

# Does Welfare Inhibit Success? The Long-Term Effects of Removing Low-Income Youth from Disability

## Insurance

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### Abstract

I estimate the effects of removing low-income youth with disabilities from Supplemental Security Income (SSI) on the level and variance of their earnings and income in adulthood. Using a regression discontinuity design based on a 1996 policy change, I find that removed SSI youth earn on average \$4,000 annually, an increase of just \$2,600 relative to those who remain on SSI, and the volatility of their income quadruples. Back-of-the-envelope calculations suggest that up to one-quarter of the value of SSI to recipients comes from its income stabilization effects and the other three-quarters from its income supplementation effects.

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# 1 Introduction

The debate over welfare programs reflects the tradeoff between consumption smoothing and moral hazard in social insurance. Supporters defend welfare programs as a vital lifeline for those who face barriers to work, while critics charge that these programs create perverse incentives to qualify and perpetuate dependency. Encapsulating this debate is the controversy over the U.S. Supplemental Security Income (SSI) program, a rapidly expanding disability program that provides cash payments and Medicaid eligibility to low-income children and adults with disabilities. SSI is now the largest cash welfare program in the United States, paying about \$50 billion each year to 8 million recipients, including 1.3 million children, or 10% of children living in poverty.<sup>1</sup> SSI has been singled out by policymakers and the media for potential perverse incentives, with critics arguing that it discourages educational achievement and human capital formation, especially in children and young adults.<sup>2</sup>

In this paper, I address two long-standing questions about SSI that reflect the broader debate over means-tested programs. First, how much does SSI inhibit labor market success and self-sufficiency among youth? There has been little work on the long-term effects of disability programs on children and youth, even though their formative stage of development might make them most vulnerable to any perverse incentives or discouragement of achievement.<sup>3</sup> Second, how much insurance does SSI provide to recipients? Empirical work on social insurance programs has thus far considered their effects on the *level* of earnings and income, but their effects on the *stability* of income are also relevant if recipients are risk averse. In the presence of risk aversion, a monthly stream of welfare payments is more valuable than earnings of the same average monthly amount if welfare payments are more stable. To be sure, the goal of social insurance is to reduce income risk across states, generally conceptualized as protection against permanent or long-term shocks like disability or falling into poverty. However, I argue that these programs may also protect against secular, transitory income fluctuations that are distinct from permanent shocks. Earnings volatil-

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<sup>1</sup>U.S. Congressional Budget Office, “Growth in Means-Tested Programs and Tax Credits for Low-Income Households,” February 2013.

<sup>2</sup>See, e.g., Patricia Wen, “The Other Welfare,” *Boston Globe*, December 12, 2010; U.S. Congress, House Subcommittee on Human Resources of the Committee on Ways and Means, Hearing on Supplemental Security Income Benefits for Children, October 27, 2011; and Nicholas Kristof, “Profiting from a Child’s Illiteracy,” *New York Times*, December 7, 2012.

<sup>3</sup>Several recent studies have examined the effects of adult disability programs on labor supply and human capital, including Bound (1989), Chen and van der Klaauw (2008), von Wachter, Song and Manchester (2011), Maestas, Mullen and Strand (2013), French and Song (2014), Moore (2015), and Autor, Maestas, Mullen and Strand (2015). Kubik (1999) and Coe and Rutledge (2013) study children with disabilities.

ity is especially relevant for low-income populations whose employment opportunities are limited to jobs with high turnover and unpredictable hours.<sup>4</sup>

To answer these questions, I study the long-term effects of removing low-income youth with disabilities from Supplemental Security Income on the level and variance of their earnings and income in adulthood. I take advantage of a policy change in the Personal Responsibility and Work Opportunity Act (PRWORA) of 1996—more commonly known as welfare reform—that increased the number and strictness of medical reviews for 18-year-olds. The law applied only to children with an 18th birthday after August 22, 1996—the date of PRWORA enactment—creating a discontinuity in the likelihood of removal via age 18 medical review at that date. I implement a regression discontinuity design based on this change using administrative data from the Social Security Administration (SSA). To the best of my knowledge, this is the first paper to estimate the causal impacts of program removal on the large and critical population of youth with disabilities and to follow them over multiple decades. It is also the first to consider the effect of welfare and disability programs on income stability in addition to income levels.

I find that SSI youth who are removed from the program increase their earnings minimally and, as a result, experience a large drop in observed income levels. Removed SSI youth earn on average \$4,000 per year in adulthood, an increase of just \$2,600 relative to those who remain on SSI. This increase in earnings covers one-third of the \$7,700 they lose in annual SSI income, and they lose an additional 10% each year in Social Security Disability Insurance (DI) income because they are less likely to apply for DI. As a result, removed SSI youth lose on average \$73,000 in present discounted observed income over the following 16 years, which is 80% of the original SSI cash income loss. Even those in the top decile of the earnings response barely recover the full amount of the lost SSI income.

Despite the large average losses, removal does spur some SSI youth to earn at full-time, full-year levels. The likelihood of maintaining annual earnings above \$15,000—approximately the full-time minimum wage annual earnings level—increases by an average of 11 percentage points over the post-period, off of a near-zero baseline for those who remain on SSI. This effect also increases over time, which suggests that SSI removal may have long-term effects on earnings behavior, perhaps through skill accumulation or increased taste for work. How-

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<sup>4</sup>For example, [Edin and Lein \(1997\)](#) write that poor single mothers in their study “had to weigh the utility of work against the real possibility that a subsequent layoff or reduction in hours could lead to serious material hardship. The jobs these mothers could get were among the least reliable in the U.S. economy.”

ever, using survey and administrative data on the broader disadvantaged youth population, I find that removed SSI youth have lower earnings levels and lower earnings growth than their disadvantaged but non-disabled counterparts.

In addition to the fall in income levels, income volatility increases considerably as a result of SSI removal. The within-person coefficient of variation of income quadruples, putting average income volatility for removed SSI youth at the 90th percentile of the control group distribution. If recipients are risk averse and unable to smooth consumption intertemporally, then both the fall in income levels and the rise in income volatility from SSI removal have welfare consequences. I do back-of-the-envelope calculations of the welfare loss experienced by SSI youth from removal. Under various assumptions about the relationship between income and consumption for this population, I find that up to one-quarter of the recipient's welfare loss from SSI removal is attributable to the increase in income volatility and the other three-quarters to the fall in income levels.

The SSI context is a useful setting for studying the effects of welfare programs for several reasons. First, SSI is the largest cash welfare program in the United States, with annual expenditures more than double those of the Temporary Assistance to Needy Families (TANF) program.<sup>5</sup> Second, the effects of SSI may be particularly consequential for SSI youth because they are at risk for poor life outcomes. SSI children grow up in households with incomes near or below the poverty line, generally with fewer than two parents. Mental conditions other than intellectual disability—including ADHD, speech delay, and autism spectrum disorder—have accounted for nearly all of the expansion in the SSI children's program in the past two decades and now constitute the primary diagnosis for the majority of SSI children. SSI youth with mental conditions other than intellectual disability have school drop-out rates of 45%, school suspension rates of 52%, and arrest rates of 28% (Hemmeter, Kauff and Wittenburg (2009)). Their outcomes do not improve substantially in adulthood: former SSI children have employment rates of just 20-50% as adults, depending on the cohort (Davies, Rupp and Wittenburg (2009)). Third, SSI is a relevant context for studying the income stabilization effects of welfare and disability programs because the SSI population is a low-income, low-education population whose employment opportunities are restricted to jobs with high turnover and unpredictable hours. The bottom quintile of the earnings distribution in the United States has a within-person earnings volatility (as measured by

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<sup>5</sup>Congressional Budget Office, "Growth in Means-Tested Programs and Tax Credits for Low-Income Households," February 2013.

the coefficient of variation) more than double that of the middle quintile.<sup>6</sup> Therefore the primary alternative source of income for the SSI population is highly volatile earnings.

The findings in this paper inform long-standing issues in the debate over welfare programs. With respect to whether SSI inhibits labor market success and self-sufficiency, I find that most SSI youth would earn well below subsistence levels if removed from SSI. I find no evidence for the hypothesis that SSI holds most recipients back from self-sufficiency or that removing even relatively healthy SSI recipients would make them better off in the long run. Instead, removing SSI youth leads to a large reduction in observed lifetime income and a large increase in the volatility of that income. With respect to the level of insurance provided by SSI, I find that SSI affords a greater amount of insurance than suggested by previous analyses because of its income stabilization benefits. Ignoring the income stabilization benefits of disability programs, and possibly other social insurance programs, could substantially underestimate their value to recipients.

The paper proceeds as follows. Section 2 describes the administrative data from the Social Security Administration used in this paper, provides background on the SSI program, and outlines the empirical strategy based on changes in the welfare reform law. Section 3 presents estimates of the first stage for SSI enrollment. Section 4 presents and discusses IV estimates for earnings and income levels, and Section 5 presents and discusses IV estimates for income volatility. In Section 6, I consider the effect of SSI removal on the welfare of the individual recipient and on social welfare. Section 7 concludes.

## 2 Data, background, and empirical strategy

### 2.1 Data

I use confidential administrative data from the Social Security Administration. The Supplemental Security Record (SSR) provides demographic information on SSI children, including date of birth, sex, county code, primary and secondary diagnosis, application date(s), and decision date(s). The extract also includes monthly benefit history information starting from the inception of the program in 1974 up to 2013, including monthly payment status code and benefit amount. The SSR also identifies the parents of SSI children since SSA uses parental income and assets to determine the child's benefit amount.

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<sup>6</sup>Author's calculations from the Continuous Work History Sample.

I link SSR records to the Continuing Disability Review Waterfall File. This file gives information on medical reviews for children and adults, including age 18 medical reviews going back to 1996. Each medical review observation lists demographic information for the reviewed recipient and the date and outcome of the case at each level of adjudication.

I link children to their long-term outcomes using several Social Security Administration databases. From an extract of the Master Earnings File (MEF), I observe earnings for each individual in each year up to 2012. These earnings include wage, salary, and tip income reported on W-2 and W-3 forms and self-employment income reported on 1040 Schedule SE forms. The Detailed Earnings File gives one record per worker per employer per year. The 831 Records provide information on SSI and SSDI applications up to 2013, and the Master Beneficiary Record (MBR) gives benefit history information for the SSDI program up to 2012. The Numident file documents date of death. Since the SSR identifies the parents of SSI children, I use the same data sources (MEF, 831, MBR, SSR, and Numident) to link children to their parents' earnings, SSI and SSDI applications, SSI and SSDI benefit receipt, and mortality. By linking SSR child records with the same parent, I also observe SSI application and receipt for siblings of SSI children as well as the adult earnings of siblings who are themselves on SSI at some point.

Although SSI in most states provides categorical Medicaid eligibility, SSA administrative data do not include information on Medicaid enrollment or utilization. Instead, I do a back-of-the-envelope calculation for Medicaid enrollment following the age 18 medical review using estimates from [Hemmeter \(2011\)](#). I then use estimates of the value of Medicaid from [Finkelstein, Hendren and Luttmer \(2014\)](#) and the 1997 Current Population Survey and inflate or deflate these numbers using the Bureau of Economic Analysis Health Deflator.

Finally, I use a number of other data sources to put my findings on SSI youth in context. Using the 2008 panel of the Survey of Income and Program Participation, I compare the characteristics of households with SSI children to the characteristics of all households with children and disadvantaged households with children. I use the Continuous Work History Sample (CWHS), an administrative dataset of the earnings of a 1% sample of Americans, to calculate the volatility of earnings for different parts of the broader U.S. earnings distribution. I use the National Longitudinal Survey of Youth-1997 (NLSY97) and SSA administrative data on denied child applicants to track the evolution of earnings in broader disadvantaged populations. I use the Bureau of Labor Statistics Consumer Expenditure Sur-

vey to determine a reasonable consumption floor for the low-income population. In addition, I tabulate descriptive statistics on the SSI youth population from the National Survey of SSI Children and Families (NSCF), including living arrangements, family transfers, public assistance, and educational achievement. I use county unemployment rate in 1997 and county poverty rate in 1999 from the Bureau of Economic Analysis Regional Economic Accounts and the U.S. Census Bureau, respectively.

## 2.2 Background on the SSI program and SSI children

SSI provides monthly cash payments to children and adults who qualify on the basis of disability or old age and have limited income and assets. The maximum federal benefit amount for an individual was \$721/month (\$8,652/year) in 2014, and most states provide a small supplement. SSI also makes recipients eligible for Medicaid in most states.

From my analysis of the 2008 Survey of Income and Program Participation panel, presented in Appendix Table A.1, households with SSI children are disadvantaged by nearly every measure. Annual earnings are less than one-third of earnings for all households with children, and total household income is approximately one-half. SSI-child households are twice as likely to be black, and the head of household is twice as likely to be a single mother and a high school dropout. Even relative to low-education households, SSI-child households have 50% lower earnings and 20% lower total income and are two-thirds more likely to be headed by a single mother. Nearly 80% of SSI-child households receive free or reduced-price lunch, compared to 54% for low-education households, and income from cash transfers is more than seven times larger in SSI-child households.

Under current law, SSI children must requalify for the program as adults by undergoing an age 18 medical review. About 40 percent of all SSI children and two-thirds of SSI children with mental conditions other than intellectual disability are currently removed from SSI at the age of 18 (Hemmeter and Gilby (2009)). These high cessation rates can be attributed to differences in medical eligibility criteria between the child and adult SSI programs. In the adult disability programs, disability is defined as an inability to work. Adults who earn above the “substantial gainful activity” limit (\$1070/month for non-blind individuals in 2014) are ineligible for disability benefits. Since children do not work, their eligibility for the SSI program is based on age-appropriate activity. Children must have “marked and severe functional limitations” that limit their activities, which can include social interaction

and school performance.<sup>7</sup> Conditions such as ADHD and other learning disabilities may qualify a child for SSI because they limit age-appropriate activity, but they are less likely to qualify an adult unless they are severe enough to prevent work. Children who qualify on the basis of these conditions are more likely to be removed at 18.

In the SSI children's program, the income and assets of the parents are used to determine both financial eligibility and monthly benefit amount. Once a child turns 18, however, only the child's own income and assets are considered. The maximum monthly SSI benefit amount (\$721 in 2014) is reduced based on income. SSI work incentives treat earned income more generously than unearned income. The monthly benefit is reduced by \$1 for every \$1 of unearned income (after a \$20 exclusion), but by only \$1 for every \$2 of earned income (after a \$65 exclusion). This puts the annual break-even point for earned income at about \$18,000. SSI recipients are generally terminated after 12 consecutive months of having a zero benefit amount. Certain public assistance benefits like SNAP (food stamps) are not considered income for SSI purposes. The SSI asset limit is \$2,000 for an individual and \$3,000 for a couple and excludes the value of a home and one vehicle.

### **2.3 Welfare reform policy change**

SSI was established by Congress in 1972 and experienced rapid expansion after the relaxation of adult disability criteria in 1984. In 1990, the Supreme Court decision in *Sullivan v. Zebley* also relaxed medical eligibility criteria for children. Child enrollment in SSI surged after the decision, with nearly all of the growth coming from mental conditions other than intellectual disability, including ADHD, speech delay, and autism spectrum disorders (Appendix Figure A.1). As part of welfare reform in 1996, Congress enacted changes to the SSI children's program to limit entry onto the program and to remove children believed to have been allowed improperly.

I take advantage of changes to the SSI program enacted as part of welfare reform to identify the effect of SSI on the long-term outcomes of transition-age youth. The Personal Responsibility and Work Opportunity Act (PRWORA) of 1996 made two changes to age 18 medical reviews, in which a disability examiner decides whether an SSI child qualifies for the program as an adult. First, it required the Social Security Administration to redetermine the eligibility of all SSI children at the age of 18, up from virtually zero age 18 medical

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<sup>7</sup>Social Security Act Sec. 1614, 42 U.S.C. 1382c(a)(3).

reviews previously. Second, it increased age 18 medical review eligibility requirements to use the stricter adult standard rather than the child standard. Prior to the legislation, SSI children who did receive age 18 medical reviews were continued on SSI as adults as long as they did not demonstrate medical improvement, whether or not they met the adult disability standard. PRWORA instead required all SSI children to re-qualify for the program as adults. Importantly for my empirical strategy, these changes in the number and strictness of age 18 medical reviews applied only to children with an 18th birthday after August 22, 1996, which was the date of PRWORA enactment.

Figure 1 summarizes the empirical strategy for this regression discontinuity (RD) design in date of birth. The x-axis shows the date of the child’s 18th birthday, with a vertical line at the August 22, 1996, cutoff. The graph plots the proportion of children in each birthweek bin who receive an age 18 medical review, receive an unfavorable age 18 medical review, and ever (up to age 35) receive an unfavorable medical review. The figure confirms that the PRWORA changes were enforced: while almost no children with an 18th birthday immediately before the cutoff (hereafter, “control” group) received an age 18 medical review, nearly 90 percent of children with an 18th birthday immediately after the cutoff (“treatment” group) received one.<sup>8</sup> This discontinuity in the likelihood of receiving an age 18 medical review translates into a 39 percentage point discontinuity in the likelihood of receiving an *unfavorable* age 18 medical review. Age 18 medical reviews are a specific type of the more general medical reviews used to verify continued eligibility for both adults and children. As shown in Figure 1, children with an 18th birthday after the date of PRWORA enactment are 28 percentage points more likely to ever receive an unfavorable medical review until the last time I observe them at age 35. This discontinuity is smaller than the previous ones since children on the left hand side of the graph, who do not receive an age 18 medical review, are more likely to continue on SSI as adults and receive adult medical reviews.

The first column of Table 1 presents summary statistics. The sample is majority male, which is consistent with higher disability diagnosis rate among boys, and the average age at entry is 11.4 years. Mental conditions are by far the most common diagnosis, with 49% of the sample having an intellectual disability and 25% having a mental condition other than intellectual disability. As expected for a means-tested program, sample members come from very low-income households, generally with fewer than two parents. Average annual parental

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<sup>8</sup>Most of the 10% of children with an 18th birthday after the cutoff who did not receive an age 18 medical review had already been flagged for other violations.

earnings between 1980 and 1996 for those with parents are \$9,592 and the median is \$4,121. Households receive a large amount of disability income relative to earnings, even excluding the youth’s SSI payment. Approximately half of sample members come from a household with a single mother. Another 16% have no parents on their record; these include children in foster care, children living with other relatives, and children living in institutions.

## 2.4 Covariate balance and econometric specification

I use the discontinuity in birthdate to identify the effect of SSI removal on the long-term outcomes of SSI children. The key identifying assumptions of the regression discontinuity design are that assignment to the treatment is as good as random immediately around the cutoff and the outcome variable is counterfactually smooth across the cutoff. To test these assumptions, I use a parametric RD specification to examine whether the instrument predicts observable covariates for children around the cutoff:

$$Y_i = \alpha + \beta \text{Post}_i + \gamma \text{DOB}_i^n + \kappa(\text{Post}_i \times \text{DOB}_i^n) + \epsilon_i \quad (1)$$

where  $Y_i$  is a covariate for child  $i$ ;  $\text{Post}_i$  is a dummy for having an 18th birthday after the August 22, 1996, cutoff; and  $\text{DOB}_i^n$  is the date of birth running variable of polynomial order  $n$ .

Using a linear specification, I find that covariates are imbalanced at the August 22, 1996, cutoff under the standard regression discontinuity design. As shown in Table 2, SSI children with an 18th birthday immediately after the cutoff enter the program earlier and have lower pre-treatment earnings, lower pre-treatment parental earnings, and higher pre-treatment SSI payment. The same imbalances appear at the August 22 cutoff in the two neighboring years, 1995 and 1997 (Appendix Table A.2), suggesting that the imbalances are the result of seasonality. Using a quadratic specification, in contrast, the discontinuities shrink in all years and the F-test fails to reject the null hypothesis of covariate balance (Appendix Table A.3). Non-parametric local linear regression estimates show discontinuities in the same variables, though the F-test fails to reject for smaller bandwidths because of large standard errors (Appendix Table A.4). Covariate graphs for all three years are given in Appendix Figures A.2-A.4.

To account for potential seasonality in both observables and unobservables, I augment

the standard regression discontinuity design by differencing out the discontinuity in neighboring years (1994, 1995, and 1997) from the discontinuity in 1996.<sup>9</sup> This regression discontinuity/difference-in-differences (RD-DD) design compares the discontinuity for the 1996 cohort to the discontinuity for comparison cohorts in 1994, 1995, and 1997 that were not affected by the PRWORA change, thereby netting out any effects of seasonality from the estimates. The RD-DD specification is identical to the standard RD in equation (1) except that it interacts a dummy for the 1996 cohort with each variable:

$$\begin{aligned}
 Y_i = & \alpha_0 + \beta_0(\text{Coh96}_i \times \text{Post}_i) + \gamma_0(\text{Coh96}_i \times \text{DOB}_i^n) + \kappa_0(\text{Coh96}_i \times \text{Post}_i \times \text{DOB}_i^n) \\
 & + \alpha_1\text{Coh96}_i + \beta_1\text{Post}_i + \gamma_1\text{DOB}_i^n + \kappa_1(\text{Post}_i \times \text{DOB}_i^n) + \epsilon_i.
 \end{aligned}
 \tag{2}$$

Table 2 shows the covariate balance tests for the RD-DD design under both a linear and quadratic specification. Compared to the linear RD specification, the linear RD-DD specification yields somewhat smaller discontinuities, but some discontinuities remain and the p-value on the omnibus F test remains marginally significant. The quadratic RD-DD, however, completely eliminates the discontinuities in the covariates.<sup>10</sup> I report the main results using the quadratic RD-DD with standard errors clustered at the individual level. However, the estimates are robust to using a standard RD with a polynomial order greater than one, to the RD-DD with different polynomial orders, and to non-parametric estimation (see Appendix Tables A.6-A.15).

The sample is SSI children with an 18th birthday around the August 22 cutoff in 1996 and the comparison years (1994, 1995, and 1997). With a 37-week (260 day) bandwidth, the sample includes 81,800 children from the 1996 cohort and 219,089 children from the comparison cohorts.

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<sup>9</sup>I exclude 1998 as a comparison year because it contains another (smaller) discontinuity in age 18 medical reviews by birthdate as a result of a different policy change.

<sup>10</sup>The quadratic RD-DD also performs best in the falsification tests, shown in Appendix Table A.5, that test for covariate balance at each day of the year. If covariates are balanced across the year then the rejection rate of the joint F test should approximately equal the significance level of the test. The linear and quadratic standard RD specifications massively over-reject in 1996 and in the neighboring years. The linear RD-DD also over-rejects, but not as badly as the individual years, and the quadratic RD-DD specification has “correct” rejection rates—approximately equal to the significance level.

