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# MEASURING HEALTH INSURANCE BENEFITS: THE CASE OF PEOPLE WITH DISABILITIES

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## ABSTRACT

Since 2012 the Congressional Budget Office has included an estimate of the market value of government-provided health insurance coverage in its measures of household income. We follow this practice for both public and private health insurance to capture the impact of greater access to government-provided health insurance for working-age people with disabilities, whose value rose in 2010 dollars from $11.7B in 1980 to $114.3B in 2012. We then consider the more general implications of incorporating estimates of the market price of insurance, equivalent to that provided by the government, into policy analyses in a post-Affordable Care Act world.

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Since 2012 the Congressional Budget Office (CBO) has included an estimate of the market value of government-provided health insurance coverage in its measure of household income to more fully identify how government taxes and expenditures (transfers) are distributed across the income distribution (CBO 2012). However, there is considerable debate in the academic literature over the importance of including the market value of health insurance (i.e., the cost to employers and government of providing health insurance) in measures of income and its distribution. (See Burkhauser, Larrimore and Simon 2013, for a discussion of this debate.)

A small academic literature shows that the inclusion of the market value of health insurance will primarily affect U.S. income levels but have a smaller effect on their trends except at the bottom tail of the distribution (Burtless and Svaton 2010; Burkhauser, Larrimore and Simon 2013; Burtless and Milusheva 2013; Sommers and Oellerich 2013; Armour, Burkhauser, and Larrimore 2014).

While this may be the case for the general population, the treatment of health insurance may be much more important for some populations with respect to their levels and trends in income and its distribution. Here we focus on one such population—working-age people with self-reported work activity limitations (i.e., working-age people with disabilities). In doing so, we follow the current CBO treatment of health insurance and define the market value of government-provided health insurance based on the Census Bureau's imputed values for the average program cost of Medicare and Medicaid. We define the market value of employer contributions to their workers' health insurance premiums in the same way using Census Bureau values. These estimates reflect the additional market price the individual would pay for this health insurance in the private market. Using this approach to valuing health insurance, we demonstrate that by adding the market value of both private and public health insurance to our

measure of income, we can now capture the impact on these individuals of increased access to health insurance resources from 1980 through 2012. This, in turn, greatly affects the observed income levels of individuals with disabilities, both absolutely and relative to the rest of the working-age population. Using our findings as an example, we then consider the more general implications of valuing health insurance at its market value on policy analyses in a post-Affordable Care Act (ACA) world.

The working-age population with disabilities that we focus on in this paper is important both as a share of the overall population (8.2% of working-age adults reported having a work activity limitation in 2011) and as a share of government expenditures. Using aggregate expenditures, Livermore, Stapleton, and O'Toole (2011) document that 12% of all federal government expenditures focused on working-age people with disabilities in 2008. This amounted to $357.3 billion, an increase of 30.6% in real terms from 2002. Federal health care expenditures (primarily Medicare and Medicaid) made up $169.1 billion of these expenditures (47.3% of the total) in 2008, nearly equaling the $169.8 billion going towards income maintenance expenditures (primarily Social Security Disability Insurance (DI) and Supplemental Security Insurance (SSI)). Livermore et al. (2011) warn that "given the size and rapid growth of spending under current law, it will be very difficult for policy makers to avoid making the population of working-age people with disabilities the target of efforts to reduce federal deficits" (p. 1664).

In Figure 1 we provide a first look at the potential importance of capturing the market value of Medicare and Medicaid (measured in 2010 dollars) in a measure of income for working-age people with disabilities. Using individual-level data from the Current Population Survey for income years 1980 through 2012 we capture the total value of DI and SSI cash benefits received

by working-age people with disabilities and their households. We then compare the values of these DI and SSI cash benefits, which are included in standard measures of government transfers, with the total market value of Medicare and Medicaid received by working-age people with disabilities and their households through the DI and SSI programs, which is not generally captured in standard measures of government transfers.

There has been substantial growth in the cost of both these cash transfers (DI and SSI) and Public Health Insurance (Medicare and Medicaid) since 1980, but much more so for Medicare and Medicaid so that its share in the total of these two types of government transfers has increased from 23.29% ($11.7 Billion) in 1980 to 53.15% ($114.3 Billion) in 2012.[1]

Figure 2 (Panel A) shows that the growth in DI and SSI benefits (measured in 2010 dollars) received by working-age people with disabilities over the 1982 to 2012 period was in part caused by substantial increases in the take-up rates of those receiving either DI or SSI benefits or both. Take-up rates (based on three-year moving averages with 1982 being the mean value of 1980-1982) increased from 28% in 1982 to 49% in 2012.[2] Employer-provided health insurance coverage (Private HI) declined substantially for working-age people with disabilities as their employment declined over this period, but this decline was more than offset by the rise in their access to government-provided Medicare and Medicaid coverage (Public HI) either via DI or SSI or other federal government programs. There was an increase in dual eligibles (persons

[1] While our aggregate values are somewhat different from those Livermore et al. (2011) report, our trends are similar, and, more importantly, because our aggregate values come from individual record files we are able to show how these benefits are distributed across the income distribution. See the Appendix for a fuller discussion of the differences in our estimation methods and those of Livermore et al. (2011).

[2] This increase in take-up rates explains 23% of the increase in disability-based transfer spending we observe in Figure 1. See the Appendix for a fuller discussion of how we arrive at this number.

covered by both Medicare and Medicaid) as well. As a result the share of working-age people with disabilities who are uninsured fell from 25.5% in 1982 to 14.9% in 2012.[3]

Figure 2 (Panel B) shows that not including the market value of health insurance will also miss its growing resource value to working-age people with disabilities who have this coverage. It reports the median market value to recipients in this population of private employer-provided health insurance (Private HI) as well as Medicare, Medicaid, and the combined market value to those covered by both these government-provided programs (dual eligibles). In the working-age population with disabilities, the median market value of government health benefits for those receiving them now exceeds the median cash value of DI and/or SSI benefits for those receiving them. Furthermore, these median health insurance values far exceed the median employer contribution to employer-provided health insurance to those it covers.

Measures of income that do not include this resource will not only miss the growth in access to health insurance and its market value to those covered by this insurance but will also greatly understate the role that government-provided transfers (both in-cash and in-kind) play in increasing the resources available to working-age people with disabilities. This is the case in absolute terms and also relative to working-age people without disabilities. (See Figure1A in the Appendix for the equivalent trends in insurance coverage and the value of that insurance for working-age adults without disabilities. It shows that they did not experience the same level of increase as seen in Figure 2 for those with disabilities.)

[3] Over this period the share of uninsured working-aged people without disabilities fell from 20.7% in 1982 to a low of 15.6% in 1989 before slowly rising to a high of 21.9% in 2012. See the Appendix for a fuller discussion of how we arrive at this number which are reported in Figure 1A.

## I. DATA

We explore the impact of including the market value of health insurance and other government transfers on the trends in economic resources of people with and without disabilities by comparing four alternative measures of income in the economics literature. We do so with the public-use March Current Population Survey (CPS) for income years 1980 to 2012 and supplement it with cell-means for top-coded incomes from Larrimore et al. (2008). The CPS includes Census Bureau estimates of the market value of employer- and government-provided health insurance, which we use in our analysis of CPS household income data. The CPS is the only data set that provides consistent information on the economic resources of persons with disabilities since 1981 (income year 1980).

### Identification of Working-Age Persons with Disabilities

We focus on working-age (aged 18 to 64) people who report having a work activity limitation. Respondents are asked if they have a health problem or disability which prevents work or which limits the kind or amount of work. Although researchers should be cautious when using any self-reported measure, previous research has shown that this work activity question represents a good proxy for disability status. Benítez-Silva et al. (2004) find that self-reported work limitation responses are an unbiased indicator of DI eligibility decisions and Stern (1989) finds that the measure is close to exogenous. Bound and Burkhauser (1999) find that this measure identifies populations with substantial differences in health status. Burkhauser et al. (2002) argue that the CPS can be reliably used to monitor trends in the outcomes of those with disabilities using the self-reported work limitation indicator. Burkhauser, Houtenville, and Tennant (2014) argue that including responses to a work limitation question with those from the minimum six-question sequence standard for capturing the population with disabilities

(established by the U.S. Department of Health and Human Services within the Affordable Care Act of 2010) would better capture those receiving DI and disability-related SSI benefits in the CPS data than the six-question sequence alone.

Income

Market income (definition 1) includes cash income from all private income sources. Piketty and Saez (2003) and others in the top income literature use this measure of income but do so primarily with income tax records data (See: Atkinson, Piketty, and Saez 2011, for a review of this literature).

The second measure is market and cash transfer income (definition 2), which includes cash income from all private and government sources in the CPS. This was the most commonly used income measure through the early 2000s. (See: Atkinson and Brandolini 2001 and Gottschalk and Smeeding 1997, for early reviews of this literature.) For more recent examples, see Gottschalk and Danziger (2005), Daly and Valletta (2006), and Blank (2011). It continues to be used by the Census Bureau (DeNavas-Walt and Proctor 2014) and for those tracking the resources available to those with and without disability (See for example: Houtenville et al. 2009; Burkhauser and Daly 2011; and Stapleton 2011).

The third measure (definition 3) is disposable income, which includes cash income from all private and government sources in the CPS plus some in-kind transfers (SNAP, housing subsidies, and school lunches) as well as tax credits minus federal and state income taxes. The CBO (2011) used a conceptually similar measure of income prior to 2012.[4] A disposable income measure is also preferred by the OECD (d'Ercole and Förster 2012) in its international studies of income. In constructing this measure, the Census Bureau imputes the market value of SNAP

[4] Prior to 2012, the CBO used an income measure which included the Census' estimated fungible value of Medicare and Medicaid. In subsequent years the CBO used the Census' estimated market value of Medicare and Medicaid.

