, DC: Economic Policy Institute, 2006).

7 Constance F. Citro and Robert T. Michael, eds. *Measuring Poverty: A New Approach*. (Washington, DC: The National Academies Press, 1995); see also Gary Burtless and Sarah Siegel, “Medical Spending, Health Insurance, and Measurement of American Poverty,” (Washington, DC: The Brookings Institution, August 2001). www.brookings.edu/reports/2001/08useconomics_burtless.aspx.

8 Stephens, “Worker Displacement and the Added Worker Effect;” Paul Attewell, “The Impact of Family on Job Displacement and Recovery,” *Annals of the American Academy of Political and Social Science* 562 (1999):66–82; Kathryn Edin and Laura Lein, *Making Ends Meet: How Single Mothers Survive Welfare and Low-Wage Work* (New York: Russell Sage Foundation, 1997). Risk buffering within the nuclear family/household does not take into account the extensive income

transfers that occur within extended families. In the ANES survey, roughly 20 percent of all respondents reported making a substantial financial payment to help out a member of their extended family. When asked if they could borrow money from their extended family to meet essential household expenditures, 54 percent indicated that they could, with a median expectation for the largest amount that could be borrowed about \$10,000.

9 The main effect on the ESI of these latter two adjustments comes through their alteration of the income “base” from which large drops occur. By increasing (annuity) or decreasing (debt service) income, these two adjustments make drops of a given absolute magnitude smaller or larger as a share of income, respectively.

10 The NAS recommended equivalence scale is [(# of adults) + 0.7*(number of children)]^{0.7}, where adulthood is defined as age 18 and up. Citro and Michael, *Measuring Poverty*.

11 Tullio Japelli and Luigi Pistaferri, “The Consumption Response to Income Changes,” *Annual Review of Economics* 2 (August 2010); Ed Diener, Richard Lucas, and Christie Napa Scolon, “Beyond the Hedonic Treadmill: Revising the Adaptation Theory of Well-Being,” *American Psychologist* 51 (2006):305–14; Ligon and Schechter, “Measuring Vulnerability.”

12 See Japelli and Pistaferri, 2010; Stephens, “The Long-Run Consumption Effects of Earnings Shocks.”

13 However, the exact timing of retirement is frequently influenced by factors that are not as easily anticipated, such as job loss and changes in health status, and there remains dispute about exactly how large a share of pre-retirement income individuals need in retirement.

14 In September 2009, the survey asked a representative cross-section of Americans about any significant drops in income experienced since January 2008. Counting only those drops that equaled or exceeded 25 percent of previous year’s income, the annualized rate for income declines of this size was 19.4 percent over this time period. Note that this does not include the impact on economic security associated with large medical expenses or debt service. If one focuses on the projection of the component of the ESI that involves only income drops, the projected prevalence for 2009 was 18.5 percent, slightly lower than our survey estimates of income declines of this magnitude.

15 In addition, as Table 1 shows, those who experience at least a one-quarter drop in their available income are also falling farther than in the past. In 1985, the typical (or “median”) loss for someone with an available income decline of at least 25 percent was 39 percent of their previous year’s income. In 2007, it was almost 42 percent. The rising size of typical drops for those experiencing available income declines of 25 percent or larger addresses the potential worry that the ESI is going up because more people are “just clearing” the 25 percent loss threshold. Instead, median drops among those who exceed the threshold are in fact slightly larger than in the past.

16 The PSID includes a special sample of low-income respondents, which we incorporated into the analyses using appropriate survey weights.

17 Because the SIPP consists of a series of panels stretching two to four years, with inconsistent availability and overlap over our complete sample frame, it is impossible to estimate ESI for some years between 1985 and 2007—specifically, 1989, 1990, 1996, 2000, 2001, and 2004. In the figures, these years are simply filled in through linear interpolation (that is, by assuming linear change between adjacent years for which ESI estimates are available).

18 The survey is divided into a core portion that is conducted in each wave and supplementary “topical modules” that are conducted with varying periodicity (once yearly beginning in 1996 for numerous modules). The core survey collects information on basic characteristics of the sample households and the individuals who live in them, including income. The topical modules provide substantial additional details on specific aspects of well-being and participation in government programs. See the complete list at www.census.gov/sipp/top_mod/top_mods_chart.html.

19 We used the “longitudinal full panel files” where available. This enhances the comparability of the panels over time by imposing relatively consistent data editing procedures across all the panels (e.g., by incorporating data edits that are performed after multiple waves of data are completed and imposing logical consistency in selected responses over time).