### 3 First stage estimates for SSI enrollment

The causal relationship of interest is the effect of SSI removal on long-term outcomes:

$$Y_{it} = \alpha + \beta \text{SSIStatus}_{it} + \epsilon_{it} \quad (3)$$

where  $Y_{it}$  is the outcome of interest for individual  $i$  in year  $t$  and  $\text{SSIStatus}_{it}$  is a measure of SSI status in year  $t$ , the endogenous variable of interest. Based on the empirical strategy outlined in the previous section, I use having an 18th birthday after the August 22, 1996, cutoff as an instrument for being off of SSI. The first stage equation is equation (2) with covariates with the endogenous variable on the left-hand-side:

$$\begin{aligned} \text{SSIStatus}_{it} = & \alpha_0 + \beta_0(\text{Coh96}_i \times \text{Post}_i) + \gamma_0(\text{Coh96}_i \times \text{DOB}_i^n) + \kappa_0(\text{Coh96}_i \times \text{Post}_i \times \text{DOB}_i^n) \\ & + \alpha_1 \text{Coh96}_i + \beta_1 \text{Post}_i + \gamma_1 \text{DOB}_i^n + \kappa_1(\text{Post}_i \times \text{DOB}_i^n) + X_i + \epsilon_i \end{aligned} \quad (4)$$

The covariates in  $X_i$  include sex, diagnosis category, age at entry, pre-treatment parental earnings, and state.

What is the appropriate measure of the endogenous variable in this context?  $\text{SSIStatus}_{it}$  could be measured as removal via age 18 medical review, number of years spent on or off of SSI, or contemporaneous SSI enrollment, among other possibilities. In this context, there is a tradeoff between the meaningfulness of the interpretation of an endogenous variable and the strength of the assumptions required to meet the exclusion restriction. The exclusion restriction holds that the instrument—having an 18th birthday after the cutoff—affects the outcome only through the endogenous variable. Using removal via age 18 medical review involves the least stringent assumptions to meet the exclusion restriction because all effects from the birthdate cutoff likely operate through removal. However, this endogenous variable is difficult to interpret because its effects depend on the likelihood of leaving or re-entering the program in the future, which varies based on current SSA policy and funding. In contrast, contemporaneous SSI enrollment has a straightforward and meaningful interpretation: the effect of being off of SSI in a given period on that period’s outcomes. The disadvantage is that it requires the stronger assumption that the birthdate cutoff has negligible effects on outcomes through channels other than contemporaneous enrollment, such as the past history of SSI enrollment. I report results using both removal via age 18 medical review

and contemporaneous SSI enrollment, but I focus on the latter variable in the discussion for ease of interpretation. I find in robustness checks that using cumulative years on SSI as the endogenous variable gives nearly identical results to using contemporaneous SSI enrollment since these two endogenous variables are highly co-linear (Appendix Figure A.10).

### 3.1 First stage results

Recall from Figure 1 the first stage effect on removal via age 18 medical review: having an 18th birthday after the cutoff increases the likelihood of receiving an unfavorable age 18 medical review by 39 percentage points. Figure 2 plots the RD-DD estimate for SSI enrollment estimated separately for each year using equation (4); the first stage graph for event year 4 is given as an example in Appendix Figure A.5. As expected from quasi-random assignment, there is no difference between the control and treatment groups in the probability of SSI enrollment prior to age 18. The difference between the control and treatment groups does not open measurably until two years after the year of the child’s 18th birthday as a result of lags in decision time.<sup>11</sup> The first stage reaches a maximum four years after the child’s 18th birthday, with the treatment group 24 percentage points less likely to be enrolled in SSI than the control group. After that, the first stage effect attenuates rapidly and eventually plateaus at 5 percentage points.

I find that most of the attenuation is attributable to control group members leaving the program in large numbers as adults, with 44% exiting by 2013 (Appendix Figure A.6). The most common reasons for control group exit are removal via adult medical review (15% of all control group members), income and asset violations (13%), incarceration (7%), and death (5%). Some treatment group members return to the program after removal, but this proportion is much smaller, reaching 15% by 2013. Note that control group exit is also the reason that the first stage magnitude peaks at 24 percentage points rather than the 40 percentage points predicted by the unfavorable age 18 review estimates in the previous section. The Appendix discusses the characteristics of the “complier” population that identifies the local average treatment effect and how this population changes over time. In Section 4.2, I discuss how the changes in the first stage over time affect the interpretation of the IV estimates. These changes also highlight the usefulness of using SSI enrollment as the

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<sup>11</sup>The median decision time from the child’s 18th birthday is roughly three-quarters of a year overall, but it increases to 1.4 years for the 22% of cases that made it to the first appeals stage (reconsideration) and 2.4 years for the 10% of cases that made it to the second appeals stage (administrative law judge).

endogenous variable. Removal via age 18 redetermination had less impact on future SSI status in the post-PRWORA era than it would have at other times since SSA also removed more adults than usual via adult medical review during this time.

## 4 IV estimates for earnings and income levels

### 4.1 Estimating the earnings and income response to removal

Figure 3 presents the reduced form graph for annual earnings in adulthood. SSI youth who have an 18th birthday after August 22, 1996, earn on average \$320 more per year than those who have an 18th birthday before the cutoff. The estimate is marginally significant. For a more meaningful interpretation, Figure 4 presents the IV estimates for the SSI income loss in each year juxtaposed with the average earnings response in each year, using SSI enrollment as the endogenous variable. SSI youth who are removed from the program after an age 18 medical review lose \$7,700 per year, which is close to the maximum annual SSI benefit. SSI youth who remain off of SSI for the next 16 years lose approximately \$115,000 in SSI income, or \$90,000 in present discounted value.<sup>12</sup>

Removed SSI youth increase their earnings by a statistically significant \$2,600 annually, or approximately one-third of the SSI cash benefit loss (ignore the dashed “re-weighted” line for now). This earnings response represents a 62% increase over the control group mean of \$4,200. Those who are removed increase their earnings by \$29,000 in present discounted value earnings over the 16-year post-period. The main IV estimates are given in Table 3, including for the alternative endogenous variable of removal via age 18 medical review. The earnings IV estimate of \$750 for this endogenous variable is smaller than the estimate using SSI enrollment because many members of the control group leave SSI in adulthood.

The flatness of the earnings response over time in Figure 4 is striking. Despite larger standard errors over time, the point estimates remain fairly constant throughout the post-period. The major exception is the fall in year 14, which corresponds to 2008, the year of the Great Recession.

In addition to mean earnings, another informative measure of the earnings response is the likelihood of having positive earnings or earning at a full-time, full-year level. SSI removal

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<sup>12</sup>I do not observe effects on Medicaid enrollment, but I present back-of-the-envelope calculations in the Appendix.

increases the likelihood of having positive earnings by 24 percentage points averaging over the next 16 years, an increase of 60% relative to the control group mean. Removal increases the likelihood of earning above \$15,000—approximately the full-time, full-year minimum wage level—by 11 percentage points, which is more than double the control group mean. In contrast to the flatness of the mean earnings response, the higher earnings thresholds exhibit an upward trend over time (Appendix Figure A.7). This evolution of the earnings response suggests that the earnings potential of those who are removed increases over time relative to those who remain on SSI, at least for some fraction of SSI youth at the higher end of the earnings distribution. Potential explanations for this increase include gains in labor market experience and skills as well as changes in preferences for work relative to those still on SSI, but my data do not allow me to distinguish between these explanations.<sup>13</sup>

I also examine heterogeneity in the earnings response by subgroup, with results in Table 4. Greater parental resources—as measured by parental earnings and family structure—are associated with a larger earnings response by SSI youth to removal from SSI. The earnings response of SSI youth in the lowest pre-treatment parental earnings quintile is close to zero, while SSI youth in the second-highest parental earnings quintile increase their earnings by a statistically significant \$5,800 each year, which is approximately three-quarters of the lost SSI income (Appendix Figure A.8). In contrast, I find little heterogeneity in the earnings response with respect to health status or local economic conditions. One explanation for the limited heterogeneity by subgroup is that the compliers across categories are more similar to each other than the average SSI youth across categories. Another explanation for the lack of heterogeneity is that the human capital of SSI youth is so low to begin with that neither better health nor a tight labor market improves their earnings prospects.

The absence of heterogeneity across observable subgroups does not rule out the possibility of heterogeneous responses, as argued by Bitler, Gelbach and Hoynes (2014). I estimate quantile RD IV treatment effects for earnings using the estimator proposed by Frandsen, Frölich and Melly (2012).<sup>14</sup> Note that quantile estimation does not measure changes for particular *individuals* in the earnings and income distribution, but rather for particular *percentiles* of that distribution. I find a large degree of heterogeneity in the earnings response

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<sup>13</sup>As another approach to measuring long-term effects, I estimate the effect of cumulative years off of SSI on earnings, with results shown in Appendix Figure A.10. The effect is constant over time, with one additional year off of SSI increasing cumulative earnings by about \$2,200 per year. This parameterization of the earnings response suggests limited long-term effects on average, consistent with the mean earnings graph in Figure 4.

<sup>14</sup>I implement this estimator using Melly (2014)'s "rddqte" Stata command.

across different parts of the distribution (Appendix Figure A.9). The increase in the lowest two deciles is a full order of magnitude smaller than the nearly \$10,000 increase in the highest decile. Consistent with the earnings threshold results, the quantile IV estimates suggest that removal induces some SSI youth to earn at full-time, full-year levels.

Removal may also affect whether SSI youth apply for and receive Social Security Disability Insurance (DI) benefits. DI has the same medical requirements as SSI but requires a work history and pays a benefit amount based on past earnings. Since SSI removal increases work activity, and DI work history requirements are low for young workers, removed SSI youth may be more likely to have the work history to qualify for DI.<sup>15</sup> On the other hand, removal from SSI may discourage removed youth from applying for DI since the medical criteria are the same. I find that SSI youth who are removed from SSI submit a total of 0.73 fewer DI applications than those in the control group over the next 16 years, a 100% reduction from the control group mean (see Appendix Figure A.11). This discouragement effect decreases DI receipt among the removed by a marginally significant \$730 per year (see Appendix Figure A.12). Although this loss is only 10% of the SSI cash income loss, it is a 100% reduction in DI benefits from the baseline, meaning that those who are removed from SSI lose all of their potential DI income. The present discounted value of the DI income loss is \$12,000 over 16 years.

I aggregate all observable measures of income—earnings, SSI income, and DI income—into one measure of total observed income. SSI youth lose on average \$6,100 per year in total observed income as a result of the SSI loss. The observed income loss totals \$73,000 in present discounted value over 16 years, which is 80% of the original SSI income loss. Of course, there are several potential sources of income that I do not observe, including transfers from family members, non-disability public assistance, and unreported earnings. In Section 6, I use survey and administrative data to consider each of these unobserved income sources. The Appendix reports results from administrative data for parental earnings and the earnings of younger siblings in adulthood.<sup>16</sup>

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<sup>15</sup>Workers under the age of 24 qualify with 1.5 years of work. Workers between 24 and 31 qualify with a work history of half the time between age 21 and the onset of disability.

<sup>16</sup>I also estimate mortality effects but the results are too imprecise to be meaningful.

## 4.2 Adjusting for complier composition and probing robustness

Recall from Figure 2 that the first stage effect on SSI enrollment changes considerably over time. If these changes reflect nonrandom entry and exit, then the composition of the compliers—those control group members who stay on SSI and those treatment group members who stay off of SSI—will change over time. In this case, the evolution of the year-by-year IV estimates would reflect not only true changes in the earnings response over time but also changes in the composition of the complier population over time. In the complier analysis in the Appendix, I find that the members of the control group who leave SSI in adulthood are healthier and wealthier than those who remain on SSI.

I adjust for this selection problem by re-weighting the IV estimates over time to reflect the same reference population, following the methodology in Angrist and Fernandez-Val (2010). The basic method is as follows: identify the observable characteristics which differ across the complier populations and have predictive power over reduced form outcomes, divide the sample into cells based on these characteristics, estimate the earnings response within each cell, and take a weighted average of the IV estimates across the cells, where the weights are the composition of the reference population. Formally, the calculation is

$$\hat{\beta}_{t,rewrite} = \sum_c \omega_c \hat{\beta}_{t,c}$$

where  $\hat{\beta}_{t,rewrite}$  is the re-weighted IV earnings estimate in year  $t$ ,  $\omega_c$  is the proportion of the reference population in cell  $c$ , and  $\hat{\beta}_{t,c}$  is the IV estimate for earnings in year  $t$  within cell  $c$ . I construct cells based on diagnosis and parental earnings because both change over time in the complier population (as shown in Table 1) and parental earnings are predictive of the youth's earnings response.

The dashed line in Figure 4 gives the complier re-weighted IV estimate for earnings in each year. Overall, re-weighting does not change the IV estimates for mean earnings substantially, nor are the differences statistically significant, but in later years the re-weighted estimates are somewhat larger than the unweighted estimates. This is the expected direction since control group members with high parental earnings have a larger earnings response and are more likely to leave SSI as adults. Of course, an important caveat is that this re-weighting exercise does not correct for unobservable differences across complier populations.

The attenuation of the first stage over time also affects the interpretation of the IV

estimates relative to the control group. The percentage changes in Table 3 are calculated relative to the control group mean. However, because many control group members leave SSI at a later date, the control group means understate the SSI income of the control group members who stay on SSI and overstate the earnings of this group. In Appendix Table A.16, I calculate the percentage changes in earnings and income relative to control group members who stay on SSI. As expected, the percentage increase in earnings increases substantially, from 62% relative to the full control group mean to 190% relative to the control group subset that stays on SSI. In addition, the estimated *level* of earnings for removed SSI youth falls substantially, from \$6,860 ( $= \$2,638 + \$4,222$ ) using the full control group mean to \$4,024 ( $= \$2,638 + \$1,386$ ) using the control group subset that stays on SSI. However, the nonrandom attrition of the control group from SSI means that the control group members who stay on SSI are a selected sample—as discussed earlier, their earnings capacity is likely to be lower than that of other control group members. The true control “complier” earnings mean is likely somewhere in between the mean of the full control group and the mean of the control subset that stays on SSI.

I also probe the robustness of the main parametric RD-DD estimates to different polynomial orders and covariates (Appendix Tables A.6-A.11), to standard RD estimation (Appendix Tables A.12-A.13), to non-parametric RD-DD estimation (Appendix Tables A.14-A.15), and to falsification tests using placebo cutoff dates (Appendix Figure A.13). For the parametric RD-DD and RD specifications, I report the polynomial order selected by two goodness-of-fit tests: the Akaike information criterion and the bin selection method outlined in Lee and Lemieux (2010). The results are highly robust to different specifications. The standard RD estimates are within 15% of the corresponding RD-DD estimates. The RD-DD estimates change only modestly with polynomial order, with estimates from the linear specification larger than, but statistically indistinguishable from, those from the quadratic specification. The non-parametric RD-DD estimates are within 30% of the parametric RD-DD estimates and do not vary substantially with bandwidth. The results are also robust to the inclusion of covariates. Finally, in the style of Chetty, Looney, and Kroft (2009), I construct the empirical CDF of RD estimates for earnings and income at placebo cutoff dates in 1995, 1996, and 1997 (Appendix Figure A.13). The true earnings RD estimate at August 22, 1996, is larger than 95.0% of the placebo estimates, and the true income RD estimate, which is negative, is smaller than 99.5% of the placebo estimates.

### 4.3 Comparing removed SSI youth to other disadvantaged youth

The IV estimates indicate that, on average, SSI youth have a small earnings response to being removed from the program and have low earnings levels in adulthood. In interpreting the results, it is informative to compare the earnings of removed SSI youth to the earnings of youth who come from similar low-income households but do not have disabilities. SSI youth come from very disadvantaged households—median reported parental earnings are just \$8,000 in the year of the child’s 18th birthday—and it might be that non-disabled youth of the same socioeconomic status perform just as poorly in the labor market. In Figure 5, I compare the labor market outcomes of removed SSI youth to the outcomes of two “disadvantaged but non-disabled” comparison groups. The first comparison group is youth from the National Longitudinal Survey of Youth-1997 (NLSY97) whose families were enrolled in the Aid to Families with Dependent Children (AFDC) program, a means-tested cash welfare program, during their childhood.<sup>17</sup> The NLSY97 youth are similar in age to the SSI youth in my sample, with years of birth between 1980 and 1984. The second comparison group is denied child SSI applicants from SSA administrative data, since families that apply for SSI are likely to be disadvantaged but the child was deemed too healthy to qualify for SSI.

Perhaps the most striking feature of Figure 5 is the flatness of the earnings trajectory of SSI youth juxtaposed with the earnings growth, however modest, of the comparison groups. By age 30, mean earnings are \$17,800 for the NLSY97-AFDC group and \$14,000 for the denied SSI applicant group, compared to just \$5,900 for removed SSI youth. The gap is less stark at the upper end of the earnings distribution (Appendix Figure A.14). The proportion of youth earning above \$15,000 by age 30 is 46% for the NLSY97-AFDC group and 36% for the denied SSI applicant group; it is 31% for removed SSI youth.

These comparisons suggest that while a minority of removed SSI youth perform reasonably well in the labor market relative to their non-disabled counterparts, the majority of removed SSI youth fall far behind. The comparisons also provide insight into the long-term effects of SSI. From Figure 5, the earnings growth of removed SSI youth lags well behind that of the broader disadvantaged youth population in the first decade after age 18. For most SSI youth, SSI does not appear to substantially limit the potential earnings of those

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<sup>17</sup>I get comparable results using other proxies for disadvantaged households, such as food stamp receipt, any welfare receipt, and low parental education and income.

who stay on SSI in adulthood.

## 5 IV estimates for income volatility

If individuals are risk averse and unable to smooth consumption intertemporally, SSI may have effects on recipient welfare not only through income levels but also through income stability. To measure within-person intertemporal variation in income, I use the coefficient of variation of income:

$$CV_i = \frac{\sigma_i}{\mu_i}$$

where  $\sigma_i$  is the standard deviation of individual  $i$ 's income over post-treatment years 2 to 16 and  $\mu_i$  is mean income over the same time period. Dividing by the mean allows for a standardized measure of variation and reflects a model in which annual fluctuations of \$5,000, for example, are more harmful to an individual with an average annual income of \$10,000 than to an individual with an average annual income of \$100,000. I exclude event years 0 and 1 because these are the years immediately after the age 18 medical review, when SSI income permanently falls and earned income permanently rises for those who are removed. Since I am interested in measuring fluctuations rather than permanent changes, including the initial event years would artificially inflate the coefficient of variation.

Figure 6 depicts a striking increase in income volatility at the cutoff for the 1996 cohort. For those who are removed from SSI, the coefficient of variation of income increases from 0.682 to 1.846, a statistically significant increase of 170%. The average coefficient of variation of income for removed SSI youth falls above the 90th percentile of the control group distribution.

I probe the robustness of this result in various ways. First, I use de-trended income to avoid picking up secular earnings growth. Since the earnings trajectory is generally steepest during the early years in the workforce, large changes in earnings and income may not be indicative of the ups-and-downs that harm risk-averse individuals but rather of large “ups” due to skill accumulation and experience among those removed from SSI. To account for this possibility, I calculate the coefficient of variation of income using the change from the previous year *after* accounting for the secular upward trajectory of earnings and income over time.<sup>18</sup> The coefficient of variation of de-trended income increases from 0.458 to 1.850—

<sup>18</sup>To construct a measure of de-trended changes in earnings and income, I run the following regression for

almost identical to the case without de-trending, likely because in practice most SSI youth experience almost no earnings growth over time. In addition, the jump in the coefficient of variation of income is robust to excluding individuals with very low earnings—and thus potentially a very high coefficient of variation—by either imposing a lower bound on the denominator (average annual income) or using quantile regression evaluated at the median (see Appendix Tables A.6-A.9).

Second, I use the standard deviation of income instead of the coefficient of variation, so that variation is an absolute rather than relative measure. The linear specification yields a statistically significant increase of \$1,668, but the magnitude falls to \$531 and is no longer statistically significant in the quadratic specification. However, the standard deviation of log income (after converting observed incomes of \$0 to \$1) increases by a highly statistically significant 1.80 (110% increase) that is robust across specifications.

Third, I use percent change in income as another measure of income volatility. The average annual (absolute value) percentage change in income increases by 150% after removal, while the number of years experiencing an income drop of 50% or more from the previous year increases by 0.83. Both estimates are significant at the 1% level.

The increase in income volatility is the result of switching from stable SSI benefits as the primary source of income to volatile earnings as the primary source of income. (The coefficient of variation of *earnings* either falls or does not change, depending on the specification, suggesting that less stable earnings are not the cause of the increase in volatility.) I use the Continuous Work History Sample, which contains annual earnings from administrative tax data for 1% of the U.S. population, to compare earnings volatility by earnings level in the general population. Restricting to individuals in the CWHS of the same age as the SSI youth in my sample, I find that the individuals in the bottom quintile of average earnings have a coefficient of variation of earnings of 1.845 on average, compared to 0.704 for the middle quintile and 0.561 for the highest quintile. Therefore the primary alternative source of income for SSI recipients is likely to be highly volatile earnings. In fact, the 1.846

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each individual in my sample:

$$y_t = \alpha + \beta\tau_t + \epsilon_t$$

where  $y_t$  is the individual's earnings (income) in year  $t$  and  $\tau_t$  is an event year trend. The residual from this regression is a measure of de-trended earnings:

$$\tilde{y}_t = y_t - (\hat{\alpha} + \hat{\beta}\tau_t)$$

I construct the coefficient of variation using the de-trended  $\tilde{y}_t$ , which reflects the annual change in earnings after accounting for the time trend in earnings. It leaves the “undesirable” portion of earnings volatility: the part that reflects idiosyncratic shocks rather than a secular upward age-earnings trajectory.

average coefficient of variation of income for removed SSI youth is almost identical to the 1.845 earnings volatility figure for the CWSH bottom quintile.<sup>19</sup>

Using the Detailed Earnings Record, which breaks down an individual’s annual earnings by employer, I investigate the source of earnings volatility for removed SSI youth and find that both job turnover and within-job fluctuations play a role. SSI youth who are removed from the program hold on average 1.3 jobs per year. Year-to-year job turnover is high: in the average year, they experience the addition of 0.83 jobs and the loss of 0.81 jobs relative to the previous year.<sup>20</sup> This turnover explains part of the large annual fluctuations in total earnings, which average around \$3,000 in absolute value. Earnings changes associated with job additions and losses are \$6,900 on average, while within-job earnings fluctuations—through changes in hours or wages—are \$9,100 on average (both absolute values). These figures are both larger than the overall annual earnings change because they may offset each other; for example, the earnings loss associated with a job loss may be offset by an increase in earnings at an existing job.

## 6 Welfare implications

### 6.1 Considering the relationship between income and consumption

The results show that SSI removal causes a large drop in total observed income and a large increase in income volatility. The relevant questions for a normative assessment of the income drop are 1) whether it is off of a low or high baseline, and 2) to what extent it reflects a drop in total *consumption*. With respect to the first question, baseline income and consumption are likely to be quite low given that SSI is means-tested. Average annual parental earnings for my sample is \$10,000 in the year of the child’s 18th birthday and average observed household income (which includes parent earnings, parent SSI and DI payments, and sibling SSI payments) is \$16,000. Median parental earnings and household income are several thousand dollars lower.

The second question—whether the fall in observed income reflects a fall in consumption—

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<sup>19</sup>Morduch and Schneider (2014) also document substantial income volatility for poor households: poor households experience a large relative income drop (more than 25% of median income) every one in four months, compared to one in every five months for non-poor households.