(food stamps), subsidized housing, and school lunches on an annual basis. We include the Census imputed values of the market value of these in-kind government transfers. Each of these in-kind transfers are included as resources in the Census Bureau's Supplemental Poverty Measure (Interagency Technical Working Group 2010).

We also impute the value of tax credits and tax liabilities using NBER TaxSim 9.0 (see Feenberg and Coutts 1993 for more information on the TaxSim program). Tax liabilities include federal and state income tax liabilities as well as FICA and SECA taxes based on the tax laws in effect in each year and also include refundable and non-refundable tax credits including the Earned Income Tax Credit (EITC) and Child Tax Credit (CTC). To better reflect the tax filing units from which actual tax credits and liabilities are determined, we construct tax units within each household prior to imputing tax credits and liabilities using the Burkhauser, Larrimore and Simon (2012) procedure, which is based on the same assumptions Piketty and Saez (2003) use to create their tax units.

The fourth measure, disposable income plus health insurance (definition 4), includes disposable income plus the market value of employer-sponsored health insurance and government-provided (Medicare and Medicaid) health insurance. It is the most complete of the four yearly measures of the flow of resources available to individuals and their households.

In constructing this fourth measure, we note that in-kind benefits in the form of health insurance, like all other in-kind benefits, have value to individuals—otherwise employees would negotiate higher wages in exchange for foregoing health insurance and government actors would have a strong incentive to replace Medicaid and Medicare benefits with cash transfer programs or lower taxes. Measures that exclude the value of health insurance as a resource undervalue its worth by effectively placing a zero value on access to this resource. This exclusion will not only

understate the level of household resources but also their trend, as the value of health insurance benefits has increased in both absolute terms and as a share of wage compensation or as a share of all government transfers to households.

Following the approach of Burkhauser et al. (2012) and the CBO (2012, 2013), we include the market value of health insurance in our measures of income (disposable income plus health insurance, definition 4). This value is based on the Census Bureau's imputed value of health insurance, although we use the full market value rather than just its fungible value. The Census Bureau imputes the value of employer-sponsored health insurance by first determining whether the individual is covered by an employer-sponsored plan and whether the employer paid for all, part, or none of the plan premium. Next, persons in the March CPS are statistically matched to persons in the National Medical Care Expenditure Survey or Medical Expenditure Panel Survey (depending on survey year) based on several demographic characteristics to impute the cash value of employer contributions. The Census Bureau uses this imputed value as its measure of the market value of private insurance for covered workers. Individual expenditures on employer-sponsored health insurance plan premiums or expenditures on small-group/individual market health plans come from other income sources and are not included as income.

For government-subsidized health insurance (Medicare and Medicaid), the Census Bureau determines the average government cost of providing Medicare and Medicaid to those reporting that they have this insurance by state and risk class. The two risk classes for Medicare are aged and disabled. The four risk classes for Medicaid are aged, disabled, children, and

adults.[5] Thus, the imputed average cost of government-provided health insurance varies by state and the government insurance pool from which beneficiaries access it.

In determining the value of Medicaid and Medicare, for individuals who qualify for both programs (dual eligible), we follow the Census Bureau's approach and estimate the value of their health insurance as the combined cost of insurance from each program. CBO (2012) and Armour, Burkhauser, and Larrimore (2014) do the same. This assumes that the total value of the insurance dual-eligible individuals receive is not only greater to them than the value for those insured under only one of these programs but is greater by the average cost of the other program. This may overstate this value to the degree that there is overlap in coverage. But it might understate it to the degree that dual-eligible individuals have higher than average medical expenses relative to those who are only covered by one program. So this value still may be less than the cost dual-eligible individuals incur if they purchase equivalent insurance on the private market.[6]

Unit of Analysis

Our unit of analysis is the individual. To account for economies of scale in household consumption, household income is divided by the square root of the number of persons in the

[5] The Medicare and Medicaid risk classes reflect the channel through which benefits were accessed. The Medicare risk class "aged" applies to all persons on Medicare aged 65 or older. The Medicare risk class "disabled" applies to all persons accessing Medicare benefits through the SSDI program. The Medicaid risk class "children" applies to children accessing Medicaid benefits through either traditional Medicaid or a state's Children's Health Insurance Program (CHIP). The Medicaid risk class "adults" applies to all adults under the age of 65 accessing Medicaid benefits. The Medicaid risk class "aged" applies to all persons accessing Medicaid aged 65 or older. Lastly, the Medicaid risk class "disabled" applies to all persons accessing Medicaid benefits due to their qualification for SSI benefits.

[6] With the implementation of the Affordable Care Act of 2010, this may no longer be the case, since insurance companies, beginning January 1, 2014, are no longer permitted to adjust their premiums based on pre-existing conditions. However, for the years included in this study insurers could deny insurance to those with pre-existing conditions and/or charge such individuals higher premiums. In the discussion section we further explore the impact of the Affordable Care Act on how health insurance should be valued in comprehensive income measures.

household.[7] This size adjustment is common in US and international research studies of income trends and inequality (for example, see Gottschalk and Smeeding 1997; Atkinson and Brandolini 2001; d'Ercole and Förster 2012; Ruggles 1990).

Inflation

All incomes are adjusted to 2010 dollar amounts using the Consumer Price Index Research Series (CPI-U-RS) (Stewart and Reed 1999). This follows previous research considering both population-level income trends (DeNavas-Walt and Proctor 2014) and those measuring the relative resources of those with and without disabilities (Burkhauser and Larrimore 2009).[8]

Other Variables Used in the Analysis

Since we are focusing on the individual we will compare those working-age individuals (aged 18-64) with and without disabilities by gender, race, marital status, and their employment status. (See Appendix Table 1A for demographic characteristics of our working-age population.)

## II. RESULTS

Figure 3 (Panel A) reports the levels and trends in the median income of working-age people with disabilities (measured in 2010 dollars) using our four alternative measures of income. Figure 3 (Panel B) does so for working-age people without disabilities. The trend in market income of the median working-age person with disabilities follows, albeit with relatively little variation, the economic business cycle pattern over the first two full business cycles

[7] While size-adjusted income is an individual-level value, it can easily be converted to consider the income of a family of four by doubling the size-adjusted income values presented in the paper.

[8] While we follow the standard practice of using a uniform inflation measure, the inflation rates for all goods and services is not uniform. To the extent that some individuals consume a larger fraction of goods which have increased in price faster or slower than the general rate of inflation, the uniform measure may overstate or understate their actual improvement in well-being. This may particularly be the case for individuals who consume a larger share of health services which have increased in price at a relatively faster rate. See Burkhauser et al. (2013) for a discussion of this issue and other issues related to estimating the value of health insurance.

captured trough-to-trough in the data (1983-1993-2004) but less so in the third (2004-2011).[9] It rises slightly from trough year 1983 through peak year 1989 before falling even lower by trough year 1993. It then rises to a 1999 high before falling to approximately its trough year 1993 level in trough year 2004. With the exception of a slight increase in 2006, it has fallen continuously since then, reaching a record low for the past 30 years in trough year 2011. Even in 2012 when market income recovered slightly for working-age people without disabilities—Figure 3 (Panel B)—the market income of those with disabilities continued to fall. Over the three full trough-to-trough business cycles that Panel A captures, median market income for working-age people with disabilities fell from $13,304 in 1983 to $9,448 in 2011, with most of the decline occurring in the first and third business cycle.

This substantial drop in market income among working-age people with disabilities has been offset by increases in other sources of income. Median market and cash transfer income combined is not only higher in all years, but the growth of government cash transfers has increasingly mitigated the drop in market income over time. Median disposable income is slightly lower than market and cash transfer income in all years but this difference is smaller in later years. Over the three full trough-to-trough business cycles that Panel A captures, median disposable income rose from $17,529 in 1983 to $18,347 in 1993 to $19,989 in 2004 before falling to $18,840 in 2011, for an overall increase of 7.5%.

Including the market value of employer- and government-provided health insurance dramatically changes the trajectory of median income for this population. In 1983 there is very

[9] Trough years are defined as the last year in which median size-adjusted market income of all persons falls following a recession—1983, 1993, 2004, and 2011—and peak years are defined as the highest median market income year between these troughs—1989, 2000, and 2007. With the exception of 1983, the median market income trough years follow the official NBER recession ending years—the shaded years in this figure. This is the case, because the major component of market income is labor earnings and it is a lag indicator of business recovery.

little difference between our median disposable income and median disposable income plus health insurance measures. But the substantial increases since then in access to health insurance (Figure 2, Panel A) and in its median value to those it covers (Figure 2, Panel B) profoundly increases the gap between these two measures of income. Median disposable income including health insurance rises substantially over the first two business cycles. It peaks in 2005 before declining through 2008. With the coming of the Great Recession, the value of health insurance beings to grow again and more than offsets the decline in other income, so that while median disposable income has fallen continuously since 2008, when the value of health insurance is added, median income increases slightly in 2009 and 2010 before falling slightly in subsequent years. That is, using our most complete measure of income we find that the economic resources available to the median person with disabilities have grown substantially over the past 30 years. Over the entire three-business-cycle period (1983-2011), median disposable income plus health insurance increased by 51% from $19,978 to $30,137.