20 These cuts also eliminated all topical modules.

21 Analyses of SIPP income data indicate that they generally understate income amounts obtained from other household surveys conducted by the Census Bureau, notably the Annual Demographic Supplement to the monthly Current Population Survey (the March CPS). The exception is low-income groups, for which the SIPP survey is especially well-designed to elicit information on income sources (e.g., government programs); as such, poverty rates estimated from the SIPP fall noticeably below the official rates calculated from the March CPS. (See the discussion in Constance Citro and John Karl Scholz, eds., *Reengineering the Survey of Income and Program Participation* (Washington, DC: The National Academies Press, 2009), especially the data quality appendix.)

22 The Congressional Budget Office has calculated that the average effective federal tax rate, accounting for the EITC, has remained virtually constant since the mid-1980s, when the ESI begins. “Historical Effective Federal Tax Rates: 1976–2006,” (Washington, DC: Congressional Budget Office, 2009); www.cbo.gov/ftpdocs/100xx/doc10068/effective_tax_rates_2006.pdf. Additionally, over the same period, state and local taxes, which are less progressive than federal taxes, have risen as a share of income.

23 This process is referred to as “attrition.” Cumulative attrition rates in the SIPP panels range from about 20–35 percent (SIPP User’s Manual 2001, pages 2–18).

24 Congressional Budget Office “Recent Trends in the Variability of Individual Earnings and Household Income,” (Washington, DC: CBO, June 2008); data at www.ssa.gov/policy/docs/ssb/v65nlp63.html.

25 See the U.S. Census Bureau. Survey of Income and Program Participation (SIPP) *User’s Guide* 2001, chapter 4;

also Patricia J. Fisher, “Assessing the Effect of Allocated Data on the Estimated Value of Total Household Income in the Survey of Income and Program Participation,” SIPP Working Paper No. 244 (Washington, DC: 2006).

26 A small number of “logical” imputations are also applied, which fill in missing income values based on the reported values of other key variables; we treat these imputed values in the same manner as longitudinal imputations.

27 Dropping observations with any months of hot-deck imputation represents a conservative approach to the treatment of imputation, for two reasons: (1) some of these observations have only a few months imputed out of the 12 used to construct annual income and hence reflect a limited influence of imputation; (2) it is likely that observations with imputed income values have higher underlying volatility from year to year than do non-imputed observations, because the non-response that requires imputation is likely to reflect uncertainty or volatility with respect to household income components. In other words, it is likely that observations with imputed values have intrinsically (rather than spuriously) higher income volatility than do observations that are not imputed.

28 Although receipt of social security is not guaranteed to capture the timing of full retirement in a household, more direct measures of individual retirement status are not consistently available over the complete SIPP sample frame.

29 The regression results are listed here, where U represents the annual unemployment rate, dU is its change, dQ is the percentage change in the annual value of real GDP, and T is the time trend; standard errors are listed in parentheses under the estimated coefficients, and the subscripts indicate time periods:

$$ESI_t = 0.055 + 0.0052U_{t-1} + 0.024dU_t + 0.737dQ_t + 0.0022T \\ (0.033) (0.0040) (0.0056)** (0.279)* (0.0005)**$$

Number of observations=17, adjusted $R^2=0.711$

*, ** = coefficients significant at the 5 percent and 1 percent levels, respectively

30 Patricia Andreski, Frank Stafford, and Wei-Jun Yeung, “Assessing the PSID t-2 Income Data,” PSID Technical Paper Series #08-06; <http://psidonline.isr.umich.edu/Guide/Quality/PSID%20t-2%20report.pdf>.

31 For a comparison of the characteristics of the SIPP and PSID, see Citro and Michael, eds., *Measuring Poverty*, Appendix B.

32 However, the spike in large income drops during the early to mid-1990s must be viewed with some suspicion due to its coincidence with major administrative changes in the PSID during this period. For most of the PSID’s history, the income reports in the PSID closely match those in other respected datasets, including the Census Bureau’s Current Population Survey. However, the PSID departs from the CPS at the bottom of the income distribution for roughly five years in the mid-1990s. During this time, the lowest income categories in the PSID have lower average incomes than seen in other datasets and the overall variance of the PSID income data jumps. Nonetheless, even excluding the early to mid-1990s data from consideration, there is a clear upward trend in large income losses.

33 Karen Dynan, “The Income Roller Coaster: Rising Income Volatility and Its Implications,” (Washington, DC: Brookings Institution, April 2010); www.brookings.edu/articles/2010/0401_income_volatility_dynan.aspx.

34 See Brett O’Hara, “Do Medical Out-of-Pocket Expenses Thrust Families into Poverty?” *Journal of Health Care for the Poor and Underserved* 15 (2004):63–75.