<sup>20</sup>EINs can change when businesses incorporate or for other reasons. If treatment group members are more (less) likely to be employed by a business whose EIN changes, then I may slightly overstate (understate) the increase in job turnover.

involves a number of considerations. As noted by [Meyer and Sullivan \(2003\)](#), limited saving and dissaving in low-income populations mean that income may be a reasonable proxy for consumption for this group. However, it is possible that part of the lost SSI income is made up by sources of income that I do not observe, such as monetary and in-kind transfers from family members, non-disability public assistance, and unreported earnings. I consider each of these sources in turn.

With respect to family member transfers, I estimate from the National Survey of SSI Children and Families (NSCF) that 54% of youth between the ages of 22 and 24 years who were on SSI as children live with one or both parents; this proportion is higher for those still on SSI (60%) than those no longer on SSI (45%). Given the number of SSI youth potentially living with parents or receiving transfers, parents' response to the 18-year-old's removal is relevant to understanding effects on consumption. As shown in [Table 3](#) and discussed in the Appendix, I find that parents do not respond to the loss of their child's SSI income by increasing their earnings or unearned income.

With respect to non-disability public assistance, rates of welfare receipt estimated from the NSCF are nearly identical for those still on the program and those off the program, at around 10% for non-SSI cash welfare and 27% for Food Stamps. As expected, health insurance coverage is much higher for those still on SSI (96%) than for those no longer on SSI (52%), with most of the difference coming from Medicaid enrollment.<sup>21</sup> Of course, the NSCF estimates are descriptive and not causal.

With respect to unreported earnings, the very limited research on this topic suggests that unreported work is common in low-income communities but, with the exception of lucrative illicit activities, generally accounts for a modest share of a given individual's income. [Edin and Lein \(1997\)](#) estimate that 40% of single mothers receiving welfare benefits engage in some unreported work, and unreported earnings constitute 12% of income averaged over all single mothers receiving welfare.<sup>22</sup>

Taken together, this causal and descriptive evidence on unobserved sources of income—

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<sup>21</sup>These relatively low rates of welfare receipt (for a low-income population) are not surprising given that most non-disability public assistance in the United States is targeted at families with children and most SSI young adults do not live with children. In most states in the relevant time period, childless and noncustodial adults do not qualify for TANF or Medicaid; food stamps are limited to 3 months per 3 years for adults working less than 20 hours/week; and the maximum EITC for childless adults is \$500/year.

<sup>22</sup>[Venkatesh \(2009\)](#), describing the underground economy in poor urban communities, reports that unreported work is common but “never steady enough to ensure this income stream for an entire year.” For those hired off-the-books, “the work is really about survival, and it is doubtful that they are prepared to work full-time and pursue conventional employment paths.”

family transfers, other public assistance, and unreported earnings—suggests that unobserved income is unlikely to be a large or reliable source of income for removed SSI youth. The drop in observed income may therefore translate into a substantial, though perhaps smaller, drop in consumption.

The key question in interpreting the increase in income volatility is to what extent it translates into consumption volatility—in other words, to what extent the SSI population is able to smooth consumption over time. Many studies have documented low saving rates among the poor in the U.S., which suggests limited intertemporal consumption smoothing.<sup>23</sup> Fewer studies have examined credit constraints among the American poor, though there is evidence that credit is costly for very low-income families.<sup>24</sup> On the other hand, intra-household risk sharing may still allow for some consumption smoothing.

## 6.2 Considering effects on recipient welfare

In the standard labor economics problem, the agent faces a tradeoff between consumption and leisure and maximizes utility with respect to those variables subject to a budget constraint:

$$\max_{c,l} u(c, l) \text{ s.t. } pc = w(T - l)$$

where  $c$  is consumption,  $l$  is leisure,  $p$  is the price of the consumption good,  $w$  is the wage,  $T$  is the total available hours, and  $u_c > 0$  and  $u_l > 0$ . Under various assumptions outlined below, I use my estimates on income to approximate the recipient’s consumption ( $c$ ). The choice of work hours ( $T - l$ ) may be especially pertinent for individuals with disabilities if their disutility of work is high. Unfortunately, I do not observe any measures of the disutility of work in my data. Assuming that the disutility of work is positive, I will likely underestimate the recipient’s welfare loss from SSI removal by ignoring the effect of removal on work hours, since I find in Section 4 that removal increases earnings.

<sup>23</sup>Dynan, Skinner and Zeldes (2004) estimate annualized saving rates of 1% or less for the lowest income quintile in the United States, compared to 5-10% for the middle quintile. Meyer and Sullivan (2003) state that income and expenditures are approximately equal for low-income single mothers because “little saving and dissaving occurs for this group,” though income and consumption may still differ due to the services that flow from durable expenditures. Morduch and Schneider (2014) find a ratio of annual deposits to year-end balance of 50:1 for low- and middle-income Americans, meaning that there is little accumulation of saving across years.

<sup>24</sup>According to the FDIC (2014), 28% of households with incomes of less than \$15,000 have no bank account, and another 22% have a bank account but rely on alternative financial services like check cashing and payday lending. Even among banked households, Morduch and Schneider (2014) document costly strategies to smooth consumption, such as using overdrafts, varying on-time and late bill payments each month, and using short-term credit from friends or family and alternative financial services.

I define the “constant equivalent” as the guaranteed consumption amount that makes the recipient indifferent between receiving that amount in each period and receiving his actual, volatile consumption stream. The constant equivalent  $c_{CE}$  is implicitly defined as:

$$\frac{1}{T}[u(c_{CE}) + \beta u(c_{CE}) + \dots + \beta^{T-1}u(c_{CE})] = \frac{1}{T}[u(c_1) + \beta u(c_2) + \dots + \beta^{T-1}u(c_T)] \quad (5)$$

where  $c_t$  is actual consumption in year  $t$ , and  $T$  is the total number of periods (16 years). I use the constant equivalent, which is an analogous concept to the certainty equivalent, as a measure of recipient welfare. I assume a constant relative risk aversion (CRRA) utility function with coefficient of relative risk aversion  $\gamma$ :

$$u(c) = \frac{c^{1-\gamma}}{1-\gamma}$$

Note that in this utility function, consumption levels work through the  $c$  and consumption volatility works through the  $\gamma$ .

I use three measures of consumption that make different assumptions. In the first measure, I take consumption in each year to be the maximum of the recipient’s total observed income in that year and a consumption floor  $\underline{c}$ :

$$c_{1t} = \max(\text{earnings}_t + \text{SSI}_t + \text{DI}_t, \underline{c})$$

The assumption that consumption in each year equals income in that year might be reasonable for this low-income population, for the reasons discussed in the previous subsection. However, I follow the standard method (Brown and Finkelstein (2008); Hoynes and Luttmer (2011); Finkelstein et al. (2014)) of imposing a consumption floor to avoid utility values of negative infinity and to rule out implausibly low consumption levels.<sup>25</sup> Given that a substantial fraction of SSI children live with parents in young adulthood, I use a second measure of consumption in which I attribute one-third of the parent’s income in a given year to the recipient’s consumption:

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<sup>25</sup>To determine a reasonable consumption floor, I estimate the distribution of annual expenditures for the low-education and low-income population from the Consumer Expenditure Survey. The 10th percentile of per-capita annual expenditures is between \$2,000 and \$3,000 for households with heads with a high school education or less and households with income less than \$20,000. Therefore I choose consumption floor values ranging from \$1,000 to \$5,000. The proportion of the sample below \$3000 is 34% for  $c_{1t}$ , 20% for  $c_{2t}$ , and 17% for  $c_{3t}$ .

$$c_{2t} = \max(\text{earnings}_t + \text{SSI}_t + \text{DI}_t + \frac{\text{parent income}_t}{3}, \underline{c})$$

In the third measure of consumption, I vary the fraction of parental income included in the recipient's assumption based on the recipient's SSI status. As in  $c_{2t}$ , the recipient receives one-third of parental income if still on SSI, but now receives one-half of parental income if no longer on SSI:

$$c_{3t} = \begin{cases} \max(\text{earnings}_t + \text{SSI}_t + \text{DI}_t + \frac{\text{parent income}_t}{3}, \underline{c}) & \text{if on SSI at time } t \\ \max(\text{earnings}_t + \text{SSI}_t + \text{DI}_t + \frac{\text{parent income}_t}{2}, \underline{c}) & \text{if off SSI at time } t \end{cases}$$

This case models a situation in which parents are more likely to contribute (or contribute more), in either in-kind or monetary transfers, when the child is removed from SSI.

For each of the three consumption measures, I calculate the constant equivalent  $c_{CE}$  from equation (5) for each individual in the sample and put  $c_{CE}$  on the left-hand-side of equation (3), using average annual SSI enrollment over the post-period as the endogenous variable. Table 5 shows the constant equivalent loss from SSI removal under the three approaches, for different values of the risk aversion parameter  $\gamma$  and different values of the consumption floor ( $\underline{c}$ ). For a risk neutral individual ( $\gamma = 0$ ), who considers only the average consumption loss and not the volatility of consumption, the constant equivalent of the SSI loss when using only recipient income ( $c_{1t}$ ) ranges from \$3,600 to \$5,900, depending on the consumption floor, from a baseline of around \$9,000. For  $\gamma > 0$ , the loss is greater in constant equivalent terms because the individual considers both the fall in consumption levels and the increase in consumption volatility after removal. The constant equivalent loss from removal for  $\gamma = 2$  ranges between \$3,900 and \$7,800. Including a constant one-third fraction of parental income ( $c_{2t}$ ) reduces the estimated welfare loss by 20%. Including a fraction of parental income that varies based on SSI status ( $c_{3t}$ ) reduces the estimated welfare loss by 50%, since the increase in parental transfers partially offsets the loss in SSI income.

I use these calculations to approximate the amount of the recipient's welfare loss from SSI removal that is attributable to an increase in consumption volatility rather than to a decrease in consumption levels. For some  $\gamma > 0$ , the proportion of the welfare loss from

consumption volatility is:

$$\frac{(\text{Constant equivalent loss for } \gamma > 0) - (\text{Constant equivalent loss for } \gamma = 0)}{\text{Constant equivalent loss for } \gamma > 0}$$

For  $\gamma = 2$  using recipient income only ( $c_{1t}$ ), these calculations indicate that 8-23% of the welfare loss is attributable to the increase in consumption volatility rather than to the fall in consumption levels, depending on the consumption floor. The proportion of the welfare loss from consumption volatility falls to 4-16% when including a constant fraction of parental income ( $c_{2t}$ ) since the parent and child income streams smooth each other out to some extent. However, the proportion from volatility approximately doubles, to 20-35% of the welfare loss, using a variable fraction of parental income. This increase is driven by two factors: 1) the smaller consumption loss mechanically increases the proportion of the loss from volatility, and 2) parental income is more positively correlated with recipient income for recipients no longer on SSI. The results suggest that for reasonable values of risk aversion, ignoring the income stabilization benefits of SSI could lead to a substantial underestimate of the recipient's welfare loss from SSI removal.

Three other considerations deserve mention. First, these calculations do not consider the Medicaid loss from SSI removal. Based on estimates from [Finkelstein et al. \(2014\)](#), the Medicaid loss increases the magnitude of the constant equivalent loss by 15-30% for  $\gamma = 0$  and 25-50% for  $\gamma = 2$ . Second, these welfare calculations assume that adult SSI is a guaranteed benefit. As expected, the constant equivalent loss falls when I allow for exit from SSI in adulthood. Finally, these welfare calculations do not consider the variance *across* individuals in the extent of the consumption loss. For a concave utility function, the welfare loss for the representative agent who experiences the average income loss underestimates the welfare loss under heterogeneity. To calculate the welfare change under heterogeneous losses, I calculate the welfare loss for each quantile based on my quantile IV estimates from Section 4 and then calculate the average loss across quantiles assuming rank preservation. Relative to the representative agent, the welfare loss approximately doubles with heterogeneous losses for  $\gamma = 2$ .

Of course, the individual welfare loss from SSI removal is only one input into the question of how SSI affects *social* welfare. In the Appendix, I consider the inputs provided by my estimates into a comprehensive social welfare analysis and the additional inputs needed for

such an analysis.

## 7 Conclusion

I study the long-term effects of removing SSI youth from the program using a regression discontinuity design based on a 1996 welfare reform change, paired with administrative data from the Social Security Administration. Of the \$90,000 they lose in present discounted SSI income over the 16-year post-period, they recover \$29,000 in earnings and lose an additional \$12,000 in DI income. In addition to the fall in observed income levels, the volatility of income quadruples as a result of the SSI loss.

The results of this paper inform long-standing questions surrounding the effects of SSI and welfare programs more broadly. With respect to the question of whether SSI inhibits self-sufficiency and labor market success, I find that most SSI youth who are removed have a small earnings response and minimal earnings growth over time. Note that these findings contrast with evidence of the effect of the 1996 welfare reform law on single mothers. The general consensus of that literature (see, e.g., [Blank \(2008\)](#)) is that welfare reform increased employment and income and reduced welfare dependency among single mothers. Based on my results, SSI youth who were removed as a result of this legislation did not, on average, replace the lost SSI income with earnings. Instead, removed SSI youth experienced a large reduction in observed income and a large increase in the volatility of that income.

Addressing the question of how much insurance SSI provides, I find that considering the level of benefits alone could substantially underestimate the value of the SSI benefit. SSI removal increases the volatility of income, which under risk aversion and limited intertemporal consumption smoothing implies that SSI has income stabilization value in addition to income supplementation value. Under various assumptions, up to one-quarter of the value of SSI to recipients comes from its income stabilization effects.

These results raise the question of *why* SSI youth do not recuperate the lost SSI income. One explanation is that their disabilities either lower their earnings potential or raise their disutility of work enough that it outweighs the benefits of the additional consumption afforded by working. The substantially lower earnings of removed SSI youth relative to other low-education populations suggests that disability—either directly through health, or indirectly through societal expectations and incentives—plays an important role in the low

earnings levels of removed SSI youth. Another explanation is that the effects of poverty, including low education levels, confine SSI youth to low-wage jobs and marginal labor force attachment. The fact that the earnings response varies with parental earnings and family structure, but not on any other observable dimension, suggests a potentially important role for the poverty channel. SSI youth who come from less-poor families have a much larger earnings response than those from households in abject poverty. One interpretation of the lack of heterogeneity with respect to health is that the human capital of the SSI youth population is so low that better health does not improve their labor market prospects. Understanding the relative roles of disability and poverty in the income drop is important for considering the usefulness of each as a tag for welfare programs.

The findings of this paper raise several questions for future research on welfare and disability programs. First, how would SSI youth fare if removal were anticipated? This paper estimates a local average treatment effect for SSI youth when removal from SSI is unanticipated. In a dynamic framework, SSI youth who anticipate being removed from the program may adjust their education and human capital decisions in response to this belief—for example, by deciding to complete high school or enrolling in vocational training. Second, to what extent do the changes in income levels and income volatility found in this paper translate into changes in consumption levels and consumption volatility? I use survey and descriptive evidence on the SSI population and the broader low-income population to help inform this question. Future work can improve on this analysis by using data on more sources of income—such as family transfers, non-disability public assistance, and unreported earnings—as well as consumption data. Third, an important challenge for future research on disability insurance is measuring the disutility of work. The earnings gains of removed SSI youth may come at a cost to their well-being if their disutility of work is high, either because their disabilities make work difficult or because the only work available to them is in the form of unpleasant, low-wage jobs. Other inputs into measuring the welfare implications of disability programs include effects on health and human capital as well as evidence on the activities and quality of life of current and former disability recipients, especially those who have little or no earned income.

## References

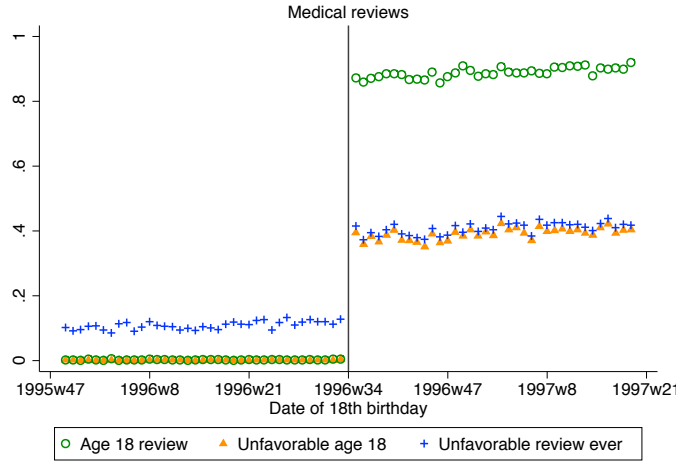
- Angrist, Joshua and Ivan Fernandez-Val**, “ExtrapoLATE-ing: External Validity and Overidentification in the LATE Framework,” 2010.
- **and Jorn-Steffen Pischke**, *Mostly Harmless Econometrics: An Empiricist’s Companion*, Princeton University Press, 2008.
- Autor, David H., Nicole Maestas, Kathleen Mullen, and Alexander Strand**, “Does Delay Cause Decay? The Effect of Administrative Decision Time on the Labor Force Participation and Earnings of Disability Applicants,” 2015.
- Baily, Martin Neil**, “Some Aspects of Optimal Unemployment Insurance,” *Journal of Public Economics*, 1978, 10, 379–402.
- Bitler, Marianne P., Jonah B. Gelbach, and Hilary W. Hoynes**, “Can Variation in Subgroups’ Average Treatment Effects Explain Treatment Effect Heterogeneity? Evidence from a Social Experiment,” 2014.
- Blank, Rebecca M.**, “Evaluating Welfare Reform in the United States,” *Journal of Economic Literature*, 2008, 40 (4), 1105–1166.
- Bound, John**, “The Health and Earnings of Rejected Disability Insurance Applicants,” *The American Economic Review*, June 1989, 79 (3), 482–503.
- Brown, Jeffrey R. and Amy Finkelstein**, “The Interaction of Public and Private Insurance: Medicaid and the Long-Term Care Insurance Market,” *American Economic Review*, 2008, 98 (3), 1083–1102.
- Chen, Susan and Wilbert van der Klaauw**, “The Work Disincentive Effects of the Disability Insurance Program in the 1990s,” *Journal of Econometrics*, February 2008, 142 (2), 757–784.
- Chetty, Raj**, “A general formula for the optimal level of social insurance,” *Journal of Public Economics*, November 2006, 90, 1879–1901.
- Coe, Norma B. and Matthew S. Rutledge**, “What is the Long-Term Impact of Zebley on Adult and Child Outcomes?,” 2013.

- Davies, Paul S., Kalman Rupp, and David Wittenburg**, “A Life-cycle perspective on the transition to adulthood among children receiving Supplemental Security Income payments,” *Journal of Vocational Rehabilitation*, 2009, 30, 133–151.
- Diamond, Peter and Eytan Sheshinski**, “Economic aspects of optimal disability benefits,” *Journal of Public Economics*, 1995, 57, 1–23.
- Dynan, Karen E., Jonathan Skinner, and Stephen P. Zeldes**, “Do the Rich Save More?,” *Journal of Political Economy*, 2004, 112 (2), 397–444.
- Edin, Kathryn and Laura Lein**, *Making Ends Meet: How Single Mothers Survive Low-Wage Work*, Russell Sage Foundation, 1997.
- FDIC**, “2013 FDIC National Survey of Unbanked and Underbanked Households,” Technical Report October 2014.
- Finkelstein, Amy, Nathaniel Hendren, and Erzo F.P. Luttmer**, “Welfare Analysis of Public Health Insurance Expansions,” 2014.
- Frandsen, Brigham R., Markus Frölich, and Blaise Melly**, “Quantile treatment effects in the regression discontinuity design,” *Journal of Econometrics*, June 2012, 168 (2), 382–395.
- French, Eric and Jae Song**, “The Effect of Disability Insurance Receipt on Labor Supply,” *American Economic Journal: Economic Policy*, 2014, 6 (2), 291–337.
- Gruber, Jonathan**, “The Consumption Smoothing Benefits of Unemployment Insurance,” *American Economic Review*, 1997, 87 (1), 192–205.
- Hemmeter, Jeffrey**, “Health-related unmet needs of supplemental security income youth after the age-18 redetermination.,” *Health Services Research*, August 2011, 46 (4), 1224–42.
- **and Elaine Gilby**, “The Age-18 Redetermination and Postredetermination Participation in SSI,” *Social Security Bulletin*, 2009, 69 (4).
- **, Jacqueline Kauff, and David Wittenburg**, “Changing circumstances: Experiences of child SSI recipients before and after their age-18 redetermination for adult benefits,” *Journal of Vocational Rehabilitation*, 2009, 30, 201–221.

- Hoynes, Hilary W. and Erzo F.P. Luttmer**, “The insurance value of state tax-and-transfer programs,” *Journal of Public Economics*, December 2011, *95* (11-12), 1466–1484.
- Kubik, Jeffrey D.**, “Incentives for the Identification and Treatment of Children with Disabilities: The Supplemental Security Income Program,” *Journal of Public Economics*, August 1999, *73* (2), 187–215.
- Lee, David S. and Thomas Lemieux**, “Regression Discontinuity Designs in Economics,” *Journal of Economic Literature*, 2010, *48* (June), 281–355.
- Maestas, Nicole, Kathleen Mullen, and Alexander Strand**, “Does Disability Insurance Receipt Discourage Work? Using Examiner Assignment to Estimate Causal Effects of SSDI Receipt,” *American Economic Review*, 2013, *103* (5), 1797–1829.
- Melly, Blaise**, “Rddqte,” 2014.
- Meyer, Bruce D. and James X. Sullivan**, “Measuring the Well-Being of the Poor Using Income and Consumption,” 2003.
- **and Wallace K.C. Mok**, “Disability, Earnings, Income, and Consumption,” 2013.
- Moore, Timothy J.**, “The employment effects of terminating disability benefits,” *Journal of Public Economics*, 2015, *124*, 30–43.
- Morduch, Jonathan and Rachel Schneider**, “The Hidden Financial Lives of Working Americans: Early Findings from the U.S. Financial Diaries Project,” Technical Report 2014.
- Venkatesh, Sudhir**, *Off the Books: The Underground Economy of the Urban Poor*, Vol. 3, Harvard University Press, 2009.
- von Wachter, Till, Jae Song, and Joyce Manchester**, “Trends in Employment and Earnings of Allowed and Rejected Applicants to the Social Security Disability Program,” *American Economic Review*, 2011, *101* (7), 3308–3329.