As can be seen in Figure 3 (Panel B), the market income of working-age people without disabilities is more sensitive to business cycle peaks and troughs. Adding cash transfers increases the level of income but once taxes are subtracted median income falls. Nonetheless the disposable income of the median working-age person without disabilities grew substantially over the first two business cycles (from $25,875 in 1983 to $29,205 in 1993 to $33,673 in 2004) before falling over the last business cycle (to $32,100 in 2011) for an overall increase of 24%.

Adding the market value of health insurance to the disposable income of people without disabilities also increases the observed level of resources for this population and increases its overall growth from 1983 to 2011 to 33%. This reflects the growing cost of health care in the United States and hence the savings to individual households whose health insurance is provided

to them by their employer or the government, rather than having to purchase it independently.[10] But the impact of including the market value of health insurance on the income trend of working-age people without disabilities is substantially smaller when compared to doing so for working-age people with disabilities in Panel A of Figure 3.

The Income Gap between Working-Age People with and without Disabilities

Figure 4 focuses on levels and trends in the gap between the median incomes of working-age people with and without disabilities over the period 1980-2012. We derive these gaps by subtracting the median income values by year for each income definition in Figure 3 (Panel A) from their counterparts in Figure 3 (Panel B). The gap in market income is the largest. It grew substantially over the first two business cycles, but especially during the period of economic growth between 1983-1989 and 1995-2000. The gap remained the same over the most recent 2004-2011 business cycle. Over all three business cycles, however, the gap has grown from $17,813 in 1983 to $26,764 in 2011. The gap is somewhat smaller for market and cash transfer income, but the trends are the same. Over all three business cycles, the gap has grown from $12,908 in 1983 to $18,633 in 2011. The gap is even smaller for disposable income, but the trends are once again the same. Over the three business cycles, the gap in disposable income has grown from $8,346 in 1983 to $13,260 in 2011.

While the trends are the same for the first three series, they diverge when including the market value of health insurance to the income measure. Additionally, the gap in median income between those with and without disabilities falls even further. While the gap increases during growth periods, similar to the other three median income measures, the decline after the peak

[10] A separate question is whether increases in the observed increase in the price of health insurance simply reflects medical inflation, with individuals receiving the same level of health care at higher costs, or improvements in the quality of health benefits.

year is smaller so that the overall gap remained the same for the business cycle of 1983-1993, and fell between 1993 and 2004. The gap falls slightly between 2004 and 2011 for the same reasons. Over the three business cycles, the gap has declined from $7,636 in 1983 to $6,164 in 2011. Hence, including the value of health insurance in a fuller measure of disposable income reduces the gap in median income between working-age people with and without disabilities from 1983-2011. This is consistent with the growth in access to health insurance in the working-age population with disabilities over this period reported in Figure 1 and the increase in the values of government-provided health insurance over this period reported in Figure 2.

Change in the Characteristics of those in the Lowest Income Quintile of the Population

Figure 5, using this same fuller measure of disposable income, shows that the share of the working-age population with disabilities in the lowest quintile also falls over time. In 1983 working-age people with disabilities made up 12.66 percent of the working-age population in the bottom income quintile of the population. Despite the fact that the prevalence of disability in the working-age population rose slightly from 7.24 percent to 8.17 percent, the share of people in the bottom income quintile who report a disability fell to 10.49 percent in 2011. Over the same period, the percentage of people with disabilities in the middle three quintiles rose with little change in the top quintile.

Changing Portfolio of Income Sources for Persons with and without Disabilities

Table 1 provides additional insight into the growing importance of the market value of public health insurance in the income portfolios of working-age people with disabilities (measured in 2010 dollars). It estimates mean gross income from private and all government sources including the market value of health insurance (our fourth measure of income gross of taxes) for both working-age people with and without disabilities. It then divides this value into its

nine non-overlapping income sources, including some that include the market value of health insurance, and shows how these shares change across the four trough years discussed above.

Table 1 is configured to take advantage of the fact that mean income in any year can be divided into the sum of the mean of its sources when there are no negative sources of income. The first three income sources (own labor earnings, the labor earnings of others in the household, and private non-labor income) represent total in-cash market income (income definition 1). The next two (DI and/or SSI cash transfers and all other public cash transfers) represent gross in-cash government transfers. These first five sources of income make up income definition 2. The next is government in-kind transfers excluding health insurance. The first six sources of income represent the total gross income before taxes used in disposable income (income definition 3). For the moment we do not consider the effect of taxes on this gross income measure as is done in income definition 3. The last three (the market value of employer-provided health insurance, the market value of government-provided health insurance to those receiving DI and/or SSI, and the market value of all other government-provided health insurance) represent the market value of employer- and government-provided health insurance used in income definition 4.[11]

These shares sum to 100% in Table 1. The final column reports the share of gross income that was paid in taxes. We separate this negative value from our portfolio shares of gross incomes in the other columns that sum to 100% to more easily isolate its impact.

For those without disabilities, market income provides the overwhelming share of pre-tax gross income: 91.44% in 1983. While this falls slightly across the other three trough years, market income remains the dominant source of income for working-age people without disabilities and is over 88% in each of the four years considered. In contrast, the share of pre-tax

[11] The market value of Medicare and Medicaid accessed through channels outside of DI or SSI is included in the value of all other government health insurance.

gross income coming from market sources falls markedly for those with disabilities. In 1983, market income made up 70.80% of gross income in 1983. By 2011 it is only slightly more than half of the gross income of those with disabilities, 51.30%.

Somewhat surprisingly, while DI and/or SSI cash transfers increases to some degree from 1983 to 2004, this increase is entirely offset by declines in other government cash transfers so that total government in-cash transfers falls slightly. However, DI and/or SSI cash transfers then rise to 18.00% in 2011. Aided by a slight increase in other government cash transfers, total government cash transfers rise to 21.70% in 2011. But it is private and government health insurance whose share of gross income increases the most for this population, from 8.82% in 1983 to 25.53% in 2011. The rise in the share of gross income coming from government-provided Medicare and Medicaid to DI and/or SSI recipients is driving this increase, representing less than 5% of the gross income of working-age people with disabilities in 1983 and over 18% in 2011.

To give some perspective on this finding, in 1983 government-provided Medicare and Medicaid to DI and/or SSI recipients was the sixth most important source of income for working-age people with disabilities behind the market income from others' earnings, own labor earnings, private non-labor earnings, DI and/or SSI cash transfers, and all other public cash transfers respectively. In 2004 and 2011 it was the second most important resource, behind only the labor earnings of others in the household.

## III. DISCUSSION

We have shown that a substantial and increasing share of the resources working-age people with disabilities receive comes in the form of government-provided health insurance, whose market value has increased dramatically over the last 30 years. When we systematically include these resources at their market value in our income measures, the income gap between

those with and without disabilities narrows rather than increases over time and the share of those with disabilities in the bottom quintile of the working-age population falls.

But what are some of the implications for future policy analysis of including the market value of health insurance as income? Working-age people with disabilities are likely to continue to require substantially greater medical services per capita than are working-age people without disabilities. Hence, the government cost of providing free or subsidized health insurance to them will continue to be greater than it is for working-age people without disabilities.[12] In this case, using a resource measure that includes the market value of health insurance better aligns the measured resources of individuals with the budgetary costs of providing those resources.

But does the cost of providing this resource appropriately reflect the price that individuals with disabilities pay for equivalent insurance in the private market? Before the implementation of the ACA, which is the focus of this paper, the link between the government cost of providing health insurance and the market price recipients would pay for equivalent insurance in the private market is straightforward. Because private insurers in most states could adjust premiums (or deny insurance) to those with pre-existing conditions, it was generally difficult and expensive for people with disabilities to obtain insurance on their own through the non-group market. As a result, for a growing share of the working-age population with disabilities government-provided health insurance was their best option. This is why we followed the CBO practice in setting the pre-ACA market value of this government-provided insurance at the average cost the

[12] Presumably, the higher health insurance premiums working-age people with disabilities face in the underwritten non-group market reflect their higher expected use of medical services. Hence working-age people with disabilities who receive subsidized health insurance are better off because of the subsidy than they would otherwise be if they had to pay the full premium. This does not suggest that their economic well-being is greater than if they did not have a disability in the first place.

government paid to provide these programs, reflecting our assumption that this was what beneficiaries would have had to pay for this insurance in the private market.

Explicitly estimating the market value of Medicare and Medicaid also shows why some working-age people with disabilities, whose pre-existing conditions predicted they would require more expensive future medical services, but who could work to some degree, chose to move onto the DI/SSI rolls. In the case of those who were eligible for both Medicaid and Medicare this value has been over $20,000 per year since 2002. This provides a substantial incentive to apply for DI/SSI benefits and a disincentive to work part-time or enter the labor force once on the disability rolls, if by doing so those benefits are lost. This incentive would be completely missed were one to focus exclusively on either market income or disposable income excluding the value of health insurance.

But, since January 1, 2014, under the Affordable Care Act of 2010, insurance companies that offer plans through the exchange are no longer permitted to adjust their premiums or deny coverage based on pre-existing conditions, policies commonly referred to as community rating and guaranteed issue. This change in the law has made it less difficult and less expensive for people with disabilities to obtain insurance in the private market by lowering the market price for them since they are now more easily able to enter an insurance pool of healthier members. It also means that the average government cost of providing Medicare and Medicaid to those who remain on DI/SSI (a group with a higher risk of health insurance services and hence a higher average insurance cost for group coverage than the exchange price) no longer represents the price they would face for equivalent market insurance. Thus, for years since 2014 researchers can use the sum of the unsubsidized exchange premium and the expected unsubsidized value of beneficiary cost-sharing in the exchange as the market price of Medicare/Medicaid for working-

age people with disabilities on these programs now that they have the option of obtaining health coverage through the ACA exchanges.[13]

Using the market price of health insurance coverage on the exchanges in this way has several important implications. First, it will provide a more accurate representation of the marginal costs associated with working-age people with disabilities forgoing access to disability-based government-provided insurance via employment in recent years. Continuing to value Medicare and Medicaid insurance at its full budgetary cost, as we do in this paper for years before 2014, rather than at the presumably lower community-rated cost for an equivalent covered health benefits policy on the exchange, will beginning in 2014 overstate its market price and underestimate the extent to which working-age people with disabilities are willing to enter employment despite potentially losing their publicly provided health insurance. Hence, using the budgetary cost of health insurance pre-2014 and the cost of community-rated health benefits on the exchange starting in 2014 will most accurately capture these changing incentives.