35 Formally, CEX consumer units include (1) all members of a particular housing unit who are related by blood, marriage, adoption, or some other legal arrangement, such as foster parenthood; (2) a person living alone or sharing a household with others, or living as a roomer in a private home, lodging house, or in permanent living quarters in a hotel or motel, but who is financially independent; and (3) two or more unrelated persons living together who pool their income to make joint expenditure decisions.

36 Complete income reporters are not exhaustive reporters, rather they are consumer units deemed to have provided information for at least one of the major sources of their income, such as wages and salaries, self-employment income, or retirement income.

37 Raphael Branch, “The Consumer Expenditure Survey: A Comparative Analysis,” *Monthly Labor Review* (December 1994): 47–55; Gregory Acs and John Sabelhaus, “Trends in Out-of-Pocket Health Expenditures, 1980–1992,” *Monthly Labor Review* 118 (1995):12.

38 In a similar vein, see Thesia Garner et al., “The CE and the PCE: A Comparison,” *Monthly Labor Review* (September 2006): 20–46.

39 See David Betson, “Imputing Medical Out-of-Pocket Expenditures from NMES Data.” Unpublished manuscript, University of Notre Dame, December 1997; and “In Search of an Elusive Truth, How Much Do Americans Spend on Their Health Care?” Unpublished manuscript, University of Notre Dame, 7 April 1997.

40 Branch, “The Consumer Expenditure Survey.”

41 David Johnson, Timothy Smeeding, and Barbara Boyle Torrey, “Economic Inequality Through the Prisms of Income and Consumption,” *Monthly Labor Review*, April (2005): 22–24.

42 If we examine medians instead of means, these groups have also experienced declines. Additionally, households headed by someone 18–34 have experienced median MOOP declines for the lowest two income quintiles and households headed by someone 65–74 in the lowest income quintile have had median (but not mean) declines in spending as a proportion of income.

43 Acs and Sabelhaus 1995, find a similar change in out-of-pocket spending in the early 1990s.

44 Jessica S. Banthin, Peter Cunningham and Didem M. Bernard, “Financial Burden of Health Care, 2001–2004,” *Health Affairs* 27, no.1 (2008): 188–195.

45 Peter J. Cunningham, “The Growing Financial Burden of Health Care: National and State Trends, 2001–2006,” *Health Affairs* 29, no.5 (2010): 1037–1044.

46 For an alternative approach that relies on taking a higher order logarithmic transformation of MOOP—and not MOOP as proportion of income—see David Betson, “Imputation of Medical Out-Of-Pocket (MOOP) Spending to CPS Records” (Washington, DC: U.S. Department of Commerce, Bureau of the Census, 2001). Our approach avoids certain problems identified by Betson caused by

differences in the variance and mean of spending across age and income groups.

47 We find much higher proportions of families spending \$0 (or less than \$100 per NAS equivalent person in 2000 USD) on MOOP in the SIPP than in the CEX for identical years, a result we attribute to the CEX's advantages as a measure of consumer behavior and the confluence of non-reporting and misreporting in the SIPP's annual retrospective questions about MOOP. (We find similar results if we examine MOOP as a proportion of income.) For this reason, we adjust downward the proportion of families reporting no MOOP spending in the SIPP to match that observed in the CEX by randomly discarding an appropriate proportion of \$0 households in each of the 6 age groups and 15 income groupings within those age groups. This discarding of \$0 MOOP observations to match their prevalence in the CEX is appropriate if \$0 observations are in fact drawn from the entire distribution of MOOP spending (rather than representing lower levels that are misremembered as \$0).

48 Note that such a process will not account for changes in average spending variability over time, but it should not exacerbate it.

49 We have experimented with trying to simultaneously impute insurance coverage and MOOP, but the problem we face is that the biggest changes in insurance coverage in recent years have been the expansion of insurance to low income families that previously either did not have coverage or had private coverage. We therefore lack a clear empirical strategy for estimating (prior to recent years of the SIPP) exactly which families, conditioning on observed MOOP, did or did not have insurance.

50 Jonathan Gruber, "Health Insurance and the Labor Market," in *The Handbook of Health Economics*, eds., J. Newhouse, A. Culyer, 645-706 (Amsterdam: Elsevier, 2000).

51 The BLS data can be obtained at www.bls.gov/nchs/ect/ and the MEPS data at www.meps.ahrq.gov/mepsweb/data_stats/MEPSnetIC.jsp; for the latter, we averaged employer contributions for single-coverage and family plans. The 6 percent figure errs on the generous side with respect to the value of employer contributions to EPHI for a typical household: households with multiple employed individuals typically receive EPHI from only one employer, implying that the share of EPHI value in total household wages is less than the share of individual wages.