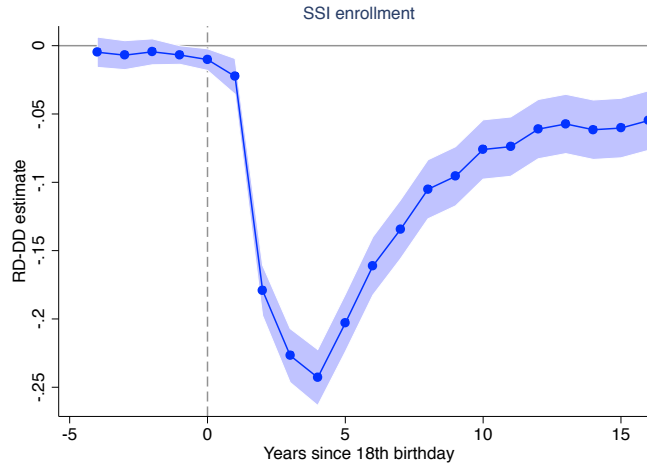
# Main Figures and Tables

Figure 1: Empirical Strategy Using Variation in Eligibility for Medical Reviews



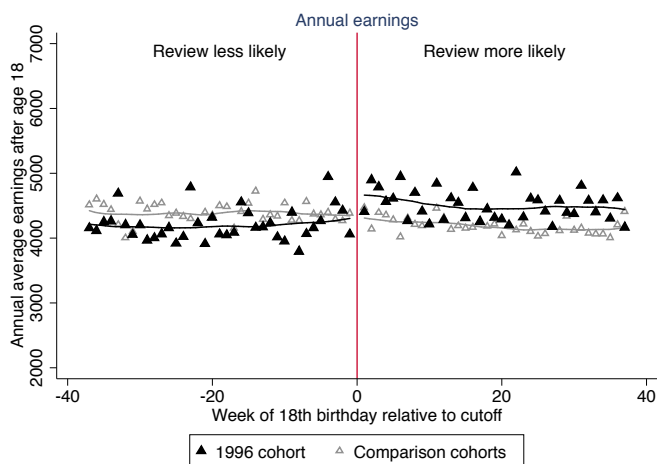
Notes: Figure plots the proportion of SSI children in each birthweek bin who receive an age 18 medical review, receive an unfavorable age 18 medical review, and ever receive an unfavorable medical review (through 2013). Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996.

Figure 2: Change in First Stage for SSI Enrollment Over Time



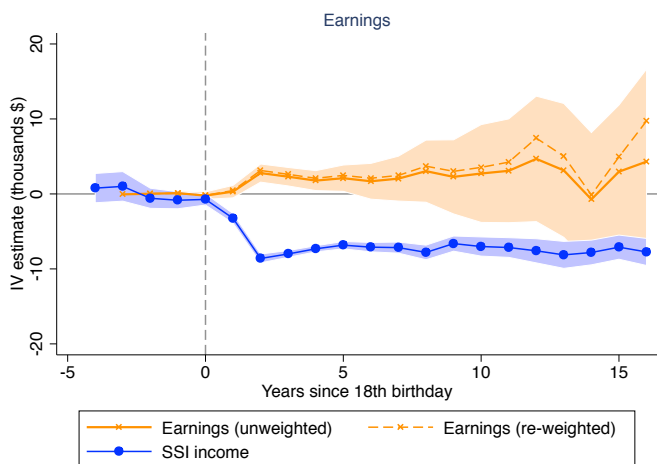
Notes: Figure plots the parametric RD-DD estimate of the effect of a child having an 18th birthday after the August 22 cutoff in the 1996 cohort versus the comparison cohorts (1994, 1995, and 1997), using a polynomial order of 2 with covariates. Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Figure 3: Reduced Form Effect on Annual Earnings



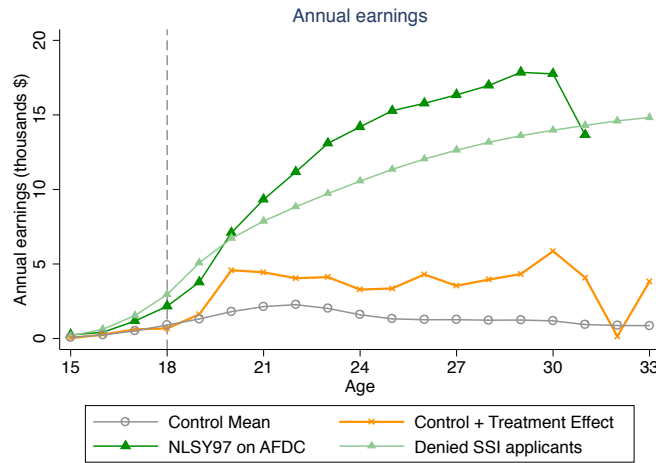
Notes: Figure plots average annual earnings after age 18. Solid markers indicate the 1996 cohort, while hollow gray markers represent the comparison cohorts (1994, 1995, and 1997). Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997.

Figure 4: IV Estimates of the Effect of SSI Removal on Earnings



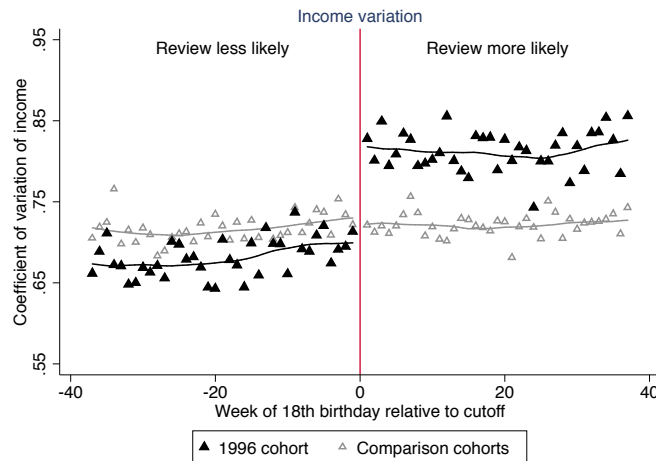
Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI on SSI income (circles) and earned income (X's) in each year, using a polynomial order of 2 with covariates. The solid earnings line represents unweighted IV estimates; the dashed line represents IV estimates re-weighted by the year 2 complier population (see Section 4.2 for details). Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Figure 5: Earnings of Removed SSI Youth vs. Broader Disadvantaged Population



Notes: Series marked with hollow circles is the average earnings for control group members who are still on SSI in that year. Series marked with X's plot control on SSI mean plus the treatment effect. Series marked with dark triangles graphs the earnings of the sample of youth from the National Longitudinal Survey of Youth-1997 whose families were enrolled in the Aid to Families with Dependent Children program during their childhood. Series marked with light triangles graphs the earnings of SSI child applicants who were born before 1990, denied from SSI at least once as children, and never spent time on SSI.

Figure 6: Reduced Form Effect on Income Volatility



Notes: Figure plots the average coefficient of variation of income over post-years 2 to 16. Solid markers indicate the 1996 cohort, while hollow gray markers represent the comparison cohorts (1994, 1995, and 1997). Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997.

Table 1: Sample and Complier Characteristics

	Full sample		Review compliers		Off SSI compliers			
	Mean (median)	Prop.	Prop.	Ratio	Year 2 Prop.	Year 2 Ratio	Year 16 Prop.	Year 16 Ratio
<b>Demographics</b>								
Male	0.63	63%	67%	1.07	68%	1.09	64%	1.03
Age at entry (> median)	11.4 (13)	44%	47%	1.06	36%	0.82	-112%	-2.52
Single mother	0.51	51%	57%	1.13	59%	1.16	78%	1.53
No parents	0.16	16%	11%	0.73	7%	0.47	-19%	-1.21
<b>Diagnosis</b>								
Mental	0.73	73%	78%	1.06	82%	1.12	110%	1.50
Intellectual	0.49	49%	45%	0.92	47%	0.96	80%	1.63
Other	0.25	25%	33%	1.34	35%	1.41	31%	1.24
Nervous	0.05	5%	2%	0.38	2%	0.30	5%	0.84
Infectious	0.04	4%	3%	0.87	0%	0.02	-21%	-5.43
Endocrine	0.04	4%	6%	1.63	6%	1.71	10%	2.79
Sensory	0.03	3%	1%	0.38	1%	0.42	3%	0.80
None	0.02	2%	1%	0.36	2%	0.78	-6%	-2.93
<b>Pre-treatment outcomes (&gt;median)</b>								
Child's SSI payment	\$3,075 (\$2,403)	50%	42%	0.83	40%	0.81	28%	0.56
Child earnings	\$289 (\$0)	49%	55%	1.13	49%	1.00	-64%	-1.32
Parent earnings	\$9,592 (\$4,121)	56%	54%	0.97	57%	1.03	37%	0.66
Par. and sib. disability applications	0.16 (0)	44%	51%	1.14	48%	1.07	60%	1.35
Par. and sib. disability income	\$2,728 (\$0)	50%	54%	1.07	49%	0.98	55%	1.11
N	81,800		31,870 (est.)		12,763 (est.)		3,632 (est.)	

Notes: The full sample is SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. Pre-treatment outcomes are annual averages taken over 1980 to 1996 for family outcomes and 1990 to 1996 for child outcomes. Compliers calculated using the methodology in Angrist and Pischke (2008). "Review compliers" are children who would receive an unfavorable age 18 medical review if in the treatment group but not if in the control group. "Off SSI Year 2 compliers" are children who would be off of SSI in year 2 if in the treatment group and on SSI in year 2 if in the control group, and analogously for "Off SSI Year 16 compliers." Since the proportions for compliers are estimated, they can be negative when the characteristic is very rare in the complier population.

Table 2: Covariate Balance Tests for RD-DD and Standard RD Specifications

	Standard RD				RD-DD			
	Linear		Quadratic		Linear		Quadratic	
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.
<b>Demographics</b>								
Male	0.0038	(0.0066)	0.0039	(0.0098)	0.0122	(0.0075)	0.0155	(0.0114)
Age at entry	-0.3140***	(0.0609)	-0.0480	(0.0898)	-0.220***	(0.0696)	-0.108	(0.106)
Single mother	0.0066	(0.0068)	-2.37e-05	(0.0101)	-0.00048	(0.0077)	-0.00082	(0.0118)
No parents	-0.0062	(0.0049)	0.0015	(0.0072)	-0.0023	(0.0056)	-0.0043	(0.0085)
Latest record date	-87.7***	(18.4)	0.9350	(27.2)	-40.1*	(21.0)	-8.51	(32.1)
<b>Diagnosis</b>								
Mental	0.0022	(0.0060)	0.0064	(0.0089)	-0.0056	(0.0070)	-0.0025	(0.0107)
None	-0.0035*	(0.0020)	-0.0015	(0.0029)	-0.0045	(0.0043)	-4.41e-05	(0.0065)
Nervous	0.0066**	(0.0031)	0.0069	(0.0045)	0.0085***	(0.0031)	0.0062	(0.0048)
Endocrine	0.0013	(0.0026)	0.00075	(0.0038)	-0.0015	(0.0029)	-0.0036	(0.0044)
Sensory	0.0064***	(0.0025)	-0.0023	(0.0036)	0.0011	(0.0025)	-0.0032	(0.0039)
Infection	-0.0135***	(0.0026)	-0.0118***	(0.0040)	0.0002	(0.0021)	0.00086	(0.0033)
Musculoskeletal	0.00066	(0.0015)	0.0024	(0.0022)	0.00064	(0.0016)	0.0024	(0.0025)
Respiratory	0.00074	(0.0014)	0.0003	(0.0022)	0.00062	(0.0016)	0.00060	(0.0025)
Neoplasm	0.00042	(0.0013)	0.00085	(0.0020)	-1.59e-05	(0.0015)	0.00049	(0.0023)
<b>Pre-treatment...</b>								
Child SSI payment	152.1***	(28.8)	11.4	(42.5)	95.2***	(32.9)	27.4	(50.2)
Child earnings	-34.7***	(9.9)	-0.709	(13.2)	-6.99	(11.2)	-5.19	(15.5)
Family dis. apps	-0.0055	(0.0042)	-0.0088	(0.0062)	-0.0075	(0.0048)	-0.0114	(0.0074)
Family dis. receipt	39.7	(73.2)	-45.9	(107.6)	-2.35	(82.8)	6.68	(126.5)
Parent earnings	-574.3***	(182.0)	-421.5	(268.8)	-280.3	(205.3)	-338.2	(314.1)
N	81,799		81,799		300,888		300,888	
Joint F test	109.07		31.79		40.32		22.49	
p-value	0.0000		0.2833		0.0619		0.7582	

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Table presents covariate balance tests for the linear and quadratic standard RD specification (equation 1) and the linear and quadratic RD-DD specification (equation 2). Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (for standard RD), plus SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1994, 1995, and 1997 (for RD-DD). Standard errors clustered at individual level shown in parentheses.

Table 3: First Stage, Reduced Form, and IV Estimates

	FS/RF		IV: Age 18 removal		IV: Off SSI		Control mean	IV % change	N
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.			
First stage									
Received age 18 review	0.864***	(0.0056)					0.002		300,887
Unfavorable age 18	0.386***	(0.0077)					0.001		300,887
Annual SSI enrollment	-0.110***	(0.0085)					0.589		300,887
Income measures (annual)									
SSI income	-848***	(70.07)	-2,194***	(172)	-7,704***	(305)	\$4,055	-190%	300,887
Earnings	290	(179)	751	(460)	2,638*	(1,551)	\$4,222	62%	300,887
Earnings > \$0	0.0264***	(0.0080)	0.0684***	(0.0203)	0.240***	(0.0664)	0.406	59%	300,887
Earnings > \$15K	0.0124**	(0.0050)	0.0322**	(0.0129)	0.113***	(0.0429)	0.103	110%	300,887
DI income	-80.8*	(42.4)	-209*	(109)	-734*	(388)	\$688	-107%	300,887
Cumul. DI applications	-0.0801***	(0.0203)	-0.207***	(0.0531)	-0.728***	(0.201)	0.375	-194%	300,887
Total observed income	-666***	(172)	-1,723***	(447)	-6,052***	(1,657)	\$9,041	-67%	300,887
Volatility measures									
CV of income	0.128***	(0.0177)	0.332***	(0.0450)	1.164***	(0.137)	0.682	171%	300,887
CV of detrended income	0.153***	(0.0146)	0.396***	(0.0368)	1.392***	(0.131)	0.458	304%	300,887
SD of income	58.5	(103)	151.4	(267)	532	(923)	\$4,155	13%	300,887
SD of log income	0.198***	(0.0386)	0.513***	(0.0983)	1.801***	(0.305)	1.626	111%	300,887
Annual % income change	0.168***	(0.0253)	0.435***	(0.0639)	1.528***	(0.216)	0.652	234%	300,887
CV of earnings	-0.0646**	(0.0277)	-0.167**	(0.0716)	-0.587**	(0.248)	1.363	-43%	300,887
Household income (annual)									
Parent earnings	401	(303)	1,022	(774)	3,557	(2,700)	\$11,974	30%	265,592
Parent and sib. dis apps	-0.0078**	(0.0036)	-0.0199**	(0.0091)	-0.0691**	(0.0321)	0.089	-78%	265,077
Parent and sib. dis income	-1.33	(159)	-3.37	(405)	-11.68	(1,401)	\$4,812	0%	265,078
Sib. earnings in adulthood	-612**	(295)	N/A	N/A	N/A	N/A	\$3,817		79,497

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD first stage, reduced form, and IV estimates using a polynomial order of 2 based on covariate balance results. Percent decrease from control group mean may exceed 100% because some control group members leave SSI after the age of 18; see Appendix Table A.16 for comparison with control group members who stay on SSI. IV estimates not given for sibling earnings in adulthood because instrument may affect siblings through a channel other than age 18 removal (see discussion in the Appendix). Results across different specifications presented in Appendix Tables A.6-A.15. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table 4: Earnings IV Estimates by Subgroup Using Off SSI

## Panel A: Demographics

	Parent earnings		Family structure			Gender		
Quintile 1	-\$886	(\$1,424)	Two parents	\$3,418***	(\$1,150)	Female	\$2,334***	(\$716)
Quintile 2	\$285	(\$1,107)	Single or none	\$1,848**	(\$723)	Male	\$2,280**	(\$906)
Quintile 3	\$3,035**	(\$1,188)						
Quintile 4	\$5,794***	(\$1,786)						
Quintile 5	\$3,631**	(\$1,588)						

## Panel B: Diagnosis and severity

	Diagnosis		Removal probability			Years on SSI		
Non-mental	\$1,702	(\$1,411)	Quintile 1	\$1,489	(\$3,482)	1-3 years	\$1,514	(\$1,182)
Other mental	\$2,215*	(\$1,158)	Quintile 2	-\$964	(\$3,481)	4-5 years	\$3,044***	(\$913)
Intellectual	\$2,869***	(\$789)	Quintile 3	\$2,538**	(\$1,222)	6-9 years	\$1,836	(\$1,375)
			Quintile 4	\$3,308***	(\$936)	10-13 years	\$3,405	(\$2,817)
			Quintile 5	\$2,656***	(\$933)	14-18 years	-\$610	(\$4,488)

## Panel C: Local economic conditions

	County unemployment rate		County poverty rate		
Quintile 1	\$2,588*	(\$1,534)	Quintile 1	\$985	(1,845)
Quintile 2	\$3,134*	(\$1,603)	Quintile 2	\$3,143***	(\$1,210)
Quintile 3	\$201	(\$1,290)	Quintile 3	\$806	(\$1,449)
Quintile 4	\$2,860**	(\$1,272)	Quintile 4	\$3,120**	(\$1,395)
Quintile 5	\$3,226***	(\$1,246)	Quintile 5	\$3,090***	(\$1,123)

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD IV estimates by subgroup for earnings using a polynomial order of 2, using off SSI as the endogenous variable. "Removal probability" calculated by regressing removal on demographic and diagnosis covariates for the treatment group and then predicting removal for both the treatment and control groups. County unemployment rate is the 1997 unemployment rate. County poverty rate is the 1999 poverty rate. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table 5: Constant Equivalent Loss from SSI Removal

Floor	Constant equivalent loss				% loss from volatility			
	Relative risk aversion ( $\gamma$ )				Relative risk aversion ( $\gamma$ )			
	0	1	2	3	0	1	2	3
Recipient income only ( $c_{1t}$ )								
\$1,000	\$5,940	\$6,942	\$7,758	\$7,891	0%	14%	23%	25%
\$2,000	\$5,437	\$6,109	\$6,701	\$6,837	0%	11%	19%	20%
\$3,000	\$4,879	\$5,316	\$5,748	\$5,859	0%	8%	15%	17%
\$4,000	\$4,262	\$4,514	\$4,826	\$4,912	0%	6%	12%	13%
\$5,000	\$3,603	\$3,702	\$3,917	\$3,983	0%	3%	8%	10%
Recipient income plus 1/3 parental income ( $c_{2t}$ )								
\$1,000	\$5,273	\$5,674	\$6,294	\$6,473	0%	7%	16%	19%
\$2,000	\$5,154	\$5,453	\$5,945	\$6,121	0%	5%	13%	16%
\$3,000	\$4,982	\$5,179	\$5,545	\$5,689	0%	4%	10%	12%
\$4,000	\$4,710	\$4,806	\$5,072	\$5,184	0%	2%	7%	9%
\$5,000	\$4,374	\$4,370	\$4,534	\$4,598	0%	0%	4%	5%
Recipient income plus variable parental income ( $c_{3t}$ )								
\$1,000	\$2,394	\$2,854	\$3,703	\$4,122	0%	16%	35%	42%
\$2,000	\$2,285	\$2,641	\$3,377	\$3,807	0%	13%	32%	40%
\$3,000	\$2,146	\$2,405	\$3,002	\$3,388	0%	11%	29%	37%
\$4,000	\$1,963	\$2,127	\$2,611	\$2,943	0%	8%	25%	33%
\$5,000	\$1,701	\$1,761	\$2,129	\$2,399	0%	3%	20%	29%

Notes: Table presents estimates of the constant equivalent loss from SSI removal, where constant equivalent is defined in equation (5). The constant equivalent loss is the estimate of  $\beta$  in the RD-DD IV equation (3), where the dependent variable is the individual's constant equivalent over the entire 16-year post-period and the endogenous regressor is average annual SSI enrollment over the same post-period. First panel gives the constant equivalent loss where consumption is measured as the maximum of a consumption floor and total observed recipient income. Second panel gives the constant equivalent loss where consumption is measured as the maximum of a consumption floor and total observed recipient income plus one-third of parental income. Third panel gives the constant equivalent loss where consumption is measured as the maximum of a consumption floor and total observed recipient income plus a variable fraction of parental income. See Section 6 for details.

## Appendix (For Online Publication)

### Characterizing the complier population

The RD design identifies the effect of having an 18th birthday after the August 22nd cutoff for the complier population: the children who would receive an unfavorable age 18 review if they had a birthday after the cutoff, but would not receive an unfavorable age 18 review if they had a birthday before the cutoff. Examining the characteristics of the complier population is important for the external validity of the results. The “Review complier” column in Table 1 presents the complier characteristics analysis based on the procedure outlined in Angrist and Pischke (2008), where compliers are defined using unfavorable age 18 review as the treatment variable.<sup>26</sup> The table gives the proportion of the full sample and the review complier population with a given characteristic (for continuous characteristics, the proportion above the median). The review compliers are representative of the full sample on most characteristics affecting substantial proportions of the population. Mental conditions other than intellectual disability are overrepresented in the review complier population, which is expected since many mental conditions that qualify children for SSI—for example, ADHD and other learning disabilities—are less likely to qualify adults for SSI. Intellectual disability is slightly underrepresented in the review complier population.<sup>27</sup> The review complier population is representative of the full sample on pre-treatment outcomes, including parental and child earnings and family disability receipt, as well as demographic variables.

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<sup>26</sup>The average of characteristic  $X$  over the complier population is the term  $E(X|D_1 = 1, D_0 = 0)$  in the expression

$$E(X|D_1 = 1) = E(X|D_1 = 1, D_0 = 1)P(D_0 = 1|D_1 = 1) + E(X|D_1 = 1, D_0 = 0)P(D_0 = 0|D_1 = 1)$$

where  $D_z = d$  indicates whether the individual was treated ( $z = 1$ ) or not ( $z = 0$ ), and whether the individual was moved by the instrument ( $d = 1$ ) or not ( $d = 0$ ). Intuitively, the average of a characteristic over treatment group members who receive an unfavorable age 18 review is the weighted average over always takers (those who receive an unfavorable age 18 review whether they are treated or not) and compliers (those who receive an unfavorable age 18 review if and only if they are treated), where the weights are the proportion of always takers and compliers in the population, respectively. The average over treatment group members who receive an unfavorable age 18 review is empirically known. The average over always takers is estimated from control group members who receive an unfavorable age 18 review. The proportion of compliers can be estimated by subtracting off the proportion of always takers (control members who receive an unfavorable age 18 review) and never takers (treatment group members who do not receive an unfavorable age 18 review). I estimate that 39% of the sample is in the complier population when defined in terms of an unfavorable age 18 medical review, and 22% of the sample is in the complier population when defined in terms of being on SSI four years after age 18. These proportions are similar to the 23% complier population estimated by Maestas et al. (2013) for adult SSDI recipients defined in terms of the disability examiner instrument.

<sup>27</sup>These results by diagnosis are consistent with findings by Hemmeter and Gilby (2009) that children with intellectual disabilities have relatively low age-18 cessation rates while those with other mental conditions have high cessation rates.

I measure changes in the composition of the complier population over time in the final columns of Table 1. The “Off SSI Year 2 compliers” are the group of children who were off the program in year two if assigned to the treatment group and on the program in year two if assigned to the control group, and analogously for “Off SSI Year 16 compliers.” Between year 2 and year 16, the complier population becomes poorer and less healthy. Later year compliers enter the program at a younger age, are more likely to have a diagnosis of intellectual disability, and are more likely to come from poor and single-mother-headed households. Recall from Section 3 that most of the attenuation in the first stage comes from control group members falling out of compliance by leaving the program, either because their health improves or because they violate income and asset rules.