Second, because the community-rated ACA's exchange plans effectively reduce the cost of private market insurance for working-age people with disabilities who have greater than average risk of requiring health services, to the extent that they now take-up this new insurance option and leave the Medicare or Medicaid rolls, this will directly shift part of the burden of providing these more costly health services onto policies offered through the ACA exchanges.

Third, changing how we estimate the market price of health insurance to reflect the post-ACA realities of the health insurance market will also likely shift the measured mix of in-kind

[13] Cost-sharing can be estimated using the posted actuarial value of exchange plans. For example, a Silver Plan with a 70% actuarial value covers 70% of the health spending of the average cost person in the risk pool. Thus, the average beneficiary would pay 30% of their health costs. This measure does not account for any additional differences between private and public insurance with respect to provider network breadth and payment rates which may affect access to physicians and hospitals.

and in-cash transfers for people with disabilities. Currently, a substantial and growing fraction of the household resources of working-age people with disabilities is in the form of Medicare and Medicaid. But the availability of alternate health insurance options for those who qualify to buy insurance through a health insurance exchange would reduce the desirability of Medicare and Medicaid relative to in-cash or other in-kind government transfers because the market price of this equivalent health insurance is lower. However, it is important to recognize that this may not indicate that the government's cost of providing Medicare and Medicaid to these individuals has declined—but rather that the budgetary cost and the price that the recipient would pay for equivalent insurance in the market may be less aligned as additional outside health insurance options become available.

Finally, the government will continue to provide a substantial share of the resources of working-age people with disabilities in the form of health insurance, either in the form of explicit in-cash subsidies via the exchanges or through in-kind Medicare or Medicaid insurance. Both the costs to the government of providing them and the market price of equivalent insurance are relevant to the discussion of disability policy reforms. Considering resources in this broader way can help policymakers evaluate the mix of in-kind and in-cash transfers government provides, the behavioral consequences of various programs targeting those with disabilities, and the path forward for disability programs.

REFERENCES


Armour, P., R.V. Burkhauser, and J. Larrimore. "Levels and Trends in United States Income and Its Distribution: A Crosswalk from Market Income towards a Comprehensive Haig-Simons Income Measure." *Southern Economic Journal*, 81(2), 2014, 271–93.

Atkinson, A.B., and A. Brandolini. "Promises and Pitfalls in the Use of Secondary Data Sets: Income Inequality in OECD Countries as a Case Study." *Journal of Economic Literature* 39(3), 2001, 771–99.

Atkinson, A.B., T. Piketty, and E. Saez. "Top Incomes in the Long Run of History." *Journal of Economic Literature* 49(1), 2011, 3–71.

Benítez-Silva, H., M. Buchinsky, H.M. Chan, S. Sheidvasser, and J. Rust. 2004. "How Large Is the Bias in Self-Reported Disability?" *Journal of Applied Econometrics*, 19(6), 2004, 649-70.

Blank, R.M. *Changing Inequality*. Berkeley, CA: University of California Press, 2011.

Bound, J., and R.V. Burkhauser. "Economic Analysis of Transfer Programs Targeted on People with Disabilities," in *Handbook of Labor Economics*, Vol. 3C, edited by O. Ashenfelter and D. Card. Amsterdam: Elsevier Science North-Holland, 1999, 3417–528.

Burkhauser, R.V., M.C. Daly, A.J. Houtenville, and N. Nargis. 2002. "Self-Reported Work-Limitation Data: What They Can and Cannot Tell Us." *Demography*, 39(3), 2002, 541–55.

Burkhauser, R.V., and M.C. Daly. *The Declining Work and Welfare of People with Disabilities: What Went Wrong and a Strategy for Change*. Washington, DC: The AEI Press, 2011.

Burkhauser, R.V., A.J. Houtenville, and J. Tennant. "Capturing the Elusive Working-Age Population with Disabilities: Reconciling Conflicting Social Success Estimates from the Current Population Survey and American Community Survey." *Journal of Disability Policy Studies,* 24(4), 2014, 195–205.

Burkhauser, R.V. and J. Larrimore. "Using Internal CPS Data to Reevaluate Trends in Labor-Earnings Gaps." *Monthly Labor Review*, August 2009, 3–18.

Burkhauser, R.V., J. Larrimore and K. Simon. "A Second Opinion on the Economic Health of the American Middle Class and Why it Matters in Gauging the Impact of Government Policy." *National Tax Journal*, 65 (March), 2012, 7–32.

Burkhauser, R.V., J. Larrimore, and K. Simon. "Measuring the Impact of Valuing Health Insurance on Levels and Trends in Inequality and how the Affordable Care Act of 2010 Could Affect Them." *Contemporary Economic Policy*, 31(4), 2013, 779–94.

Burtless, G., and S. Milusheva. "Effects of Employer-Sponsored Health Insurance Costs on Social Security Taxable Wages," *Social Security Bulletin* 73(1), 2013, 83–108.

Burtless, G., and P. Svaton. "Health Care, Health Insurance, and the Distribution of American Incomes," *Forum for Health Economics & Policy* 13(1), 2010.

Congressional Budget Office (CBO). "The Distribution of Household Income between 1979 and 2007." Washington DC: U.S. Government Printing Office, 2011.

Congressional Budget Office (CBO). "The Distribution of Income and Federal Taxes, 2008 and 2009." Washington, DC: U.S. Government Printing Office, 2012.

Congressional Budget Office (CBO). "The Distribution of Income and Federal Taxes, 2010." Washington, DC: U.S. Government Printing Office, 2013.

Daly, M.C., and R.G. Valletta. "Inequality and Poverty in the United States: The Effects of Rising Dispersion of Men's Earnings and Changing Family Behavior." *Economica* 73(289), 2006, 75–98.

DeNavas-Walt, C., and B.D. Proctor. *U.S. Census Bureau, Current Population Reports P60-249, Income and Poverty in the United States: 2013*. Washington, DC: U.S. Government Printing Office, 2014.

d'Ercole, M.M., and M. Förster. "The OECD Approach to Measuring Income Distribution and Poverty: Strengths, Limits and Statistical Issues," In *European Measures of Income and Poverty: Lessons for the U.S.*, edited by D.J. Besharov and K.A. Couch. New York, NY: Oxford University Press, 2012.

Feenberg, D., and E. Coutts. "An Introduction to the TAXSIM Model." *Journal of Policy Analysis and Management*, 12(1), 1993, 189–94.

Gottschalk, P., and S. Danziger. "Inequality of Wage Rates, Earnings and Family Income in the United States, 1975–2002." *Review of Income and Wealth*, 51(2), 2005, 231–54.

Gottschalk, P., and T.M. Smeeding. 1997. "Cross-National Comparisons of Earnings and Income Inequality." *Journal of Economic Literature*, 35(2), 1997, 633–87.

Houtenville, A.J., D.C. Stapleton, R.R. Weathers II, and R.V. Burkhauser (eds.) *Counting Working-age People with Disabilities: What Current Data Tell Us and Options for Improvement*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2009.

Interagency Technical Working Group. "Observations from the Interagency Technical Working Group on Developing a Supplemental Poverty Measure," 2010. Available at: http://www.census.gov/hhes/www/poverty/SPM_TWGObservations.pdf

Larrimore, J., R.V. Burkhauser, S. Feng, and L. Zayatz. "Consistent Cell Means for Topcoded Incomes in the Public Use March CPS (1976–2007)." *Journal of Economic and Social Measurement*, 33(2-3), 2008, 89–128.

Livermore, G., D.C. Stapleton, and M. O'Toole. 2011. "Health Care Costs are a Key Driver of Growth in Federal and State Assistance to Working-Age People with Disabilities." *Health Affairs* 30, (9), 2011, 1664–72.

Piketty, T., and E. Saez. "Income Inequality in the United States, 1913–1998." *Quarterly Journal of Economics* 118(1), 2003, 1–39.

Ruggles, P. *Drawing the Line: Alternative Poverty Measures and their Implication for Public Policy*. Washington, DC: Urban Institute Press, 1990.