52 See Alfred Gottschalk, "Net Worth and the Assets of Households: 2002," U.S. Census Bureau, Current Population Reports P70-115 (Washington, DC: US Government Printing Office, 2008) for discussion of the features and detailed uses of these data; and Constance F. Citro and John Karl Scholz, eds., *Reengineering the Survey of Income and Program Participation: Panel on the Census Bureau's Reengineered Survey of Income and Program Participation* (Washington, DC: National Academies Press, 2009), for discussion of their shortcomings. Wealth data in the SIPP are known to substantially underestimate the aggregate wealth in the United States, primarily because the sample and survey design are inadequate to fully elicit and account for wealth holdings among households near the top of the distribution. Underreporting of this nature is unlikely to have much impact on the ESI because our use of wealth is limited to amounts well below those that are near the top of the distribution.

53 To avoid the influence of outliers, all wealth variables are also top- and bottom-coded at each year's p1 and p99, respectively.

54 The annuity amount is calculated as follows:

$$\text{Annuity} = \text{retirement savings} * \frac{r}{1-(1+r)^t}$$

where:

• retirement savings are defined as mentioned above

• r: nominal interest rate, here 0.03

• t: average life expectancy of household head and wife, based on (black vs. white and others), gender, and, of course, age

The source of these data is [ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/Health_US/hus08tables/table026.xls](http://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/Health_US/hus08tables/table026.xls). A PDF-version can be found here: www.cdc.gov/nchs/fastats/lifexpec.htm (Table 26, p. 201). Since there are no life-expectancy data for 2007, we simply used the 2006 data for that year.

55 We use PSID data from 1985-2007. Due to its bi-annual structure since 1997, all calculations are based on two-year changes. For the recovery path analysis, intermediate years are simply the averages of the adjacent years. Moreover, in the PSID we look at pure income drops and only adjust for retirement entry (i.e., we do not adjust for MOOP expenditures, debt service, retirement annuities, or wealth buffers).

56 A new SIPP panel was initiated in late 2008, with a sample of about 45,000 households (similar to the initial 2004 panel prior to spending cuts in 2006) and plans for a complete range of data collection, including medical spending and wealth. Given the requirement of multiple years of SIPP data (at least 6 waves) to construct the ESI, the data necessary to conduct the next update of ESI values (which will correspond to calendar years 2009-2010) are expected to become available in May 2011. Further information can be found at www.census.gov/sipp/DEWS/2004Schedule.pdf.

57 See in particular Alicia Munnell's work at the Center for Retirement Research at Boston College, http://crr.bc.edu/director/alicia_h._munnell_2.html.

58 A series of tests were conducted to assess whether differences across demographic groups (separately defined by age, education, ethnicity, and family type) and over time were statistically significant on their own and controlling for other factors. With the exception of Hispanics, all groups saw a statistically significant rise in economic insecurity between 1985-1995 and 1997-2007. With only a few trivial exceptions, all groups are also statistically distinct from each other. Finally, almost all demographic groups are statistically distinct even when controlling for income, with the main exception being educational groups, because educational attainment is highly correlated with income.

59 See, for example, Dynan, "The Income Roller Coaster," in which the author reports "voluntary choices are not the dominant force behind increasing household income volatility."

60 Analyses using the Medical Expenditure Panel Survey and its precursors that were done in conjunction with preparation of ESI indicate that the relationship between insurance and medical spending has changed since the late 1970s. At that time, the uninsured spent more out-of-pocket on medical care; in the last two decades, they have spent less than the insured, suggesting that they are more likely to forgo care than in the past. Our own analyses of out-of-pocket medical spending in the SIPP indicate that family MOOP

spending drops when families lose income, though not enough to prevent the share of income spent on medical care from rising. It may be that postponing care is a private means of dealing with income fluctuations; if so, it can threaten economic insecurity, not to mention health, down the line. A forthcoming ESI brief on medical spending will examine this important issue in depth.

61 Karl Case, John Quigley, and Robert Shiller, "Comparing Wealth Effects: The Stock Market versus the Housing Market," *Advances in Macroeconomics* 5 (2005):1-34; Christopher Carroll, Misuzu Otsuka, and Jirka Slacalek, "How Large Is the Housing Wealth Effect? A New Approach," NBER Working Paper 12746 (Cambridge, MA: National Bureau of Economic Research, 2006); Raphael Bostic, Stuart Gabriel, and Gary Painter, "Housing Wealth, Financial Wealth, and Consumption: New Evidence from Micro Data," *Regional Science and Urban Economics* 39, 1 (2009):79-89. For an alternative view (very small housing wealth effects on consumption), Charles Calomiris, Stanley Longhofer, and William Miles, "The (Mythical?) Housing Wealth Effect," NBER Working Paper 15075 (Cambridge, MA: National Bureau of Economic Research, 2009).

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