### **Estimating earnings and income responses by family members**

SSI removal may also affect the earnings and income of parents, siblings, and other family members of the removed SSI youth, especially if the youth is still financially connected to the household after the age of 18. The survey data reviewed in Section 6 indicates that around half of SSI children continue to live with parents in their early 20s. However, I find no statistically significant discontinuity in parental earnings at the birthdate cutoff (see Table 3), nor any evidence of an increase in the discontinuity in the years following SSI removal (Appendix Figure A.15). Nor do parents change their disability applications or income in response.

SSA data also allow me to observe the adult earnings of siblings of removed SSI youth who are themselves enrolled in SSI at some time, though not of all siblings more generally. I limit the sample to younger siblings of the 18-year-olds, since they are most likely to be living at home when the 18-year-old is removed. The number of younger siblings on SSI is a surprisingly large 22,070 from the original sample of 81,800 18-year-olds, reflecting high within-family correlation in SSI enrollment.<sup>28</sup> The birthdate discontinuity may affect the adult earnings of younger siblings through multiple channels. First, if the 18-year-old is still financially connected to household, then the loss of the 18-year-old’s SSI payment may affect siblings through a decrease in household income. With median parental earnings around \$8,000 in the year of the 18-year-old’s 18th birthday, the loss of \$8,000 in SSI benefits could

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<sup>28</sup>Eighty percent of 18-year-olds in the sample have no younger siblings on SSI, 15% have one younger sibling on SSI and 5% have more than one younger sibling on SSI. I cluster standard errors at the household level to adjust for multiple younger siblings on the program.

represent a reduction in household income of up to 50% for the median household. Second, the 18-year-old's review may affect the likelihood that younger siblings are enrolled in SSI in adulthood. Third, for younger siblings who are themselves on SSI, witnessing the age 18 medical review process may cause them to update their expectations about the likelihood of their own removal from SSI and change their behavior accordingly. If either of the latter channels hold, then SSI removal of the 18-year-old is not the appropriate endogenous variable for younger sibling earnings in adulthood. For this reason, I report reduced form estimates only rather than IV estimates.

I find that younger siblings of 18-year-olds with an 18th birthday after the cutoff have average annual earnings \$600 lower than younger siblings of 18-year-olds with an 18th birthday before the cutoff; they are 3.0 percentage points less likely to earn more than \$5,000 per year and 2.5 percentage points less likely to earn more than \$10,000. These estimates are significant at the 5% level. These results suggest that the 18-year-old's review has substantial adverse impacts on younger siblings who are also on SSI. I find no effects of SSI removal on the likelihood that younger siblings are enrolled in SSI in adulthood, meaning that the effects on younger sibling earnings are not working through the younger sibling's own SSI status. The most plausible explanations for these effects are adverse effects from the household income loss or changes in beliefs about the likelihood of their own removal. Future research should examine whether these large point estimates generalize to all younger siblings or are specific to younger siblings who are on SSI.

## **Estimating effects on Medicaid enrollment**

I do back-of-the-envelope calculations to estimate the Medicaid loss from SSI removal since I do not observe Medicaid enrollment in my data. Using self reports of Medicaid enrollment from the National Survey of SSI Children and Families, [Hemmeter \(2011\)](#) finds that Medicaid enrollment among SSI youth who remain on SSI after an age 18 medical review is 96%, versus 25% for those who are removed. Multiplying the SSI enrollment first stage in each year by 71 (=96-25) percentage points gives an approximate Medicaid enrollment first stage. I multiply this Medicaid enrollment first stage by the value of Medicaid to get the value of the Medicaid loss. Estimates for the value of Medicaid vary widely, and few focus on the specific population of disability recipients. [Finkelstein et al. \(2014\)](#) use estimates from the Oregon health insurance experiment to estimate an annual value of Medicaid of

\$2,600 for the broader low-income population. The value of Medicaid may be larger for the disabled population if they have higher out-of-pocket expenditures without insurance, or if the covariance between the marginal utility of consumption and the Medicaid transfer is higher for them. Using \$2,600 as the value of Medicaid yields a total value of the SSI loss including Medicaid of at least \$117,000 in present discounted value, or 30% greater than the value of the cash benefit loss alone.<sup>29</sup>

## Considering effects on social welfare

Diamond and Sheshinski (1995) model the social planner's problem when the disutility of work is observable and unobservable. When the disutility of work  $\theta$  is continuous (with distribution  $F(\theta)$ ) and observable, the social planner sets consumption for workers ( $c_a$ ), consumption for those on disability insurance ( $c_d$ ), and the disutility cutoff  $\theta^*$  above which people are allowed onto disability insurance. Those with disutility below  $\theta^*$  become workers, and those with disutility above  $\theta^*$  become non-workers. Workers produce 1 and non-workers produce 0. The social planner maximizes the utility of workers and non-workers subject to a resource constraint  $R$ :

$$\max_{c_a, c_d, \theta^*} \int_0^{\theta^*} [u(c_a) - \theta] dF(\theta) + \int_{\theta^*}^{\infty} v(c_d) dF(\theta) \quad (6)$$

$$\text{s.t.} \quad \int_0^{\theta^*} (c_a - 1) dF + \int_{\theta^*}^{\infty} (c_d) dF = R \quad (7)$$

where  $u(c_a)$  is the utility from consumption for workers and  $v(c_d)$  is the utility from consumption for non-workers. Solving this maximization problem yields two key conditions that characterize the optimum:

$$u'(c_a^*) = v'(c_d^*) \quad (8)$$

$$u(c_a^*) - \theta^* - v(c_d^*) = u'(c_a^*)(c_a^* - 1 - c_d^*) \quad (9)$$

Condition (8) says that consumption levels are set to equalize the marginal utility of consumption for workers and non-workers. When the disutility of work is perfectly observable,

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<sup>29</sup>The 1997 March Supplement to the Current Population Survey values Medicaid at \$6,000 for individuals aged 20-34 who are on SSI. Using this figure, the total value of the SSI loss including Medicaid would be \$182,000 in present discounted value, or more than 100% greater than the value of the cash benefit loss alone.

there is perfect consumption smoothing across the able and disabled states. In condition (9), the left-hand-side is the utility loss from work for someone with disutility of work  $\theta^*$ , and the right hand side is the marginal utility of consumption from work. The social planner awards disability insurance to people for whom the social cost of work (in the form of private disutility) outweighs the social benefit of work (in the form of additional consumption).

When the disutility of work is imperfectly observed, the cutoff  $\theta^*$  is no longer set by the social planner but is endogenously determined by agents who maximize their utility taking  $c_a$  and  $c_d$  as given. A higher level of  $c_d$ , in addition to smoothing consumption as before, now induces people with a marginal disutility of work to apply for disability insurance and stop working if allowed (i.e.,  $\theta^*$  falls). This tightens the government's resource constraint by lowering the output from work and increasing the expenditures of the disability program. The phenomenon of an endogenous  $\theta^*$  is commonly referred to as moral hazard. When the disutility of work is imperfectly observed, the social planner does not perfectly smooth consumption across the able and disabled states because of the moral hazard costs of doing so.

In the [Diamond and Sheshinski \(1995\)](#) model, the social planner weighs consumption smoothing and other benefits with moral hazard costs when the disutility of work is imperfectly observed. I consider the empirical inputs needed to estimate both sides of the social planner's problem. I start with the benefits side of the social planner's problem. This paper contributes to the empirical estimation of the consumption smoothing benefits of SSI by estimating (under the assumptions discussed in Section 6) the increase in consumption levels and the decrease in consumption volatility resulting from SSI receipt. However, there are at least two additional parameters needed to estimate consumption smoothing benefits. First, it is necessary to know the magnitude of the consumption drop associated with having a disability, relative to consumption in the able-bodied state. Assuming that utility is not state-dependent, a larger consumption drop from disability means greater consumption smoothing benefits from disability insurance and thus a higher optimal level of disability insurance. My data do not allow me to estimate the consumption drop associated with disability because I do not observe individuals in the able-bodied state.<sup>30</sup> The second input needed to estimate consumption smoothing benefits is knowledge of the form of the utility function in the able-bodied state and the disabled state. Disability might increase

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<sup>30</sup>Using the Panel Study of Income Dynamics, [Meyer and Mok \(2013\)](#) estimate that chronic and severe disability in adults is associated with a 24% decline in food and housing consumption ten years after onset.

the marginal utility of consumption through, for example, higher medical bills that leave the disabled individual starving. On the other hand, disability might decrease the marginal utility of consumption by making it difficult to enjoy types of consumption enjoyed by the able-bodied individual. For a population with near-poverty consumption levels, it may be reasonable to assume that the marginal utility of consumption remains high whether or not the individual is disabled, but there is little empirical evidence on this issue. As a heavily means-tested program, SSI may have redistributive benefits in addition to consumption smoothing benefits, depending on the form of the social welfare function and the weights placed on different individuals. Thus another input into estimating the benefits side of the social planner's problem is the desired amount of redistribution in the social welfare function.

The other side of the social planner's problem reflects the moral hazard costs of disability insurance. These costs could take several forms in the context of SSI. The most obvious is the marginal tax rates on earnings imposed by the program: SSI benefit levels are reduced by \$1 for every \$2 in earnings after a small monthly allowance, which distorts the labor-leisure tradeoff facing the recipient. The \$2,600 increase in earnings that I estimate includes both the effect of SSI's marginal tax rates, which is distortionary, and the effect of the SSI income loss, which is non-distortionary and therefore does not affect social welfare. However, given that earnings response estimate is small, it provides a meaningful upper bound on the substitution effect created by the program's marginal tax rates. Perhaps more importantly, critics of the SSI program have argued that SSI may have other moral hazard effects, especially for children, such as harming health through the effort to demonstrate medical eligibility.<sup>31</sup> My data do not allow me to measure the effects of other types of moral hazard that do not show up in the earnings of SSI youth.

## Calculating optimal benefit levels

Clearly, calculating the optimal SSI benefit requires many inputs that I cannot estimate using my data and quasi-experiment. As an illustrative exercise, I do back-of-the-envelope calculations of the optimal SSI benefit using my IV estimates for earnings and income in

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<sup>31</sup>See, e.g., Patricia Wen, "The Other Welfare," *Boston Globe*, December 12, 2010; U.S. Congress, House Subcommittee on Human Resources of the Committee on Ways and Means, Hearing on Supplemental Security Income Benefits for Children, October 27, 2011; and Nicholas Kristof, "Profiting from a Child's Illiteracy," *New York Times*, December 7, 2012.

combination with other data sources and estimates and various assumptions. I use my IV estimates for earnings and income to calculate optimal benefit levels under various assumptions by adapting the formula for optimal social insurance derived by [Baily \(1978\)](#), applied by [Gruber \(1997\)](#), and generalized by [Chetty \(2006\)](#):

$$\epsilon_{e,b} = \gamma \frac{c_{able} - c_{dis}}{c_{able}}(b^*) \quad (10)$$

where  $\epsilon_{e,b}$  is the elasticity of earnings to the SSI benefit;  $\gamma = \frac{cu''(c)}{u'(c)}$  is the coefficient of relative risk aversion;  $c_{able}$  is consumption in the able-bodied state; and  $c_{dis}$  is consumption in the disabled state, including the SSI benefit. The term  $\frac{c_{able}-c_{dis}}{c_{able}}$  is a function of the benefit level  $b$ . Roughly, this formula says that at the optimal benefit level  $b^*$  the cost to the government of providing SSI benefits—in the form of lost tax revenue from the earnings decline—equals the change in consumption between the able and disabled states, appropriately valued based on the level of risk aversion. Moral hazard enters the formula through the government’s budget constraint. Since the program is funded out of tax revenue, the elasticity of (taxable) earnings with respect to benefit levels, on the left-hand-side of equation (10), represents the cost to the government of funding the disability insurance program. The right-hand-side of the equation represents the benefits of the program in closing the gap in consumption between the able-bodied and disabled states of the world.

The derivation of this formula involves a number of assumptions relevant to this context. First, this version of the optimal benefits formula assumes that third-order terms in the utility function are negligible (i.e.,  $u''' = 0$ ), which amounts to an assumption of no precautionary savings motive. Second, the derivation of this formula assumes that utility is not state-dependent, meaning that the marginal utility of consumption does not change across the able-bodied and disabled states. For a population with near-poverty consumption levels, it may be reasonable to assume that the marginal utility of consumption remains high whether or not the individual is disabled, but there is little to no empirical evidence on whether this assumption holds. Third, this formula holds for marginal changes in benefit levels, so it should be applied with caution to the non-marginal change of SSI removal. Finally, I apply equation (10) to find the globally optimal benefit level, which requires concavity of the Social Planner’s problem.

I calculate  $\epsilon_{e,b}$  from the IV estimates in [Table 3](#). Since the change in the benefit level

is large, the point elasticity is highly sensitive to the choice of starting point. To avoid this problem, I calculate the arc elasticity for earnings, which uses the midpoint as the baseline:

$$\hat{\epsilon}_{e,b} = \frac{\frac{e_{no} - e_{SSI}}{(e_{no} + e_{SSI})/2}}{\frac{b_{no} - b_{SSI}}{(b_{no} + b_{SSI})/2}}$$

where  $e_{no}$  is earnings when not on SSI,  $e_{SSI}$  is earnings when on SSI, and analogously for the SSI benefit amounts  $b_{no}$  and  $b_{SSI}$ . I calculate an earnings elasticity of 0.255. The elasticity estimate is similar if I follow [Meyer and Mok \(2013\)](#) and use participation elasticities instead: 0.234 for the \$0 threshold, and 0.325 for the \$5,000 threshold.

Unlike [Gruber \(1997\)](#), who applies equation (10) to optimal unemployment insurance, I cannot calculate  $\frac{c_{able} - c_{dis}}{c_{able}}(b^*)$  as a single estimate. In Gruber’s case, the change in benefit levels corresponds to a change in unemployment status; therefore he is able to estimate the effect of the benefit level on the drop in consumption between the employed and unemployed states. In my case, SSI removal does not correspond to a change in disability status; I estimate the effect of the benefit decrease on consumption for those in the disabled state only. Therefore I must estimate  $c_{able}(b)$  and  $c_{dis}(b)$  separately.

I estimate consumption in the able-bodied state ( $c_{able}$ ) from personal income in the March Supplement to the 1997 Current Population Survey (CPS), based on disability status, education level, and age. For simplicity, I assume that  $c_{able}$  does not vary with the benefit level; this may not be true if the availability of disability benefits affects savings rates, but it is probably a reasonable approximation for a low-income population.

I estimate  $c_{dis}$  from a combination of my data and the CPS. Since my quasi-experiment provides an exogenous change in benefit levels, I use my data to estimate how  $c_{dis}$  varies with the benefit level. From [Table 3](#), reducing the benefit amount from \$7,700 to \$0 decreases total income from \$9,000 to \$3,800, which, assuming a linear slope, means that a \$1 increase in benefits increases consumption by \$0.675. To improve consistency between  $c_{able}$  and  $c_{dis}$  in what type of income is observed, I estimate the “intercept” (i.e., consumption in the disabled state when the benefit level is zero) from the same CPS source and get approximately \$7,300. Therefore the relationship between consumption in the disabled state and the benefit level is

$$c_{dis} = 0.675b + 7300.$$

I solve for the globally optimal benefit level by plugging the estimates of  $\epsilon_{e,b}$ ,  $c_{dis}$ , and

$c_{able}$  into equation (10).<sup>32</sup> Table A.18 presents the calculation of the globally optimal SSI benefit for different values of relative risk aversion and different education levels of the able-bodied comparison. Choosing the appropriate able-bodied comparison income involves important considerations. According to my tabulations from the National Survey on SSI Children and Families, just over half of former SSI child applicants and recipients have a high school diploma or GED certificate, while just under half are high school dropouts. The most obvious able-bodied comparison income for this group is therefore an average between high school graduate and high school dropout income. But if disability *restricts* educational achievement, then the more appropriate comparison may be a high school graduate income, since SSI youth would have achieved this level of income in the able-bodied state of the world. A deeper consideration still is whether SSI is solely insurance against disability, or if it is also insurance against poverty behind the veil of ignorance. If the latter, then the argument for using a higher able-bodied comparison income is stronger. The results are given in the first two rows of Table A.18.

Given the finding that SSI substantially decreases income volatility, I do a mechanical calculation to adjust for the income volatility effects of the SSI benefit. The goal is to find the zero- or low-volatility SSI benefit level that gives the same utility as the earnings-equivalent optimal benefit calculated in the first set of columns. I use a quadratic utility function for this calculation because it makes the mean-variance tradeoff explicit and therefore makes calculations straightforward:

$$\begin{aligned} U(c) &= c - \frac{k}{2}c^2, \quad k < \frac{1}{c} \\ E[U(c)] &= E(c) - \frac{k}{2}E(c^2) \\ E[U(c)] &= E(c) - \frac{k}{2}[Var(c) + (E(c))^2] \end{aligned}$$

The expected utility of the SSI benefit is

$$E[U(b)] = \mu_b - \frac{k_b}{2}[\sigma_b^2 + \mu_b^2]$$

where  $\mu_b$  is the mean SSI benefit level,  $\sigma_b^2$  is the variance of SSI income, and  $k_b = \frac{\gamma}{(1+\gamma)\mu_b}$ .

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<sup>32</sup>To estimate local optimality, I compare the magnitude of each side of equation (10) at the current benefit level. I find that the SSI benefit is locally too small for  $\gamma \geq 1$  and locally too large for  $\gamma < 1$ .

The expected utility of earnings equivalent benefit level  $e$  is

$$E[U(e)] = \mu_e - \frac{k_e}{2}[\sigma_e^2 + \mu_e^2]$$

where  $\mu_e$  is the earnings-equivalent optimal benefit from above,  $\sigma_e^2$  is the variance of earnings, and  $k_e = \frac{\gamma}{(1+\gamma)\mu_e}$ .

I compute the  $\mu_b$  that makes the utility from the reliable SSI benefit equal to the utility from volatile earnings:

$$\begin{aligned} \mu_b - \frac{k_b}{2}[\sigma_b^2 + \mu_b^2] &= \mu_e - \frac{k_e}{2}[\sigma_e^2 + \mu_e^2] \\ \implies \mu_b &= \frac{[1 - \frac{\gamma}{2(1+\gamma)}(V_e^2 + 1)]}{[1 - \frac{\gamma}{2(1+\gamma)}(V_b^2 + 1)]}\mu_e \end{aligned} \quad (11)$$

where  $V_e$  is the coefficient of variation for earnings ( $= \frac{\sigma_e}{\mu_e}$ ) for those removed. I calculate the volatility-adjusted optimal benefit level  $\mu_b$  by plugging in the earnings-equivalent optimal benefit calculated above for  $\mu_e$ .

I first consider the case in which SSI income has no volatility. Equation (11) reduces to

$$b = \frac{[1 - \frac{\gamma}{2(1+\gamma)}(V_e^2 + 1)]}{1 - \frac{\gamma}{2(1+\gamma)}}\mu_e$$

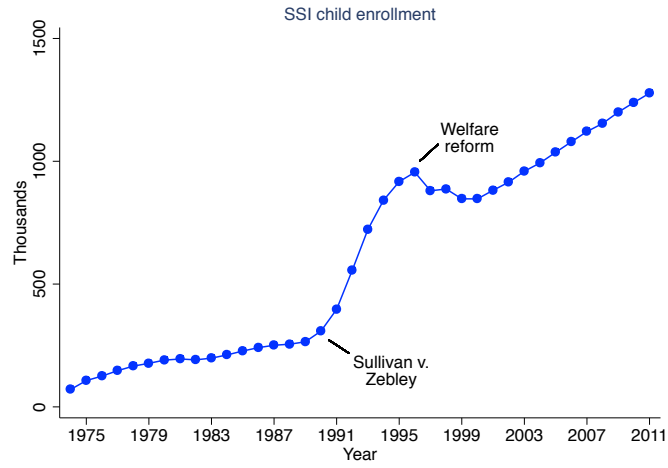
since  $\mu_b = b$  and  $V_b = 0$ . The results are given in the second set of rows in Table A.18. I find that the optimal benefit level shrinks by 30% when consumption volatility is considered. In addition, the optimal benefit is no longer strictly increasing in risk aversion when consumption volatility is considered. This phenomenon reflects the opposing forces of risk aversion: higher risk aversion increases the optimal benefit level since there is greater value in mitigating the drop in income between the able-bodied and disabled states, but it reduces the optimal benefit level by making the SSI benefit more valuable relative to earnings.

I next consider the case in which SSI income has some volatility ( $V_b > 0$ ) because there is a risk of removal from the program in adulthood. Table A.18 gives results for a medium chance of removal (1% annually) and a high chance of removal (3% annually). I use equation (11) to calculate the volatility-adjusted benefit in these cases. Introducing the possibility of removal from SSI in adulthood increases the optimal benefit level since SSI has lower consumption volatility benefits. As shown in the final rows of Table A.18, introducing the

possibility of removal from SSI in adulthood works to increase the optimal benefit level since SSI has lower consumption stabilization benefits.