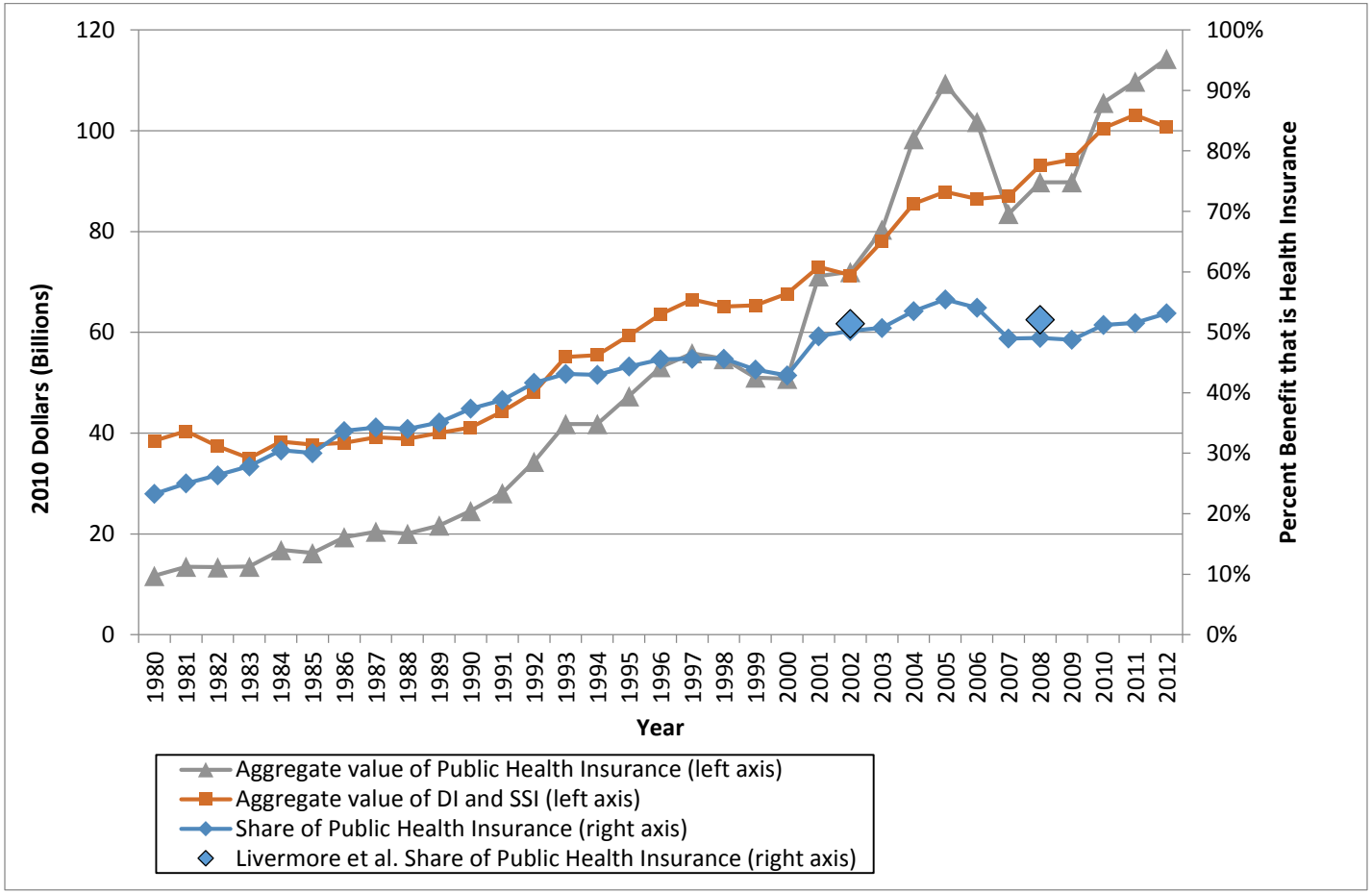
Sommers, B.D., and D. Oellerich. "The Poverty Reducing Effect of Medicaid." *Journal of Health Economics*, 32(5), 2013, 816–32.

Stapleton, D.C. "Bending the Employment, Income, and Cost Curves for People with Disabilities." Center for Studying Disability Policy, Washington DC, 2011.

Stern, S. "Measuring the Effect of Disability on Labor Force Participation." *Journal of Human Resources*, 24(3), 1989, 361–95.

Stewart, K.J., and S.B. Reed. "CPI Research Series Using Current Methods, 1978-98." *Monthly Labor Review,* 122(6), 1999, 29–38.

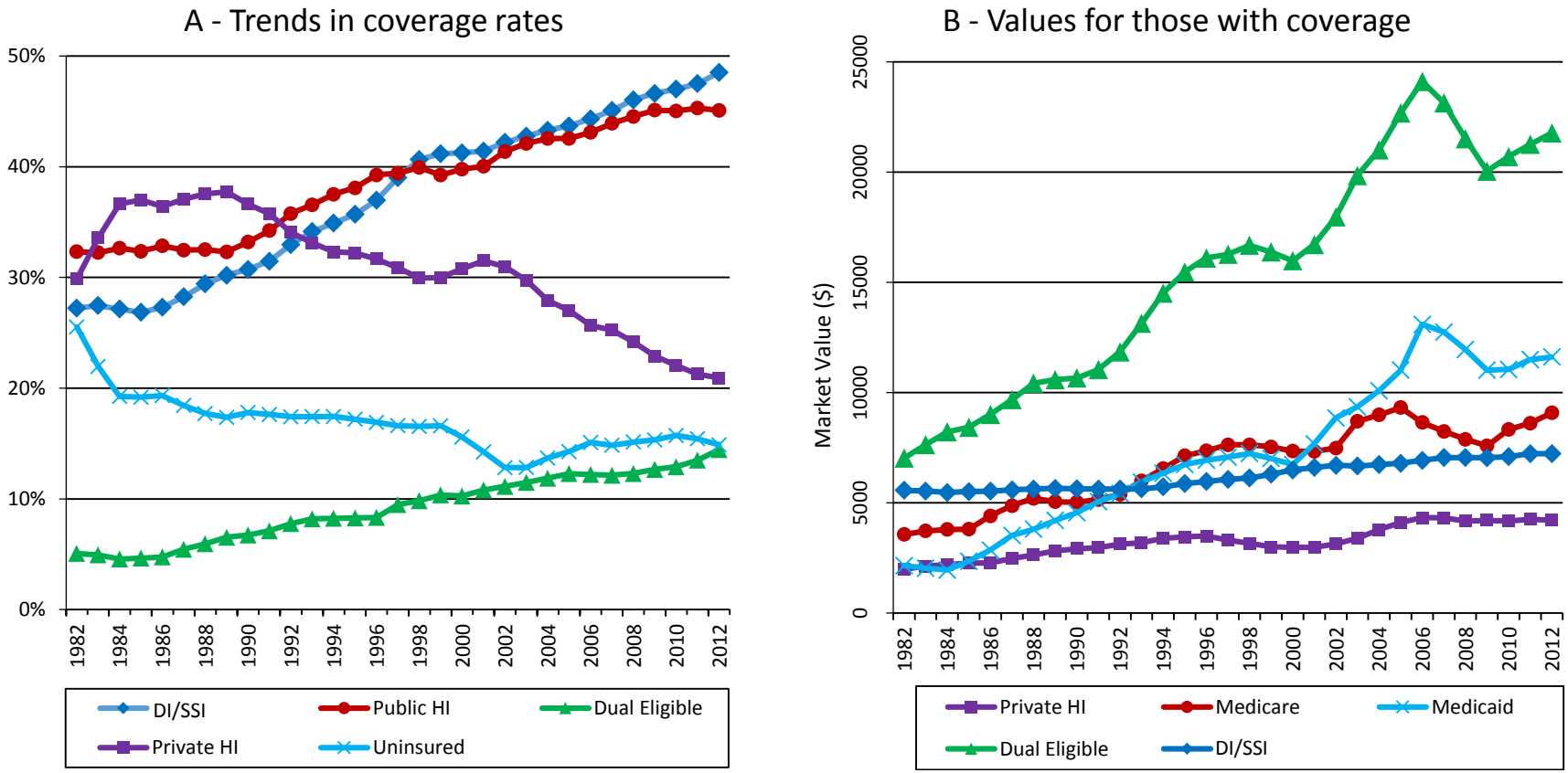
**Figure 1. Yearly value of publically provided health insurance and disability-based cash transfers and the share of health insurance in that total for working-age people with disabilities (1980-2012)**




*Source:* Author's estimation from March CPS data and Livermore et al. (2011)

*Notes*: Publically provided health insurance (Public HI) includes the market value of Medicare and Medicaid; disability-based cash transfers include DI and SSI benefits (DI and SSI) based on CPS reported data for working-age people with disabilities; Livermore et al. (2011, unpublished Data Appendix Exhibits 1A and 2A) values estimate these benefits based on aggregate program data.