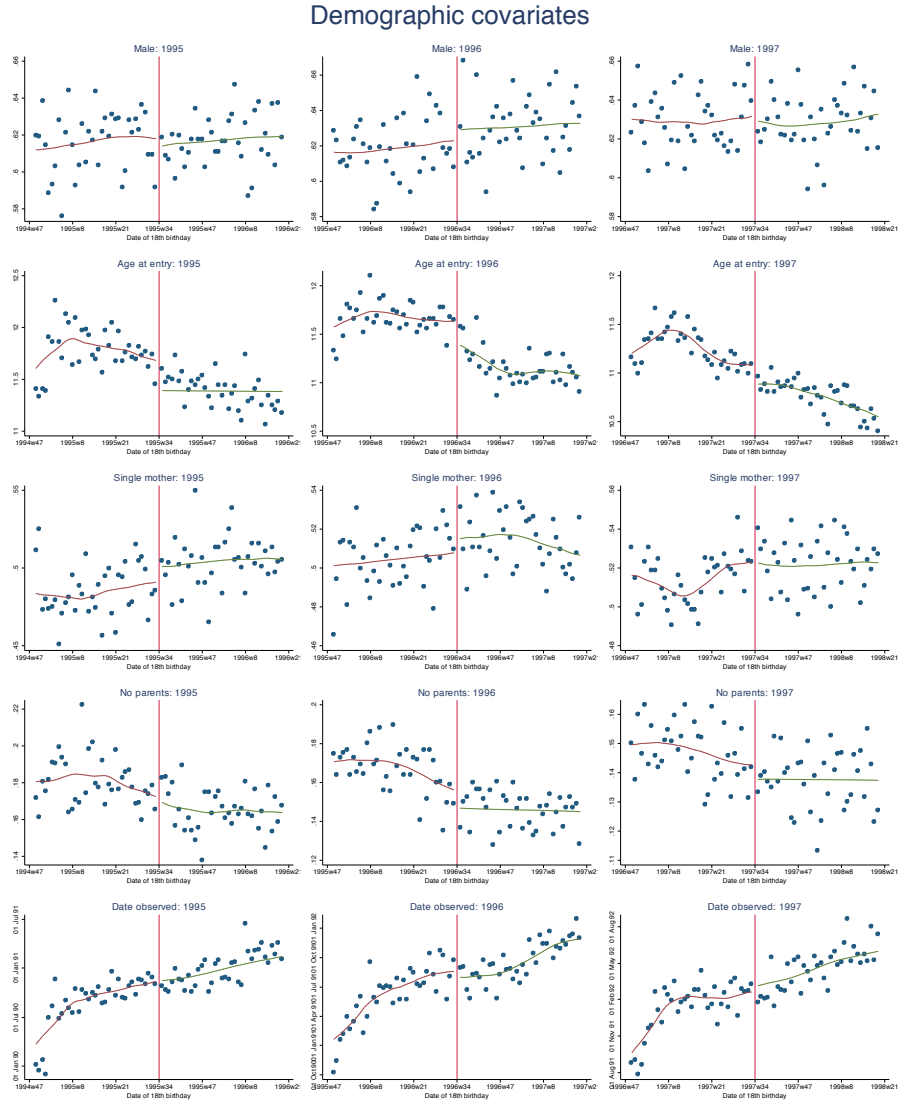
## Appendix Figures and Tables

Figure A.1: Enrollment in the SSI Children's Program, 1974-2011



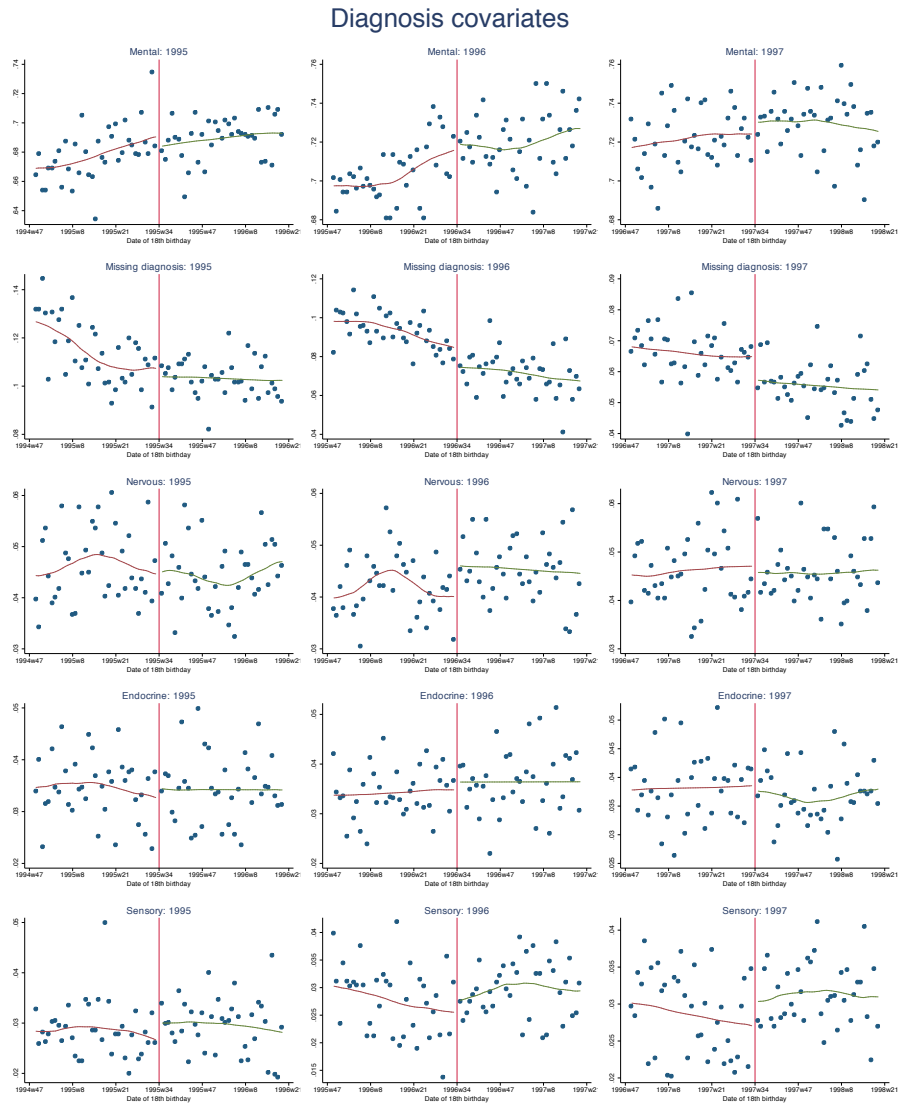
Source: SSI Annual Statistical Reports, 2002-2011.

Figure A.2: Covariate Balance Plots for 1995, 1996, 1997: Demographic Covariates



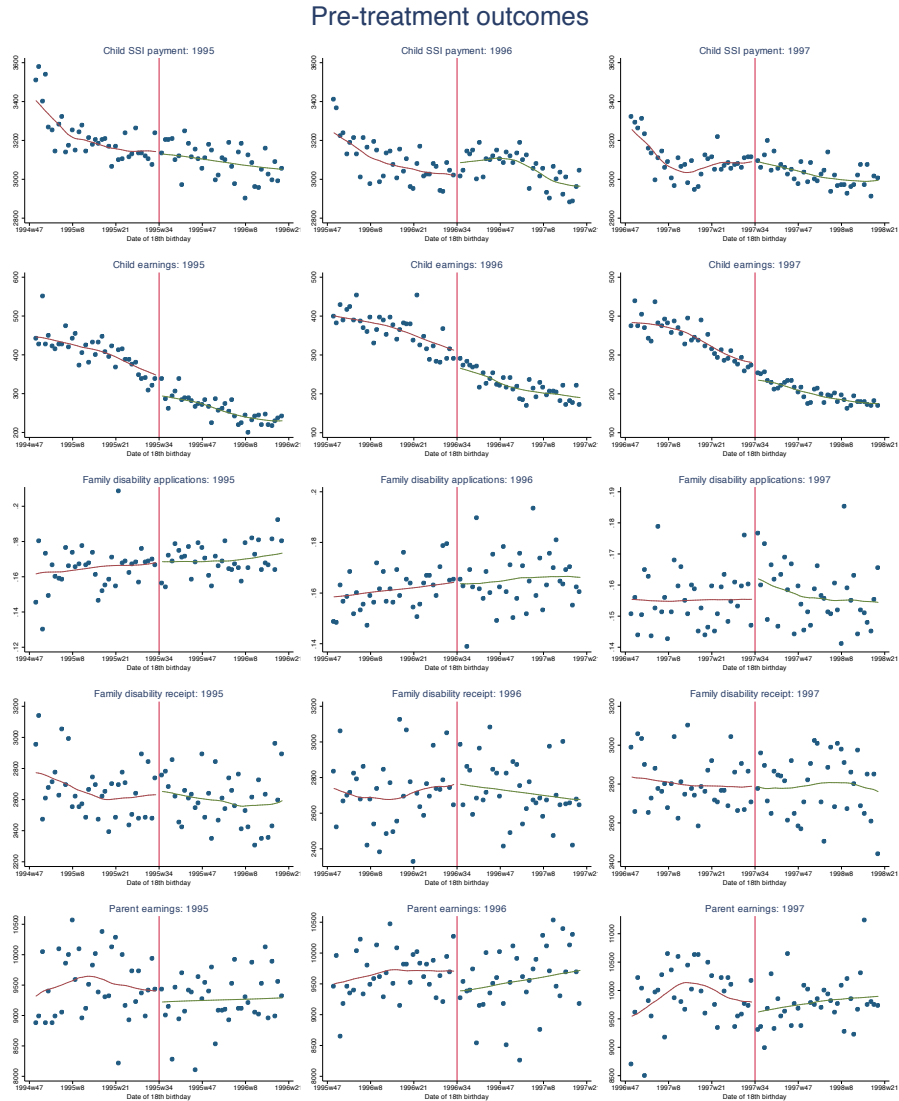
Notes: Graphs plot demographic covariates in the treatment year (1996) and the two neighboring years (1995 and 1997). Each graph plots the average of the covariate across SSI children in each birthweek bin. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in the indicated year.

Figure A.3: Covariate Balance Plots for 1995, 1996, 1997: Diagnosis Covariates



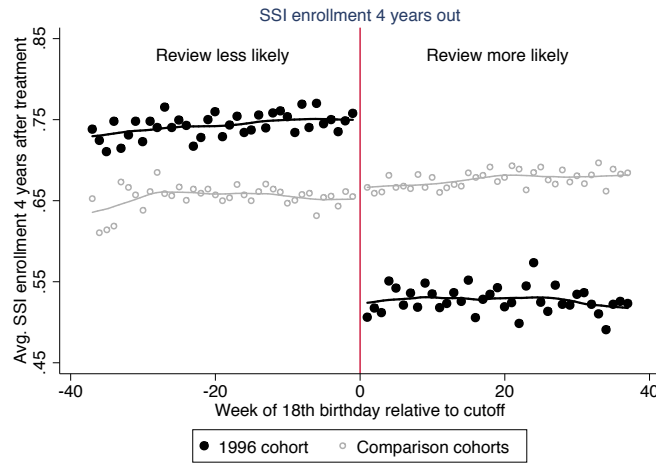
Notes: Graphs plot diagnosis covariates in the treatment year (1996) and the two neighboring years (1995 and 1997). Each graph plots the proportion of SSI children in each birthweek bin with the indicated primary diagnosis. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in the indicated year.

Figure A.4: Covariate Balance Plots for 1995, 1996, 1997: Pre-treatment Outcomes



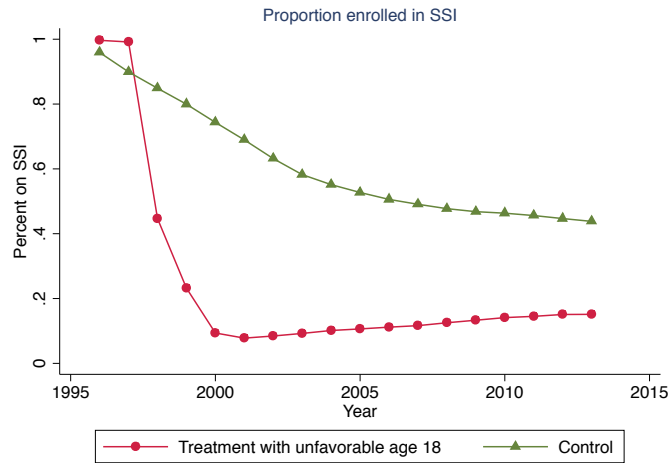
Notes: Graphs plot pre-treatment outcomes in the treatment year (1996) and the two neighboring years (1995 and 1997). Pre-treatment outcomes are annual averages taken over 1980 to 1996 for family outcomes and 1990 to 1996 for child outcomes. Each graph plots the average of the pre-treatment outcome across SSI children in each birthweek bin. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in the indicated year.

Figure A.5: First Stage Effect on SSI Enrollment



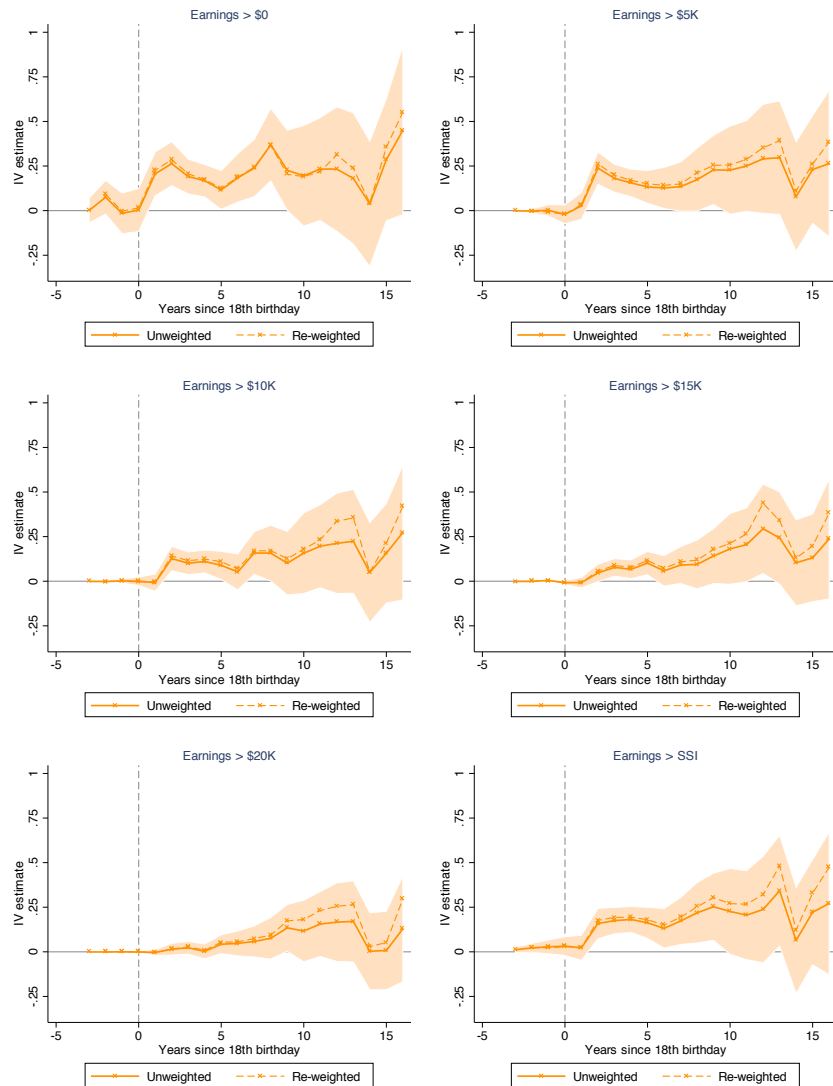
Notes: Figure plots average SSI enrollment four years after the year of the 18th birthday for each birthweek bin. Solid markers indicate the 1996 cohort, while hollow markers represent the comparison cohorts (1994, 1995, and 1997). Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997.

Figure A.6: Sources of Attenuation in the First Stage



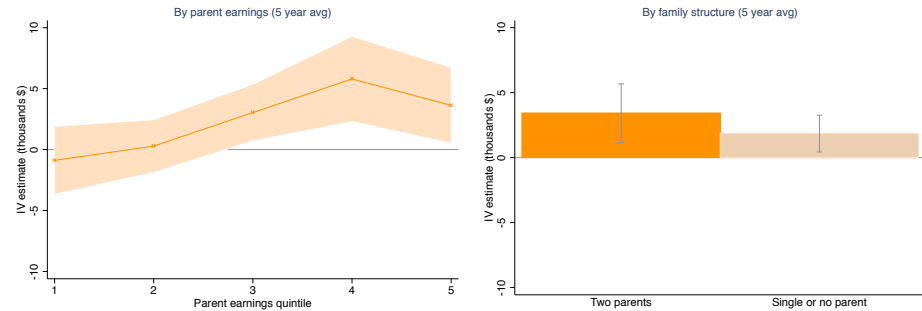
Notes: "Control" series plots the proportion of SSI children with an 18th birthday before the cutoff (less likely to get an age 18 review) who are on SSI in a given year. "Treatment with unfavorable age 18" series plots the proportion of SSI children with an 18th birthday after the cutoff and an unfavorable age 18 medical review who are on SSI in a given year.

Figure A.7: IV Estimates of the Effect of SSI Removal on Earnings Thresholds



Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI on earnings thresholds in each year, using a polynomial order of 2 with covariates. The solid lines represent unweighted IV estimates; the dashed lines represent IV estimates re-weighted by the year 2 complier population (see Section 4.2 for details). Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

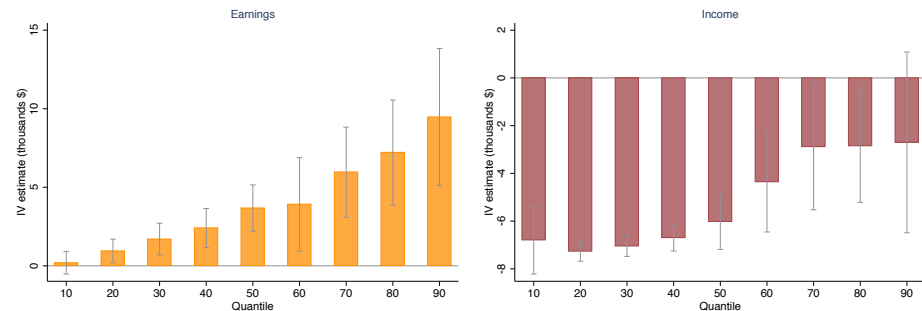
Figure A.8: Heterogeneity in the Earnings Response by Parental Earnings and Family Structure



Notes: Left panel plots parametric IV RD-DD estimates of the effect of being off of SSI on earnings in the first 5 years after age 18 by parental earnings quintile, using a polynomial order of 2. Individuals with no parents are assigned a parental earnings value of \$0. Right panel plots the same IV estimates by family structure. Shaded region (or error bar) is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

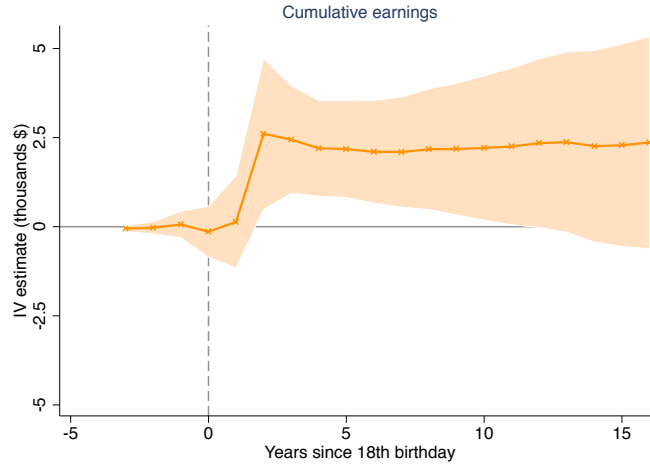
58

Figure A.9: Quantile IV Estimates for Earnings and Total Observed Income



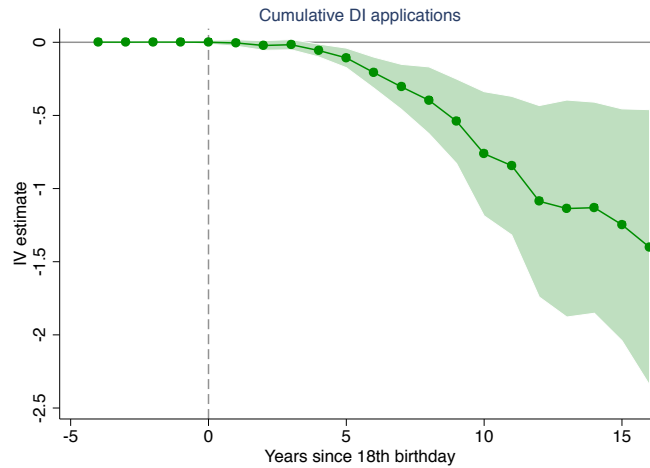
Notes: Graphs plot quantile IV RD estimates of the effect of being off of SSI on earnings and total observed income (earnings plus SSI income plus SSDI income), using the estimator in [Frandsen et al. \(2012\)](#) and [Melly \(2014\)](#)'s "rddqte" Stata command. Error bars are 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996.

Figure A.10: IV Estimates of the Effect of One Additional Year Off of SSI on Cumulative Earnings



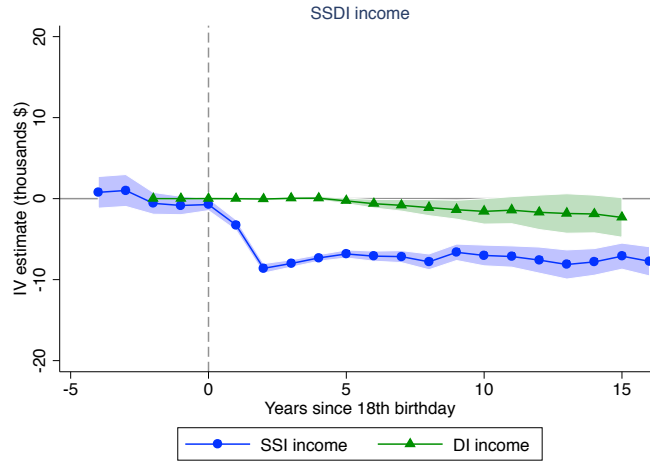
Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI *for one additional year* on cumulative earnings in each year, using a polynomial order of 2 with covariates. The endogenous regressor is cumulative years off of SSI up to the given year and the dependent variable is cumulative earnings up to that year. Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Figure A.11: IV Estimates of the Effect of SSI Removal on DI Applications



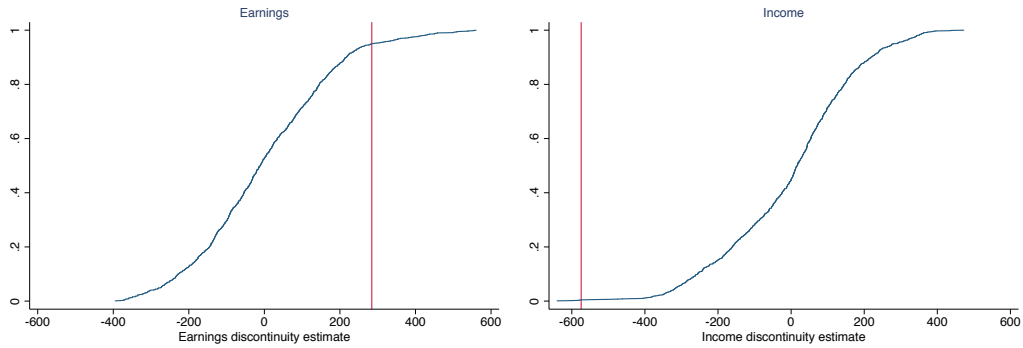
Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI on the cumulative number of the youth's Social Security Disability Insurance applications in each year, using a polynomial order of 2 with covariates. Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Figure A.12: IV Estimates of the Effect of SSI Removal on DI Income



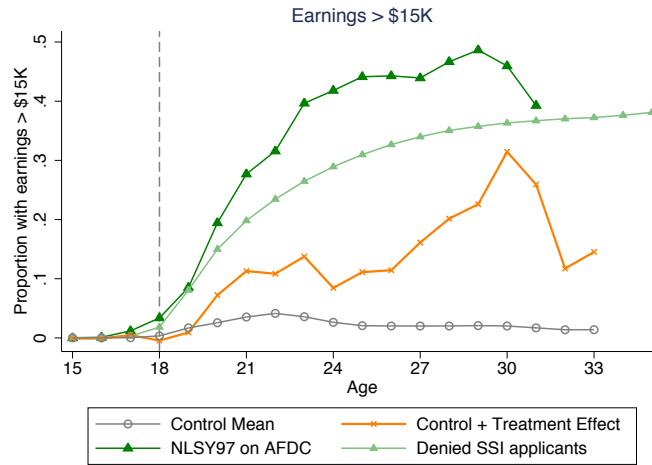
Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI on SSI income (circles) and Social Security Disability Insurance income (triangles) in each year, using a polynomial order of 2 with covariates. Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Figure A.13: Empirical CDFs of Earnings and Income Placebo RD Estimates



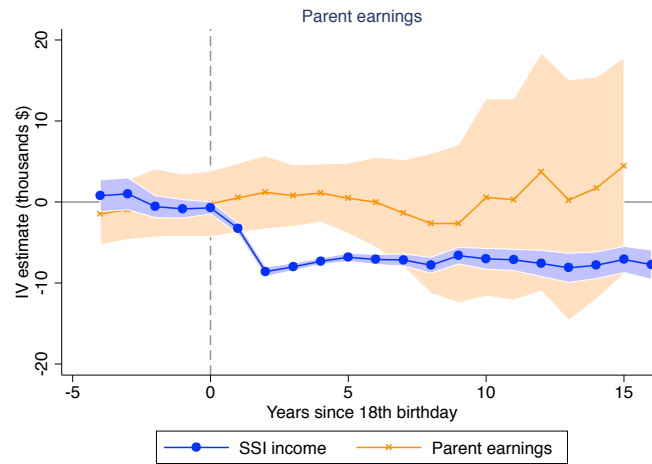
Notes: Left (right) panel plots empirical cumulative distribution function of earnings (income) RD placebo estimates, where placebo cutoff dates are every day in the year in 1995, 1996, and 1997. Sample is SSI children with an 18th birthday within 37 weeks of the placebo cutoff.

Figure A.14: Earnings of Removed SSI Youth vs. Broader Disadvantaged Population



Notes: Series marked with hollow circles is the likelihood of earning more than \$15,000 for control group members who are still on SSI in that year. Series marked with X's plot control on SSI mean plus the treatment effect. Series marked with dark triangles graphs the earnings of the sample of youth from the National Longitudinal Survey of Youth-1997 whose families were enrolled in the Aid to Families with Dependent Children program during their childhood. Series marked with light triangles graphs the earnings of SSI child applicants who were born before 1990, denied from SSI at least once as children, and never spent time on SSI.

Figure A.15: IV Estimates of the Effect of SSI Removal on Parental Earnings



Notes: Figure plots the parametric IV RD-DD estimate of the effect of being off SSI on SSI income (circles) and parents' earned income (X's) in each year, using a polynomial order of 2 with covariates. Shaded region is 95% confidence interval. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 and in 1994, 1995, and 1997. Standard errors clustered at individual level.

Table A.1: Comparison of Households with SSI Children to All Households with Children

	All households with children	Households with SSI children	Low-education households with children
Household size	3.9	4.1	4.2
Annual earnings	\$65,457	\$19,221	\$39,738
Annual total income	\$71,332	\$36,001	\$45,325
Black	17%	38%	19%
Single mother head	28%	58%	35%
High school dropout head	14%	25%	37%
Received child SSI	3%	100%	4%
Received cash public assistance	13%	100%	20%
Received cash or noncash public assistance	54%	100%	76%
Received free or reduced price lunch	36%	78%	54%
Received housing assistance	8%	28%	12%
Annual SSI income (child or adult)	\$375	\$3,708	\$589
Annual cash transfer income	\$750	\$8,684	\$1,150
N	10,375	277	3,750

Source: Author's calculations from Survey of Income and Program Dynamics 2008 Panel. Notes: Table presents estimates of household characteristics using longitudinal weights. "Low-education household" indicates a household whose head has a high school education or less. Noncash public assistance includes food stamps, WIC, Medicaid, rent for public housing or government subsidized rent, government energy assistance, free or reduced-price lunches, and free or reduced-price breakfasts. Housing assistance includes public housing, government subsidized rent, and Section 8 vouchers.

Table A.2: Standard RD Covariate Balance Tests at August 22 Using Linear Specification

	1996 cohort		1995 cohort		1997 cohort	
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.
<b>Demographics</b>						
Male	0.0038	(0.0066)	-0.0103	(0.0071)	-0.0062	(0.0062)
Age at entry	-0.314***	(0.0609)	0.177**	(0.0694)	-0.135**	(0.0554)
Single mother	0.0066	(0.0068)	0.0079	(0.0073)	0.00089	(0.0065)
No parents	-0.0062	(0.0049)	-0.0051	(0.0055)	-0.0018	(0.0045)
Record date	-87.7***	(18.4)	-74.9***	(20.4)	-50.1***	(17.2)
<b>Diagnosis</b>						
Mental	-0.0038	(0.0062)	-0.0124*	(0.0067)	0.0046	(0.0058)
None	-0.0068*	(0.0037)	0.0054	(0.0045)	-0.0039	(0.0031)
Nervous	0.0050*	(0.0028)	-0.0033	(0.0030)	-0.00082	(0.0027)
Endocrine	-0.00061	(0.0025)	0.0009	(0.0026)	-0.00087	(0.0025)
Sensory	0.0043*	(0.0023)	0.0027	(0.0024)	0.0051**	(0.0022)
Infection	-0.0016	(0.0019)	-0.0023	(0.0020)	5.69e-05	(0.0018)
Musculoskeletal	0.00027	(0.0015)	0.0007	(0.0016)	-0.0019	(0.0013)
Respiratory	0.00051	(0.0014)	0.0012	(0.0014)	-0.00094	(0.0014)
Neoplasm	0.00042	(0.0013)	0.0025*	(0.0015)	-0.0014	(0.0013)
<b>Pre-treatment...</b>						
Child SSI payment	152.1***	(28.8)	80.4**	(32.8)	71.8***	(25.7)
Child earnings	-34.7***	(9.9)	-31.5***	(10.6)	-25.6***	(7.15)
Family dis. apps	-0.0055	(0.0042)	-0.0048	(0.0049)	0.0040	(0.0036)
Family dis. receipt	39.7	(73.2)	75.8	(79.6)	45.9	(68.9)
Parent earnings	-574.3***	(182.0)	-351.5*	(196.2)	-429.3**	(172.6)
N	81,799		71,941		90,501	
Joint F test	88.85		51.77		46.82	
p-value	0.0000		0.0041		0.0143	

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents covariate balance tests for the linear standard RD specification. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in the given year (1995, 1996, or 1997). Standard errors shown in parentheses.

Table A.3: Standard RD Covariate Balance Tests at August 22 Using Quadratic Specification

	1996 cohort		1995 cohort		1997 cohort	
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.
<b>Demographics</b>						
Male	0.0039	(0.0098)	-0.0120	(0.0105)	-0.0093	(0.0092)
Age at entry	-0.048	(0.0898)	0.054	(0.103)	-0.027	(0.082)
Single mother	-2.37e-05	(0.0101)	-0.0070	(0.0107)	-0.0059	(0.0096)
No parents	0.0015	(0.0072)	0.0104	(0.0082)	0.0040	(0.0067)
Record date	0.9350	(27.2)	3.457	(30.1)	-4.93	(25.4)
<b>Diagnosis</b>						
Mental	-0.0035	(0.0091)	-0.0160	(0.0099)	0.0016	(0.0085)
None	-0.0052	(0.0055)	-0.00068	(0.0067)	-0.0040	(0.0046)
Nervous	0.0074*	(0.0041)	0.0033	(0.0044)	0.0029	(0.0040)
Endocrine	-0.00028	(0.0038)	0.0034	(0.0038)	0.0027	(0.0037)
Sensory	-0.00047	(0.0034)	0.0016	(0.0036)	0.0021	(0.0032)
Infection	-0.0013	(0.0028)	0.0003	(0.0030)	-0.0027	(0.0026)
Musculoskeletal	0.0014	(0.0021)	0.00078	(0.0024)	-0.0013	(0.0018)
Respiratory	0.00022	(0.0022)	0.00074	(0.0020)	-0.0023	(0.0020)
Neoplasm	0.00085	(0.0020)	0.0023	(0.0022)	-0.0021	(0.0020)
<b>Pre-treatment...</b>						
Child SSI payment	11.4	(42.5)	-13.7	(48.5)	-0.439	(37.9)
Child earnings	-0.709	(13.2)	1.25	(15.4)	6.65	(10.5)
Family dis. apps	-0.0088	(0.0062)	-0.0022	(0.0072)	0.0059	(0.0053)
Family dis. receipt	-45.9	(107.6)	70.4	(120.2)	-49.7	(102.2)
Parent earnings	-421.5	(268.8)	44.4	(292.4)	-119.8	(254.4)
N	81,799		71,941		90,501	
Joint F test	23.18		21.04		17.61	
p-value	0.7238		0.8238		0.9355	

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Table presents covariate balance tests for the quadratic standard RD specification. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in the given year (1995, 1996, or 1997). Standard errors shown in parentheses.

Table A.5: Falsification Covariate Balance Tests

	Percent of days with p-value below...			
	0.05	0.01	0.001	0.0001
Linear specification				
RD 1995	80%	67%	59%	49%
RD 1996 (treatment)	75%	67%	61%	53%
RD 1997	75%	68%	53%	43%
RD-DD	15%	7%	0%	0%
Quadratic specification				
RD 1995	16%	6%	1%	0%
RD 1996 (treatment)	21%	10%	4%	0%
RD 1997	18%	10%	3%	1%
RD-DD	7%	2%	0%	0%

Notes: Table reports the results of covariate balance falsification tests for the standard RD in each of the years 1995, 1996, and 1997, as well as the RD-DD that compares 1996 to surrounding years. Percentages are the proportion of days in each year in which the joint F-test rejects the null hypothesis of covariate balance, using the same covariates from Table 2. The idea behind the test is that if covariates are balanced throughout the year, then the rejection rates of the joint F-test should equal the significance level of the test.

Table A.4: Covariate Balance Tests at August 22 Using Local Linear Regression with Different Bandwidths

	Bandwidth: 100		Bandwidth: 150		Bandwidth: 200	
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.
<b>Demographics</b>						
Male	0.00960	(0.0105)	0.00501	(0.00872)	0.00256	(0.00766)
Age at entry	-0.0523	(0.0966)	-0.125	(0.0800)	-0.189***	(0.0704)
Single mother	0.000187	(0.0109)	-0.000505	(0.00900)	0.00205	(0.00791)
No parents	0.000129	(0.00770)	-0.00157	(0.00641)	-0.00218	(0.00565)
Date observed	-11.67	(29.25)	-23.07	(24.22)	-47.90**	(21.27)
<b>Diagnosis</b>						
Mental	-0.00371	(0.00983)	-0.00410	(0.00813)	-0.00490	(0.00714)
None	-0.00203	(0.00319)	-0.00226	(0.00260)	-0.00228	(0.00227)
Nervous	0.00595	(0.00434)	0.00710*	(0.00363)	0.00652**	(0.00319)
Endocrine	0.00224	(0.00411)	-0.000165	(0.00338)	0.000248	(0.00296)
Sensory	0.000389	(0.00363)	0.00110	(0.00298)	0.00189	(0.00260)
Infection	-0.00108	(0.00310)	-0.00125	(0.00254)	-0.00130	(0.00221)
Musculoskeletal	0.00346	(0.00226)	0.00152	(0.00189)	0.000744	(0.00167)
Respiratory	0.00115	(0.00246)	0.000236	(0.00197)	0.000447	(0.00170)
Neoplasm	-0.000233	(0.00211)	0.000431	(0.00175)	0.000881	(0.00154)
<b>Pre-treatment...</b>						
Child SSI payment	28.18	(45.77)	50.42	(37.89)	86.72***	(33.30)
Child earnings	-57.75	(115.6)	-7.459	(96.26)	-11.13	(84.81)
Family disability applications	-0.0107	(0.00673)	-0.00647	(0.00555)	-0.00710	(0.00489)
Family disability receipt	3.346	(14.86)	-2.220	(11.76)	-19.62*	(10.60)
Parent earnings	-516.7*	(289.0)	-401.6*	(239.9)	-481.6**	(211.0)
N	32,808		47,844		63,131	
Joint F test	26.49		29.64		41.05	
p-value	0.4918		0.3304		0.0407	

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Table presents covariate balance tests for local linear regression with the indicated bandwidth measured in days. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996. Standard errors shown in parentheses.

Table A.6: RD-DD IV Estimates Using Off SSI, No Covariates

	Linear		Quadratic		Cubic		Quartic		Control mean	N
	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.		
Earnings and income (annual)										
SSI income	-7,828***	(210)	-7,795***	(325)	-8,000***	(401)	-8,270***	(488)	\$4,055	300,899
Earnings	3,894***	(997)	2,534	(1,610)	2,927	(1,968)	1,664	(2,426)	\$4,222	300,899
Earnings > \$0	0.281***	(0.0439)	0.220***	(0.0695)	0.248***	(0.0845)	0.266***	(0.101)	0.406	300,899
Earnings > \$15K	0.125***	(0.0280)	0.110**	(0.0442)	0.134**	(0.0539)	0.0798	(0.0665)	0.103	300,899
DI income	-360	(251)	-742*	(398)	-386	(489)	-91.3	(588)	\$688	300,899
Cumulative DI applications	-0.484***	(0.127)	-0.782***	(0.211)	-0.341	(0.244)	-0.400	(0.298)	0.375	300,899
Total observed income	-4,553***	(1,067)	-6,260***	(1,733)	-5,666***	(2,113)	-6,953***	(2,607)	\$9,041	300,899
Volatility measures										
CV of income	1.138***	(0.0898)	1.183***	(0.139)	1.167***	(0.170)	1.219***	(0.205)	0.682	300,899
CV of detrended income	1.446***	(0.0879)	1.404***	(0.135)	1.294***	(0.160)	1.371***	(0.197)	0.458	300,899
SD of income	1,531**	(599)	448	(969)	864	(1,177)	-51.2	(1,453)	\$4,155	300,899
SD of log income	1.805***	(0.199)	1.781***	(0.312)	1.864***	(0.381)	2.041***	(0.454)	1.626	300,899
Annual % income change	1.562***	(0.140)	1.509***	(0.219)	1.374***	(0.268)	1.619***	(0.322)	0.652	300,899
Years with 50+% income change	0.847***	(0.103)	0.820***	(0.162)	0.857***	(0.198)	0.894***	(0.237)	0.522	300,899
CV of earnings	-0.561***	(0.165)	-0.624**	(0.257)	-0.123	(0.314)	0.0299	(0.379)	1.363	300,899
CV of income (bounded)	1.286***	(0.0769)	1.207***	(0.117)	1.108***	(0.139)	1.176***	(0.171)	0.431	300,899
CV of income (median regression)	0.993***	(0.173)							0.682	300,899
Annual $\Delta$ in earnings (abs. val.)	1,533***	(365)	892	(591)	1,153	(719)	1,199	(861)	\$2,041	300,899
$\Delta$ earnings from turnover (abs. val.)	4,456***	(1,361)	2,374	(2,010)	4,260*	(2,435)	2,347	(2,964)	\$4,379	300,899
$\Delta$ earnings within job (abs. val.)	5,818***	(1,479)	3,386	(2,225)	5,322**	(2,690)	3,271	(3,286)	\$5,543	300,899
Parent and sibling income (annual)										
Parent earnings	-408	(2,308)	1,286	(3,658)	1,043	(4,542)	3,349	(5,389)	\$11,974	265,600
Parent and sib disability apps	-0.0481**	(0.0211)	-0.0743**	(0.0339)	-0.0212	(0.0416)	-0.0435	(0.0502)	0.089	265,085
Parent and sib disability income	-569	(921)	-171.2	(1,458)	-509	(1,827)	-3,248	(2,233)	\$4,812	265,086

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD IV estimates without covariates of the effect of being off SSI in the 16-year post-period on outcomes. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.7: RD-DD IV Estimates Using Off SSI, With Covariates

	Linear		Quadratic		Cubic		Quartic		Control mean	N
	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.		
Earnings and income (annual)										
SSI income	-7,827***	(193.3)	-7,704***	(305)	-8,083***	(395)	-8,199***	(503)	\$4,055	300,887
Earnings	4,124***	(940.8)	2,638*	(1,551)	2,446	(1,994)	642	(2,609)	\$4,222	300,887
Earnings > \$0	0.305***	(0.0413)	0.240***	(0.0664)	0.253***	(0.0845)	0.251**	(0.107)	0.406	300,887
Earnings > \$15K	0.129***	(0.0266)	0.113***	(0.0429)	0.123**	(0.0547)	0.0549	(0.0715)	0.103	300,887
DI income	-338	(240.6)	-734*	(388)	-425	(497)	-164	(631)	\$688	300,887
Cumulative DI applications	-0.423***	(0.120)	-0.728***	(0.201)	-0.343	(0.247)	-0.447	(0.319)	0.375	300,887
Total observed income	-4,299***	(1,001)	-6,052***	(1,657)	-6,280***	(2,135)	-7,993***	(2,794)	\$9,041	300,887
Volatility measures										
CV of income	1.116***	(0.0864)	1.164***	(0.137)	1.156***	(0.174)	1.214***	(0.221)	0.682	300,887
CV of detrended income	1.438***	(0.0841)	1.392***	(0.131)	1.301***	(0.164)	1.411***	(0.213)	0.458	300,887
SD of income	1,668***	(560.4)	532	(923)	449	(1,186)	-715	(1,552)	\$4,155	300,887
SD of log income	1.806***	(0.192)	1.801***	(0.305)	1.822***	(0.390)	2.017***	(0.490)	1.626	300,887
Annual % income change	1.573***	(0.135)	1.528***	(0.216)	1.356***	(0.274)	1.645***	(0.348)	0.652	300,887
Years with 50+% income change	0.849***	(0.0990)	0.831***	(0.158)	0.841***	(0.202)	0.871***	(0.254)	0.522	300,887
CV of earnings	-0.512***	(0.157)	-0.587**	(0.248)	-0.156	(0.319)	0.0241	(0.406)	1.363	300,887
CV of income (bounded)	1.282***	(0.0737)	1.201***	(0.114)	1.111***	(0.142)	1.212***	(0.185)	0.431	300,887
Annual $\Delta$ in earnings (abs. val.)	1,668***	(341.0)	976*	(561)	956	(720)	855	(916)	\$2,041	300,887
$\Delta$ earnings from turnover (abs. val.)	4,670***	(1,293)	2,516	(1,951)	3,846	(2,479)	1,410	(3,188)	\$4,379	300,887
$\Delta$ earnings within job (abs. val.)	6,106***	(1,403)	3,588*	(2,152)	4,835*	(2,733)	2,187	(3,527)	\$5,543	300,887
Parent and sibling income (annual)										
Parent earnings	1,440	(1,691)	3,557	(2,700)	1,952	(3,499)	6,486	(4,410)	\$11,974	265,592
Parent and sib disability apps	-0.0428**	(0.0199)	-0.0691**	(0.0321)	-0.0182	(0.0414)	-0.0493	(0.0523)	0.089	265,077
Parent and sib disability income	-580	(880.3)	-11.7	(1,401)	-461	(1,836)	-3,367	(2,347)	\$4,812	265,078

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Table presents parametric RD-DD IV estimates with covariates of the effect of being off SSI in the 16-year post-period on outcomes. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.8: RD-DD IV Estimates Using Age 18 Removal, No Covariates

	Linear		Quadratic		Cubic		Quartic		Control mean	N
	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.		
Earnings and income (annual)										
SSI income	-2,139***	(115)	-2,207***	(185)	-2,524***	(251)	-2,628***	(303)	\$4,055	300,899
Earnings	-98.4	(68.5)	-210*	(111)	-122	(154)	-29.0	(187)	\$4,222	300,899
Earnings > \$0	-0.132***	(0.0330)	-0.221***	(0.0542)	-0.108	(0.0746)	-0.127	(0.0911)	0.406	300,899
Earnings > \$15K	1,064***	(291)	717	(477)	924	(652.6)	529	(794)	0.103	300,899
DI income	0.0767***	(0.0131)	0.0622***	(0.0213)	0.0783***	(0.0290)	0.0845**	(0.0350)	\$688	300,899
Cumulative DI applications	0.0342***	(0.0082)	0.0313**	(0.0133)	0.0422**	(0.0182)	0.0254	(0.0221)	0.375	300,899
Total observed income	-1,244***	(280)	-1,773***	(459)	-1,788***	(630)	-2,210***	(766)	\$9,041	300,899
Volatility measures										
CV of income	0.311***	(0.0288)	0.335***	(0.0462)	0.368***	(0.0628)	0.388***	(0.0760)	0.682	300,899
CV of detrended income	0.395***	(0.0237)	0.398***	(0.0378)	0.408***	(0.0514)	0.436***	(0.0625)	0.458	300,899
SD of income	418**	(171)	127	(278)	273	(381)	-16.3	(461)	\$4,155	300,899
SD of log income	0.493***	(0.0628)	0.504***	(0.101)	0.588***	(0.138)	0.649***	(0.166)	1.626	300,899
Annual % income change	0.427***	(0.0406)	0.427***	(0.0661)	0.434***	(0.0904)	0.515***	(0.108)	0.652	300,899
Years with 50+% income change	0.232***	(0.0314)	0.232***	(0.0509)	0.270***	(0.0692)	0.284***	(0.0833)	0.522	300,899
CV of earnings	-0.153***	(0.0454)	-0.177**	(0.0730)	-0.0387	(0.0995)	0.0095	(0.120)	1.363	300,899
CV of income (bounded)	0.351***	(0.0203)	0.342***	(0.0326)	0.350***	(0.0445)	0.374***	(0.0540)	0.431	300,899
CV of income (median regression)	0.233***	(0.0270)							0.682	
Parent and sibling income (annual)										
Parent earnings	-113	(642)	365	(1,038)	327	(1,423)	1,058	(1,704)	\$11,974	265,600
Parent and sib disability apps	-0.0134**	(0.0058)	-0.0212**	(0.0095)	-0.0067	(0.0130)	-0.0137	(0.0157)	0.089	265,085
Parent and sib disability income	-159	(257)	-48.9	(416)	-160	(574)	-1,024	(699)	\$4,812	265,086

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD IV estimates without covariates of the effect of age 18 removal on outcomes. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.9: RD-DD IV Estimates Using Age 18 Removal, With Covariates