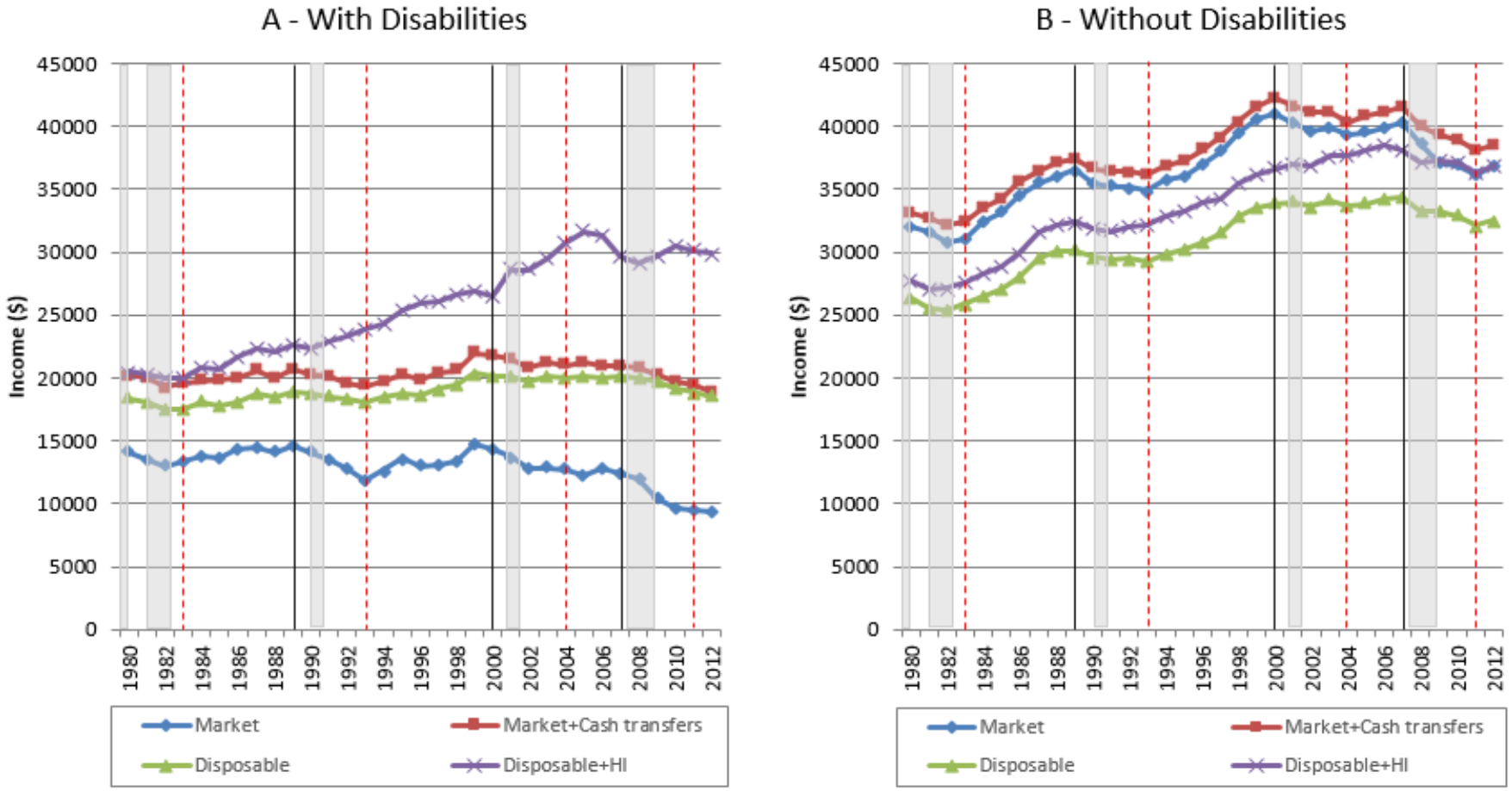
**Figure 2. Trends in public and private health insurance coverage and disability-based cash transfers and their value for working-age people with disabilities (1980-2012)**




*Source:* Author's estimation from March CPS data.

*Notes:* Yearly values are three-year moving averages with 1982 being the mean value of 1980-1982. Prevalence rates of working-age (18-64) people with disabilities covered by Medicare or Medicaid (Public HI), Medicare and Medicaid (Dual Eligible), and employer-provided health insurance (Private HI), those not covered by these sources of health insurance (Uninsured), and those receiving Social Security Disability Insurance or Supplemental Security Income (DI/SSI) benefits.

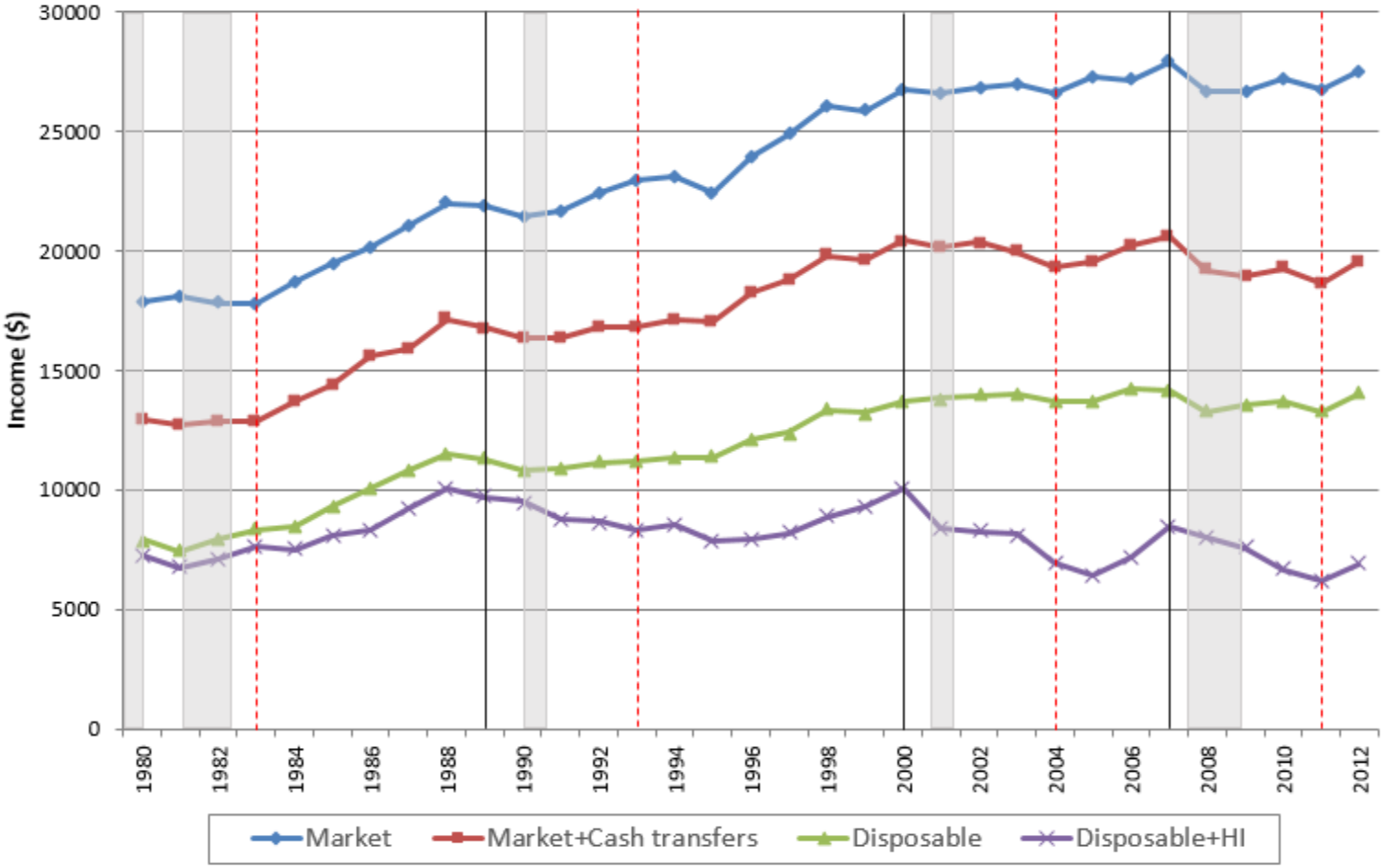
**Figure 3. Trends in median size-adjusted income by income definition for working-age people with and without disabilities (1980-2012)**




*Source:* Author's estimation from March CPS data.

*Notes:* Median household size-adjusted income in 2010 dollars of working-age (18-64) people with and without disabilities by income definition (1980-2012).

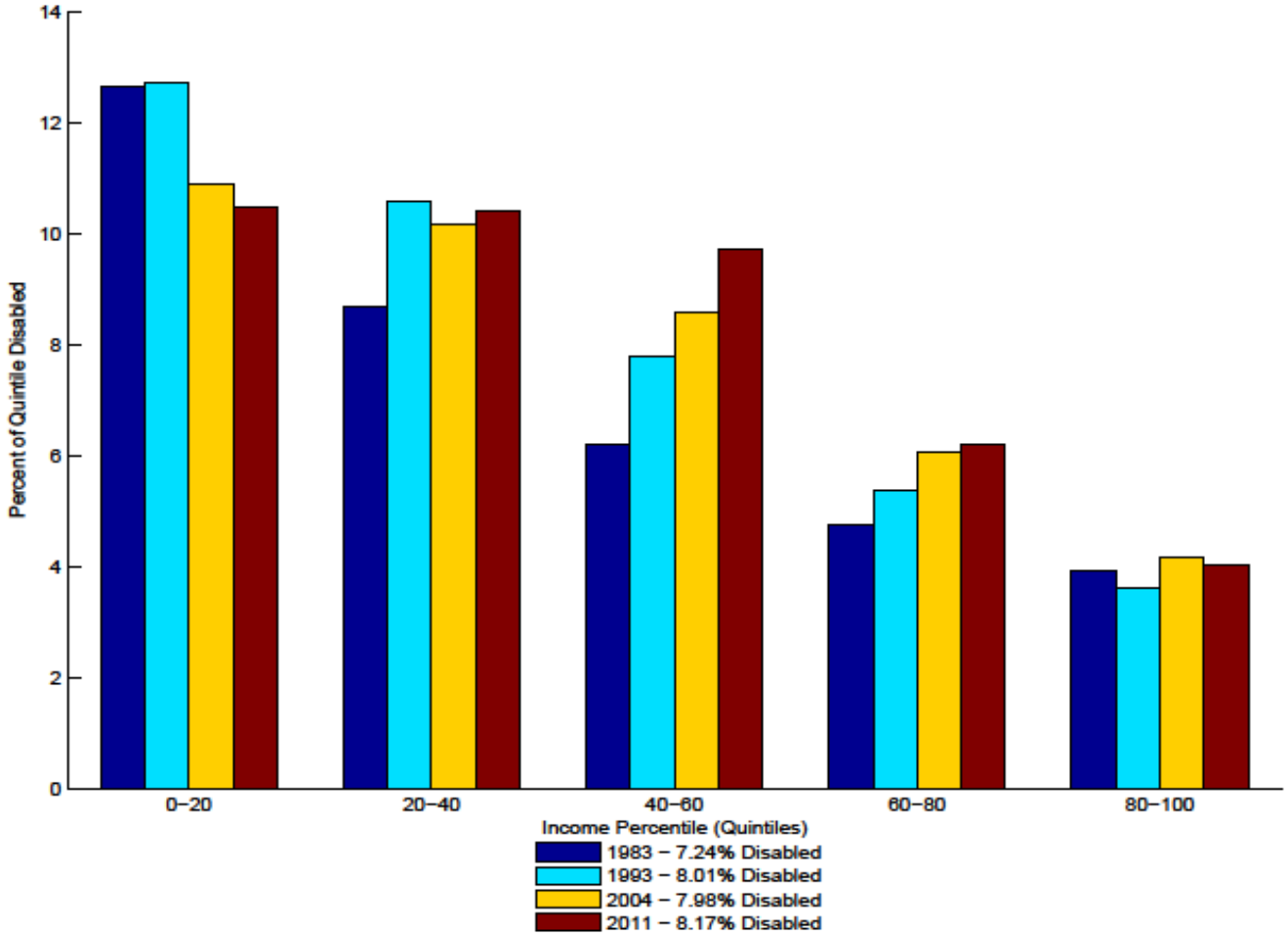
**Figure 4. Trends in the Disability Median Income Gap by Income Definition**




*Source: Author's estimation from March CPS data.*

Notes: Gap between the median size-adjusted income of working-age (18-64) people without and with disabilities based on values for relevant income measures in 2010 dollars in Table 5A and 5B for (1980- 2012).

**Figure 5. Share of All Working Aged Persons in Trough Year Size-adjusted Income Quintiles based on Disposable Income plus the Value of Health Insurance who have Disabilities**




*Source:* Author's estimation from March CPS data.

*Notes:* The legend above shows by trough year the percent of all working age persons who report a work limitation in that year.

## Table 1. Trends in the share of gross mean income including the value of health insurance by income source for working-age people with and without disabilities

| Year | Mean Gross (pre-tax) Size-adjusted Income($) | Own Labor Income | Others' Labor Income | Private Non-Labor Income | DI/SSI Cash Transfers | Other Public Cash Transfers | Public in-kind transfers excluding HI | Private Health Insurance | Public Health Insurance to DI/SSI recipients | Other Public Health Insurance | Total Share | Taxes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | With Disabilities | | | | | | |
| 1983 | 27,487 | 17.45 | 37.52 | 15.83 | 13.21 | 6.07 | 1.1 | 2.64 | 4.89 | 1.29 | 100.00 | 15.46 |
| 1993 | 31,104 | 15.43 | 34.54 | 12.46 | 14.67 | 5.21 | 1.29 | 3.16 | 10.72 | 2.51 | 100.00 | 11.92 |
| 2004 | 38,588 | 11.75 | 32.66 | 11.61 | 15.43 | 3.62 | 0.81 | 3.21 | 17.18 | 3.72 | 100.00 | 10.13 |
| 2011 | 37,101 | 8.23 | 32.20 | 10.87 | 18.00 | 3.70 | 1.47 | 2.78 | 18.43 | 4.32 | 100.00 | 8.99 |
| | | | | | | Without Disabilities | | | | | | |
| 1983 | 39,213 | 40.12 | 43.80 | 7.52 | 1.98 | 1.73 | 0.34 | 3.65 | 0.49 | 0.38 | 100.00 | 23.65 |
| 1993 | 47,613 | 40.76 | 42.16 | 7.54 | 1.80 | 1.30 | 0.32 | 4.68 | 0.83 | 0.60 | 100.00 | 22.25 |
| 2004 | 55,181 | 41.62 | 41.35 | 6.85 | 1.75 | 0.69 | 0.20 | 5.41 | 1.28 | 0.85 | 100.00 | 20.34 |
| 2011 | 53,478 | 40.49 | 41.46 | 6.29 | 2.19 | 1.19 | 0.39 | 5.05 | 1.58 | 1.37 | 100.00 | 19.36 |

*Source:* Author's estimation from March CPS data.

*Notes:* Column 1 reports yearly mean before tax gross income including the market value of private and publically provided health insurance. This is income definition 4 but net of taxes in 2010 dollars for working-age (18-64) persons with and without disabilities for trough years. The next nine columns report the percentage of gross income accounted for by that source of income each year. These values sum to 100 in each year. The last column reports the decline in the share of gross income in each year caused by taxes.

## Appendix

### *Methods for the Text Figures*

Figure 1 Methods

In Figure 1 we report total federal government expenditures from 1980 to 2012 on DI and/or SSI (DI/SSI) cash transfers as well as public health insurance (Medicare and/or Medicaid) for the working-age population (18-64) who report a work-limiting disability in the March Current Population Survey (CPS). Our values for spending on DI/SSI come from CPS income source questions. SSI income is reported as a separate income source while Social Security income includes all Social Security Administration cash program payments (e.g., Old-Age and Survivor Insurance, Disability Insurance, and Disabled Adult Child benefits). We assume that all these cash payments to people aged 18-64 who report a work activity limitation are DI cash transfers.[14] Our market values for public health insurance are imputed by the Census and reflect the average cost of the Medicaid and/or Medicare program by state of residence and eligibility mechanism (e.g., New York State Medicaid-eligible through SSI enrollment). We include the market value of public health insurance only when the individual reports receiving DI/SSI cash transfers.

Because we are only interested in approximating and then comparing over time the federal government costs of providing DI/SSI cash transfers and public health insurance to working-age people with disabilities, in each year we simply sum up DI/SSI cash transfers and the value of public health insurance for each working-age person with disabilities. We use the CPI-U-RS series to adjust all values to 2010 dollars.

Finally in Figure 1 we create a share of public health insurance measure by dividing public health insurance by total federal government expenditures (DI/SSI plus public health insurance) to show the increasing importance of public health insurance as a part of the total of these two major sources of government resources for working-age people with disabilities over this period.

Livermore et al. (2011) compile their measure of DI and SSI cash benefits and Medicare and Medicaid expenditures for working-age people with disabilities based on aggregate government expenditure data for 2002 and 2008. Our methods can only approximate their methods and vary somewhat in levels for DI/SSI and public health insurance. But as can be seen in Figure 1 our share of public health insurance values are quite similar in level and trend to their values in 2002 and 2008. More importantly, we are able to extend our analysis over a much longer period and hence put these two years in a broader perspective.

[14] This assumption includes OASI spending from the SSA on people aged 62 to 64 who report a work activity limitation. Limiting the sample to persons aged 18 to 61 reduces cash and health insurance payments by 19% and 13% (on average), respectively. This limitation reduced payments more between 1980 and 1989 compared to after 1990. Thus, limiting the population to people aged 18 to 61 would yield higher growth rates in DI/SSI spending on both cash transfers and health insurance over the 1980 to 2012 window than what we currently present in our main analysis.

Figure 2 Methods

Figure 2 (Panel A) in the main text reports 3-year moving averages of health insurance coverage for working-age people with disabilities of: a) private health insurance (Private HI)—either via their own employer or as a spouse or dependent; b) total public health insurance (Public HI)—those whose eligibility derives from DI (Medicare), SSI (Medicaid), or those who are receiving both DI and SSI (Dual Eligible) and hence covered by both Medicare and Medicaid; c) Dual Eligible only; and d) Uninsured—those not covered by either Public or Private HI. In addition it reports the share of the working-age population with disabilities receiving either DI or SSI benefits.

The increase in take-up rates reported in Figure 2 (Panel A) explains 23% of the increase in disability-based transfer spending we report in Figure 1 in the text. The increase in the population reporting a work limiting disability explains 30% of the increase in disability-based transfer spending, while the remaining 46% of the increase can be explained by increases in the real generosity of DI/SSI. To estimate the share of the increase in aggregate DI/SSI spending associated with an increase in take-up rates we hold spending per beneficiary and the base population of those with disabilities constant at 1982 levels and then apply the 2012 take-up rate to the 1982 base population. To estimate the share of the increase in aggregate DI/SSI spending associated with an increase in the base population of those with disabilities we incrementally allow the base population to grow to 2012 levels and apply the 2012 take-up rate and 1982 per-beneficiary spending. Lastly, to estimate the share of the increase in aggregate DI/SSI spending associated with an increase in benefit generosity we incrementally allow the per-beneficiary payment to increase to 2012 levels.

DI/SSI enrollment in 1982 and 2012 was 2.8 million and 7.7 million, respectively. Aggregate spending on these programs calculated from the March CPS in 1982 and 2012 was $50.8 billion and $215.0 billion, respectively.

Figure 2 (Panel B) reports 3-year moving averages of the median market values of Private HI, Medicare, Medicaid, Dual Eligible, and DI/SSI cash benefits for working-age people with disabilities who are in the pool of those receiving such coverage or benefit. As was the case in Figure 1 we are reporting the value of health insurance and cash transfer to the person with disabilities only.

Appendix Figure 1A is a replication of Figure 2, but for the population of working-age people without disabilities. Figure 1A (Panel A) reports coverage rates for the same categories as Figure 2. The sources of health insurance for working-age people without disabilities are quite different from those for working-age people with disabilities. They mirror the familiar levels and trends reported for all working-age people, the vast majority of whom do not have a work limitation. Private HI is by far the most important source of health insurance coverage but the share of working-age people receiving it has fallen over time. Public HI has increased over time but not enough to offset Private HI declines so that the uninsured share has increased from the late 1980s through 2012.

Figure 1A (Panel B) reports the value of employer's contributions to Private HI since the other sources of health insurance coverage have limited take-up. While coverage of Private HI for the working-age population without disabilities has fallen over time, the median value employers contribute to that coverage has increased. As was the case in Figure 1, we are reporting the value of private health insurance to the person only.

Figure 3 Methods

Using March CPS data, Figure 3 in the main text presents median income trends for people with disabilities in Panel A for each of the four income definitions we use; Panel B presents these same trends for people without disabilities. Note that we are now focusing on the household sized-adjusted income of persons.
The sources of income obtained in the March CPS data that are subcomponents of the various income definitions above are:

1. Own labor income – Income from one's own labor earnings.
2. Labor income of others – Income from the labor earnings of others in the household.
3. Private non-labor income – Non-labor income of all persons in the household (e.g., rental income).
4. DI/SSI cash transfers – Cash DI/SSI transfers to all persons in the household.
5. Other public cash transfers – All other cash transfer programs (except DI/SSI) to all persons in the household (e.g., Temporary Assistance for Needy Families (TANF)).
6. Public in-kind transfers excluding the value of health insurance – Census Bureau's imputed market value of the Supplemental Nutrition Assistance Program (SNAP), school lunches, and housing subsidies to all persons in the household.
7. Market value of public health insurance for persons on the DI/SSI rolls – Census Bureau's imputed market value of Medicaid, Medicare, or both for persons on the DI/SSI rolls.
8. Market value of public health insurance for persons not on the DI/SSI rolls – Census Bureau's imputed market value of Medicaid, Medicare, or both for persons not on the DI/SSI rolls.
9. Employer contributions to employment-based health insurance plans – Census Bureau's imputed dollar contribution of employers to employment-based health insurance.
10. Taxes – National Bureau of Economic Research (NBER) TaxSim 9.0's estimated values of taxes paid by households divided by their pre-tax gross household income. See Feenberg and Coutts, 1993 for more information on the TaxSim program.

The market income series consists of items 1, 2, and 3 above. The market plus cash transfers series consists if items 1 through 5 above. The disposable income series consists of items 1 through 6 above as well as item 10. Finally, the disposable income plus cash transfers series consists of items 1 through 10 above. All incomes are subsequently adjusted to 2010 dollar amounts using the Consumer Price Index Research Series (CPI-U-RS).

Figure 4 Methods

Figure 4 reports the gap in median income between working-age people with and without disabilities, comparing the results in Panels A and B of Figure 3 in the text. The methods of constructing the income series in this figure are consistent with those in Figure 3 from which we derive the median income gaps. We subsequently adjust all incomes to 2010 dollar amounts using the Consumer Price Index Research Series (CPI-U-RS).

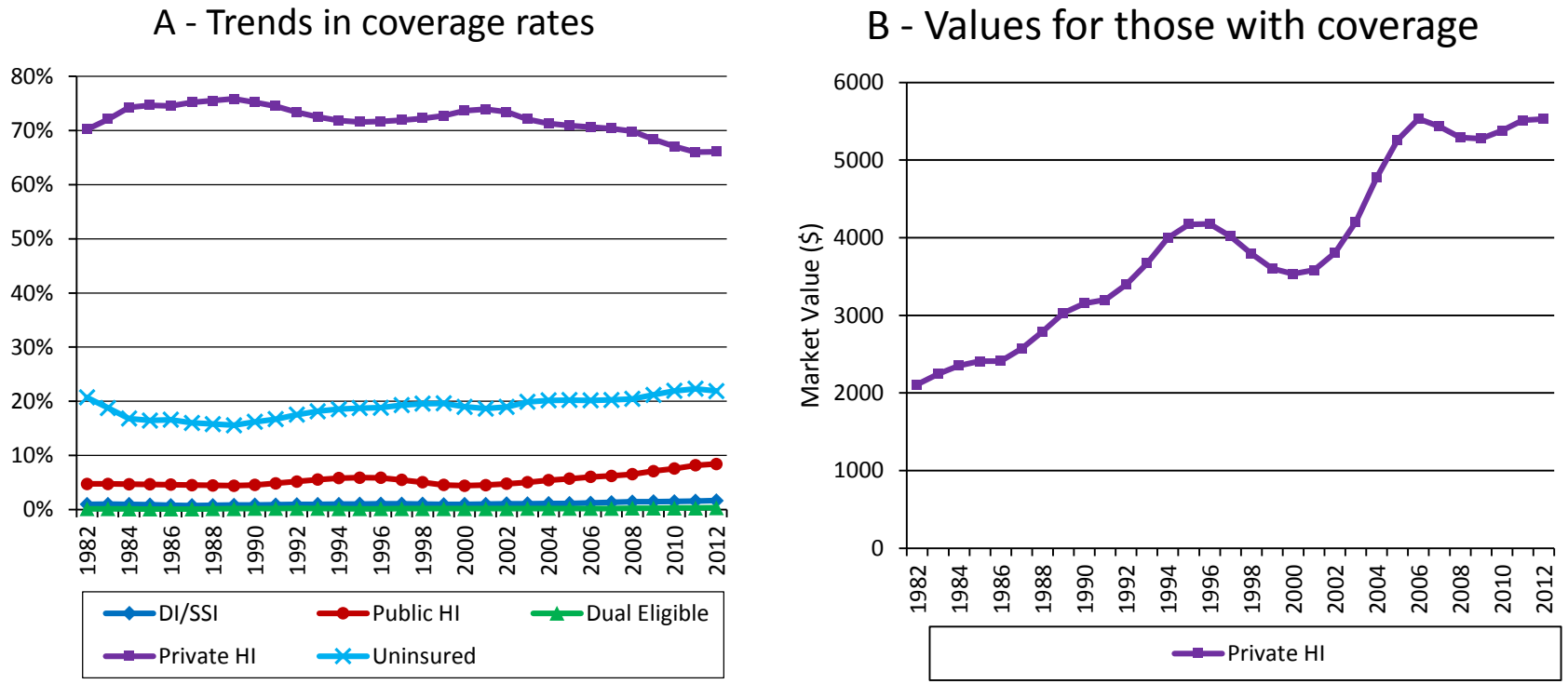
Figure 5 Methods

Figure 5 reports the percentage of all working-age persons who report a work limitation for each trough year over the analysis period within each working-age income quintile using disposable income plus the value of health insurance as the income measure. Our construction of the disposable income plus health insurance measure in Figure 5 is consistent with our construction of the values we report in Figures 3 and 4.

Table 1 Methods

Table 1 uses March CPS data for income years 1983, 1993, 2004, and 2011. These are each trough years of business cycles. In Column 1 it reports the mean gross pre-tax household-size adjusted income of working-age people with and without disabilities in each of these years in 2010 dollars. In the next nine columns it reports each of nine income source components defined above. In the final column it reports total household taxes paid by the household. To account for economies of scale in household production, household income is divided by the square root of the number of persons in the household. All incomes are subsequently adjusted to 2010 dollar amounts using the Consumer Price Index Research Series (CPI-U-RS). The sources of income used in Table 1 are the same as those used in Figure 3.

*Appendix Figure 1A – Trends in public and private health insurance coverage and disability-based cash transfers and their value for working-age people without disabilities (1980-2012)*




*Source:* Author's estimation from March CPS data.

*Notes:* Yearly values are three-year moving averages with 1982 being the mean value of 1980-1982. Prevalence rates of working-age (18-64) people with disabilities covered by Medicare or Medicaid (Public HI), Medicare and Medicaid (Dual Eligible), and employer-provided health insurance (Private HI), those not covered by these sources of health insurance (Uninsured), and those receiving Social Security Disability Insurance or Supplemental Security Income (DI/SSI) benefits.

*Appendix Table 1A. Demographic Characteristics of People with and without Disabilities*

| Year | N | Weighted N | Age | Male | White | Full Time | Part Time | Householder | Married | Receive SSI/DI |
|---|---|---|---|---|---|---|---|---|---|---|
| Panel A - Without Disabilities | | | | | | | | | | |
| 1983 | 90,571 | 132,735,786 | 36.75 | 0.49 | 0.83 | 0.48 | 0.33 | 0.78 | 0.73 | 0.01 |
| 1993 | 83,035 | 146,354,650 | 37.67 | 0.49 | 0.79 | 0.55 | 0.3 | 0.77 | 0.68 | 0.01 |
| 2004 | 116,471 | 167,580,422 | 39.37 | 0.49 | 0.74 | 0.59 | 0.25 | 0.77 | 0.64 | 0.01 |
| 2011 | 112,809 | 177,367,748 | 39.96 | 0.49 | 0.71 | 0.54 | 0.25 | 0.73 | 0.61 | 0.02 |
| Panel B - With Disabilities | | | | | | | | | | |
| 1983 | 6,999 | 10,365,064 | 46.92 | 0.51 | 0.79 | 0.13 | 0.22 | 0.8 | 0.61 | 0.27 |
| 1993 | 6,952 | 12,753,461 | 45.41 | 0.52 | 0.73 | 0.11 | 0.24 | 0.76 | 0.53 | 0.35 |
| 2004 | 9,461 | 14,536,005 | 46.85 | 0.49 | 0.71 | 0.09 | 0.18 | 0.75 | 0.46 | 0.44 |
| 2011 | 9,449 | 15,777,357 | 48.37 | 0.49 | 0.7 | 0.06 | 0.16 | 0.75 | 0.44 | 0.48 |

*Source:* Author's estimation from March CPS data.