	Linear		Quadratic		Cubic		Quartic		Control mean	N
	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.		
Earnings and income (annual)										
SSI income	-2,190***	(107)	-2,194***	(172)	-2,471***	(235)	-2,413***	(285)	\$4,055	300,887
Earnings	-94.7	(67.2)	-209*	(109)	-130	(151)	-48.2	(186)	\$4,222	300,887
Earnings > \$0	-0.118***	(0.0323)	-0.207***	(0.0531)	-0.105	(0.0734)	-0.132	(0.0904)	0.406	300,887
Earnings > \$15K	1,154***	(279)	751	(460)	748	(633)	189	(776)	0.103	300,887
DI income	0.0852***	(0.0125)	0.0684***	(0.0203)	0.0773***	(0.0278)	0.0738**	(0.0338)	\$688	300,887
Cumulative DI applications	0.0362***	(0.0079)	0.0322**	(0.0129)	0.0376**	(0.0177)	0.0162	(0.0217)	0.375	300,887
Total observed income	-1,203***	(272)	-1,723***	(447)	-1,920***	(617)	-2,352***	(756)	\$9,041	300,887
Volatility measures										
CV of income	0.312***	(0.0280)	0.332***	(0.0450)	0.353***	(0.0613)	0.357***	(0.0748)	0.682	300,887
CV of detrended income	0.402***	(0.0230)	0.396***	(0.0368)	0.398***	(0.0502)	0.415***	(0.0615)	0.458	300,887
SD of income	467***	(163)	151	(267)	137	(367)	-211	(447)	\$4,155	300,887
SD of log income	0.505***	(0.0607)	0.513***	(0.0983)	0.557***	(0.134)	0.593***	(0.163)	1.626	300,887
Annual % income change	0.440***	(0.0391)	0.435***	(0.0639)	0.415***	(0.0877)	0.484***	(0.105)	0.652	300,887
Years with 50+% income change	0.237***	(0.0303)	0.237***	(0.0492)	0.257***	(0.0672)	0.256***	(0.0815)	0.522	300,887
CV of earnings	-0.143***	(0.0444)	-0.167**	(0.0716)	-0.0476	(0.0980)	0.0071	(0.119)	1.363	300,887
CV of income (bounded)	0.359***	(0.0197)	0.342***	(0.0317)	0.340***	(0.0434)	0.357***	(0.0532)	0.431	300,887
Parent and sibling income (annual)										
Parent earnings	408	(479)	1,022	(774)	593.7	(1,064)	1,909	(1,281)	\$11,974	265,592
Parent and sib disability apps	-0.0121**	(0.0056)	-0.0199**	(0.0091)	-0.0055	(0.0126)	-0.0145	(0.0153)	0.089	265,077
Parent and sib disability income	-164	(250)	-3.373	(405)	-141	(560)	-991	(685)	\$4,812	265,078

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD IV estimates with covariates of the effect of age 18 removal on outcomes. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.10: RD-DD Reduced Form Estimates, No Covariates

	Polynomial		Linear		Quadratic		Cubic		Quartic		N
	AIC	Bins	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	
First stage											
Received age 18 review	1	4	0.902***	(0.00366)	0.863***	(0.00560)	0.830***	(0.00761)	0.833***	(0.00935)	300,899
Unfavorable age 18	1	1	0.405***	(0.00509)	0.383***	(0.00800)	0.378***	(0.0109)	0.381***	(0.0132)	300,899
Annual SSI enrollment	1	1	-0.111***	(0.00595)	-0.109***	(0.00912)	-0.119***	(0.0123)	-0.121***	(0.0149)	300,899
Earnings and income (annual)											
SSI income	1	1	-866.5***	(49.36)	-846.3***	(75.43)	-955.1***	(101.5)	-1,002***	(123.1)	300,899
Earnings	1	1	431.0***	(118.6)	275.1	(183.9)	349.5	(248.7)	201.5	(304.0)	300,899
Earnings > \$0	1	1	0.0311***	(0.00541)	0.0238***	(0.00829)	0.0296***	(0.0112)	0.0322**	(0.0136)	300,899
Earnings > \$15K	1	1	0.0139***	(0.00334)	0.0120**	(0.00515)	0.0160**	(0.00696)	0.00966	(0.00849)	300,899
DI income	1	1	-39.87	(27.79)	-80.55*	(42.83)	-46.11	(58.23)	-11.05	(71.27)	300,899
Cumulative DI applications	1	1	-0.0536***	(0.0133)	-0.0849***	(0.0205)	-0.0407	(0.0281)	-0.0485	(0.0345)	300,899
Total observed income	1	1	-504.0***	(112.9)	-679.7***	(174.9)	-676.5***	(236.8)	-842.0***	(289.5)	300,899
Volatility measures											
CV of income	1	1	0.126***	(0.0119)	0.128***	(0.0181)	0.139***	(0.0243)	0.148***	(0.0296)	300,899
CV of detrended income	1	1	0.160***	(0.00986)	0.152***	(0.0150)	0.154***	(0.0201)	0.166***	(0.0245)	300,899
SD of income	1	1	169.5**	(69.68)	48.59	(106.9)	103.2	(144.8)	-6.202	(175.7)	300,899
SD of log income	1	1	0.200***	(0.0259)	0.193***	(0.0397)	0.222***	(0.0534)	0.247***	(0.0648)	300,899
Annual % income change	1	1	0.173***	(0.0169)	0.164***	(0.0261)	0.164***	(0.0353)	0.196***	(0.0425)	300,899
Years with 50+% income change	1	1	0.0938***	(0.0129)	0.0890***	(0.0199)	0.102***	(0.0268)	0.108***	(0.0325)	300,899
CV of earnings	1	1	-0.0621***	(0.0184)	-0.0677**	(0.0280)	-0.0146	(0.0376)	0.00362	(0.0459)	300,899
CV of income (bounded)	1	1	0.142***	(0.00849)	0.131***	(0.0129)	0.132***	(0.0174)	0.142***	(0.0213)	300,899
Parent and sibling income (annual)											
Parent earnings	1	1	-46.72	(264.4)	141.8	(403.7)	124.6	(543.0)	407.3	(655.6)	265,600
Parent and sib disability apps	1	4	-0.00553**	(0.00240)	-0.00825**	(0.00368)	-0.00254	(0.00497)	-0.00527	(0.00603)	265,085
Parent and sib disability income	1	1	-65.43	(106.1)	-19.04	(162.2)	-61.00	(219.2)	-394.1	(268.2)	265,086
Sibling earnings in adulthood	1	1	-446.3**	(198.7)	-672.6**	(302.1)	-377.1	(405.4)	-624.3	(494.6)	80,943
Sibling earnings > \$0	1	1	-0.0148	(0.0114)	-0.0298*	(0.0171)	-0.0140	(0.0228)	-0.0166	(0.0274)	80,943
Sibling earnings > \$15K	1	1	-0.0138**	(0.00590)	-0.0197**	(0.00891)	-0.0119	(0.0119)	-0.0167	(0.0143)	80,943

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD reduced form estimates without covariates. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses. "AIC" indicates the Akaike Information Criterion goodness-of-fit method for selecting the optimal polynomial order; "Bins" indicates the bin selection method outlined in Lee and Lemieux (2010).

Table A.11: RD-DD Reduced Form Estimates, With Covariates

	Polynomial		Linear		Quadratic		Cubic		Quartic		N
	AIC	Bins	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	
First stage											
Received age 18 review	1	4	0.903***	(0.00365)	0.864***	(0.00557)	0.832***	(0.00755)	0.836***	(0.00927)	300,887
Unfavorable age 18	1	1	0.409***	(0.00494)	0.386***	(0.00774)	0.380***	(0.0106)	0.380***	(0.0128)	300,887
Annual SSI enrollment	1	1	-0.115***	(0.00553)	-0.110***	(0.00847)	-0.116***	(0.0114)	-0.112***	(0.0138)	300,887
Earnings and income (annual)											
SSI income	1	1	-896.5***	(45.89)	-847.6***	(70.07)	-938.8***	(94.25)	-916.8***	(114.2)	300,887
Earnings	1	1	472.3***	(115.1)	290.3	(178.5)	284.2	(241.6)	71.83	(295.4)	300,887
Earnings > \$0	1	1	0.0349***	(0.00519)	0.0264***	(0.00795)	0.0294***	(0.0107)	0.0280**	(0.0131)	300,887
Earnings > \$15K	1	1	0.0148***	(0.00325)	0.0124**	(0.00501)	0.0143**	(0.00678)	0.00614	(0.00827)	300,887
DI income	1	1	-38.75	(27.54)	-80.80*	(42.37)	-49.35	(57.61)	-18.30	(70.57)	300,887
Cumulative DI applications	1	1	-0.0484***	(0.0131)	-0.0801***	(0.0203)	-0.0399	(0.0278)	-0.0500	(0.0342)	300,887
Total observed income	1	1	-492.4***	(111.0)	-665.9***	(172.1)	-729.4***	(233.1)	-893.8***	(285.0)	300,887
Volatility measures											
CV of income	1	1	0.128***	(0.0116)	0.128***	(0.0177)	0.134***	(0.0237)	0.136***	(0.0288)	300,887
CV of detrended income	1	1	0.165***	(0.00961)	0.153***	(0.0146)	0.151***	(0.0195)	0.158***	(0.0239)	300,887
SD of income	1	1	191.1***	(67.19)	58.51	(103.3)	52.13	(139.6)	-79.98	(169.5)	300,887
SD of log income	1	1	0.207***	(0.0252)	0.198***	(0.0386)	0.212***	(0.0520)	0.226***	(0.0631)	300,887
Annual % income change	1	1	0.180***	(0.0164)	0.168***	(0.0253)	0.157***	(0.0341)	0.184***	(0.0412)	300,887
Years with 50+% income change	1	1	0.0972***	(0.0126)	0.0914***	(0.0193)	0.0976***	(0.0260)	0.0975***	(0.0315)	300,887
CV of earnings	1	1	-0.0586***	(0.0182)	-0.0646**	(0.0277)	-0.0181	(0.0372)	0.00269	(0.0454)	300,887
CV of income (bounded)	1	1	0.147***	(0.00826)	0.132***	(0.0126)	0.129***	(0.0169)	0.136***	(0.0207)	300,887
Parent and sibling income (annual)											
Parent earnings	1	1	169.4	(198.9)	400.6	(303.3)	227.2	(407.4)	732.8	(491.8)	265,592
Parent and sib disability apps	1	4	-0.00504**	(0.00233)	-0.00783**	(0.00358)	-0.00212	(0.00482)	-0.00557	(0.00586)	265,077
Parent and sib disability income	1	1	-68.43	(104.0)	-1.325	(158.9)	-53.88	(214.7)	-380.3	(262.9)	265,078
Sibling earnings in adulthood	1	1	-390.3**	(193.1)	-612.1**	(294.5)	-372.3	(395.7)	-465.8	(483.6)	79,497
Sibling earnings > \$0	1	1	-0.0119	(0.0108)	-0.0201	(0.0162)	-0.0101	(0.0216)	-0.00276	(0.0260)	79,497
Sibling earnings > \$15K	1	1	-0.0122**	(0.00578)	-0.0179**	(0.00871)	-0.0104	(0.0116)	-0.0118	(0.0141)	79,497

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD reduced form estimates with covariates. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses. "AIC" indicates the Akaike Information Criterion goodness-of-fit method for selecting the optimal polynomial order; "Bins" indicates the bin selection method outlined in Lee and Lemieux (2010).

Table A.12: Standard RD Reduced Form Estimates, No Covariates

	Polynomial		Linear		Quadratic		Cubic		Quartic		N
	AIC	Bins	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	
First stage											
Received age 18 review	1	4	0.866***	(0.0032)	0.866***	(0.0048)	0.865***	(0.0065)	0.867***	(0.0081)	81,800
Unfavorable age 18	1	1	0.372***	(0.0047)	0.372***	(0.0070)	0.384***	(0.0093)	0.394***	(0.0117)	81,800
Annual SSI enrollment	1	1	-0.0942***	(0.0053)	-0.0989***	(0.0078)	-0.104***	(0.0103)	-0.110***	(0.0129)	81,800
Earnings and income (annual)											
SSI income	1	1	-754***	(43.6)	-772***	(64.3)	-841***	(85.1)	-934***	(106)	81,800
Earnings	1	1	320.5***	(106)	271*	(160)	325	(213)	201	(267)	81,800
Earnings > \$0	1	1	0.0238***	(0.0048)	0.0233***	(0.0071)	0.0311***	(0.0095)	0.0372***	(0.0118)	81,800
Earnings > \$15K	1	1	0.0102***	(0.0030)	0.0112**	(0.0045)	0.0137**	(0.0060)	0.0088	(0.0075)	81,800
DI income	1	1	-32.0	(24.5)	-53.9	(36.6)	-24.6	(49.3)	18.8	(62.0)	81,800
Cumulative DI applications	1	1	-0.0544***	(0.0118)	-0.0794***	(0.0176)	-0.0424*	(0.0238)	-0.0311	(0.0299)	81,800
Total observed income	1	1	-492***	(100)	-583***	(152)	-566***	(203)	-743***	(254)	81,800
Volatility measures											
CV of income	1	1	0.112***	(0.0106)	0.120***	(0.0156)	0.123***	(0.0206)	0.132***	(0.0256)	81,800
CV of detrended income	1	1	0.154***	(0.0087)	0.151***	(0.0128)	0.148***	(0.0169)	0.165***	(0.0210)	81,800
SD of income	1	1	120*	(62.7)	76.3	(92.0)	76.1	(125)	-27.4	(156)	81,800
SD of log income	1	1	0.167***	(0.0230)	0.171***	(0.0340)	0.180***	(0.0451)	0.212***	(0.0561)	81,800
Annual % income change	1	1	0.156***	(0.0151)	0.162***	(0.0226)	0.153***	(0.0300)	0.192***	(0.0370)	81,800
Years with 50+% income change	1	1	0.0876***	(0.0116)	0.0875***	(0.0172)	0.0967***	(0.0228)	0.109***	(0.0284)	81,800
CV of earnings	1	1	-0.0436***	(0.0162)	-0.0699***	(0.0240)	-0.0308	(0.0319)	-0.0068	(0.0397)	81,800
CV of income (bounded)	1	1	0.133***	(0.0075)	0.131***	(0.0110)	0.130***	(0.0147)	0.148***	(0.0183)	81,800
Parent and sibling income (annual)											
Parent earnings	1	1	-603**	(235)	-124	(346)	-238	(458)	-423	(567)	72,413
Parent and sib disability apps	1	4	-0.0027	(0.0021)	-0.0064**	(0.0032)	-0.0022	(0.0042)	-0.0049	(0.0053)	72,271
Parent and sib disability income	1	1	-40.8	(94.1)	-90.0	(139)	-57.9	(185)	-210	(232)	72,274
Sibling earnings in adulthood	1	1	-367**	(176)	-527**	(260)	-386	(344)	-645	(427)	22,070
Sibling earnings > \$0	1	1	-0.0182*	(0.0101)	-0.0294**	(0.0146)	-0.0237	(0.0190)	-0.0226	(0.0233)	22,070
Sibling earnings > \$15K	1	1	-0.0123**	(0.0052)	-0.0157**	(0.0076)	-0.0089	(0.0100)	-0.0165	(0.0123)	22,070

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric standard RD reduced form estimates without covariates. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996. Standard errors clustered at individual level shown in parentheses. "AIC" indicates the Akaike Information Criterion goodness-of-fit method for selecting the optimal polynomial order; "Bins" indicates the bin selection method outlined in Lee and Lemieux (2010).

Table A.13: Standard RD Reduced Form Estimates, With Covariates

	Polynomial		Linear		Quadratic		Cubic		Quartic		N
	AIC	Bins	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	Pt. Est.	Std Err.	
First stage											
Received age 18 review	1	4	0.864***	(0.0032)	0.866***	(0.0048)	0.865***	(0.0064)	0.867***	(0.0081)	81,800
Unfavorable age 18	1	1	0.375***	(0.0045)	0.377***	(0.0068)	0.387***	(0.0090)	0.394***	(0.0113)	81,800
Annual SSI enrollment	1	1	-0.0987***	(0.0049)	-0.104***	(0.0072)	-0.104***	(0.0096)	-0.106***	(0.0119)	81,800
Earnings and income (annual)											
SSI income	1	1	-786***	(40.5)	-818***	(59.6)	-862***	(78.9)	-889***	(98.1)	81,800
Earnings	1	1	377***	(102)	311**	(155)	318	(207)	152	(260)	81,800
Earnings > \$0	1	1	0.0281***	(0.0046)	0.0272***	(0.0069)	0.0327***	(0.0091)	0.0363***	(0.0114)	81,800
Earnings > \$15K	1	1	0.0116***	(0.0029)	0.0124***	(0.0044)	0.0134**	(0.0058)	0.0074	(0.0073)	81,800
DI income	1	1	-27.3	(24.3)	-57.2	(36.2)	-28.3	(48.7)	17.7	(61.3)	81,800
Cumulative DI applications	1	1	-0.0489***	(0.0117)	-0.0727***	(0.0174)	-0.0396*	(0.0235)	-0.0305	(0.0296)	81,800
Total observed income	1	1	-464***	(98.6)	-592***	(149)	-599***	(200)	-749***	(250)	81,800
Volatility measures											
CV of income	1	1	0.115***	(0.0103)	0.124***	(0.0152)	0.122***	(0.0200)	0.125***	(0.0249)	81,800
CV of detrended income	1	1	0.158***	(0.0084)	0.155***	(0.0124)	0.149***	(0.0164)	0.162***	(0.0205)	81,800
SD of income	1	1	154**	(60.4)	91.7	(88.8)	61.7	(120)	-55.4	(151)	81,800
SD of log income	1	1	0.176***	(0.0224)	0.183***	(0.0331)	0.180***	(0.0439)	0.200***	(0.0546)	81,800
Annual % income change	1	1	0.162***	(0.0146)	0.171***	(0.0219)	0.154***	(0.0291)	0.186***	(0.0359)	81,800
Years with 50+% income change	1	1	0.0910***	(0.0113)	0.0936***	(0.0167)	0.0964***	(0.0222)	0.102***	(0.0276)	81,800
CV of earnings	1	1	-0.0396**	(0.0161)	-0.0685***	(0.0238)	-0.0332	(0.0316)	-0.0087	(0.0394)	81,800
CV of income (bounded)	1	1	0.138***	(0.0073)	0.135***	(0.0107)	0.130***	(0.0143)	0.145***	(0.0178)	81,800
Parent and sibling income (annual)											
Parent earnings	1	1	-97.7	(177)	181	(260)	55.6	(344)	296	(426)	72,413
Parent and sib disability apps	1	4	-0.0032	(0.0021)	-0.0057*	(0.0031)	-0.0020	(0.0041)	-0.0061	(0.0051)	72,271
Parent and sib disability income	1	1	-63.6	(92.2)	-63.0	(136)	-70.0	(181)	-228	(228)	72,274
Sibling earnings in adulthood	1	1	-315*	(171)	-576**	(254)	-439	(336)	-594	(420)	21,676
Sibling earnings > \$0	1	1	-0.0133	(0.0095)	-0.0250*	(0.0138)	-0.0178	(0.0180)	-0.0093	(0.0221)	21,676
Sibling earnings > \$15K	1	1	-0.0107**	(0.0051)	-0.0169**	(0.0074)	-0.0097	(0.0098)	-0.0147	(0.0120)	21,676

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric standard RD reduced form estimates with covariates. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996. Standard errors clustered at individual level shown in parentheses. "AIC" indicates the Akaike Information Criterion goodness-of-fit method for selecting the optimal polynomial order; "Bins" indicates the bin selection method outlined in Lee and Lemieux (2010).

Table A.14: RD-DD Local Linear Regression Reduced Form Estimates: Disability Enrollment and Income

h	Annual average SSI enrollment				Annual average SSI income				Annual average DI income				N	
	No covariates		With covariates		No covariates		With covariates		No covariates		With covariates		No Cov	With
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.		
50	-0.117***	(0.0137)	-0.112***	(0.0127)	-974.9***	(113.3)	-937.4***	(105.2)	-53.01	(65.34)	-60.74	(64.75)	64,005	63,999
60	-0.114***	(0.0126)	-0.111***	(0.0117)	-939.2***	(104.0)	-913.1***	(96.51)	-45.89	(59.64)	-53.54	(59.07)	75,861	75,855
70	-0.116***	(0.0117)	-0.112***	(0.0108)	-948.5***	(96.37)	-912.7***	(89.41)	-15.53	(55.26)	-21.72	(54.71)	87,686	87,680
80	-0.115***	(0.0109)	-0.112***	(0.0102)	-924.2***	(90.44)	-889.9***	(83.94)	-13.16	(51.79)	-18.90	(51.24)	99,127	99,120
90	-0.117***	(0.0104)	-0.114***	(0.00961)	-939.7***	(85.54)	-904.1***	(79.45)	-27.88	(48.84)	-33.36	(48.28)	110,489	110,482
100	-0.116***	(0.00984)	-0.114***	(0.00913)	-917.9***	(81.28)	-894.7***	(75.52)	-59.02	(46.40)	-63.81	(45.85)	121,948	121,941
110	-0.114***	(0.00940)	-0.113***	(0.00873)	-885.2***	(77.70)	-876.3***	(72.17)	-73.89*	(44.26)	-75.76*	(43.75)	133,168	133,160
120	-0.113***	(0.00902)	-0.114***	(0.00837)	-877.4***	(74.52)	-886.3***	(69.21)	-75.70*	(42.42)	-75.99*	(41.93)	144,579	144,571
130	-0.111***	(0.00870)	-0.113***	(0.00807)	-869.1***	(71.89)	-885.9***	(66.75)	-62.76	(40.86)	-62.85	(40.39)	155,562	155,554
140	-0.111***	(0.00840)	-0.113***	(0.00779)	-867.3***	(69.47)	-881.6***	(64.48)	-56.30	(39.42)	-56.01	(38.98)	166,771	166,763
150	-0.108***	(0.00814)	-0.110***	(0.00755)	-848.7***	(67.34)	-865.0***	(62.52)	-49.45	(38.16)	-49.77	(37.74)	177,848	177,839
160	-0.109***	(0.00790)	-0.112***	(0.00733)	-853.4***	(65.32)	-871.6***	(60.64)	-52.04	(37.02)	-52.28	(36.61)	189,205	189,196
170	-0.111***	(0.00768)	-0.114***	(0.00713)	-870.3***	(63.56)	-891.3***	(59.01)	-60.92*	(35.96)	-60.64*	(35.57)	200,475	200,466
180	-0.110***	(0.00750)	-0.113***	(0.00696)	-858.9***	(62.03)	-881.1***	(57.58)	-67.37*	(35.09)	-67.03*	(34.71)	211,662	211,653
190	-0.110***	(0.00735)	-0.112***	(0.00682)	-860.8***	(60.87)	-879.8***	(56.50)	-67.52**	(34.39)	-67.85**	(34.02)	223,137	223,128
200	-0.109***	(0.00722)	-0.112***	(0.00670)	-852.0***	(59.76)	-873.5***	(55.48)	-67.25**	(33.76)	-66.81**	(33.39)	234,290	234,281
210	-0.110***	(0.00709)	-0.113***	(0.00658)	-853.8***	(58.67)	-874.8***	(54.45)	-69.05**	(33.12)	-68.17**	(32.76)	245,668	245,659
220	-0.110***	(0.00695)	-0.113***	(0.00645)	-852.9***	(57.57)	-872.7***	(53.43)	-66.77**	(32.50)	-66.55**	(32.15)	256,863	256,854
230	-0.109***	(0.00682)	-0.112***	(0.00633)	-852.8***	(56.51)	-873.3***	(52.44)	-56.35*	(31.90)	-56.12*	(31.55)	267,980	267,970
240	-0.110***	(0.00671)	-0.113***	(0.00622)	-856.8***	(55.54)	-876.2***	(51.54)	-53.34*	(31.34)	-53.06*	(31.01)	278,098	278,087
250	-0.110***	(0.00660)	-0.113***	(0.00612)	-858.8***	(54.66)	-879.4***	(50.74)	-53.25*	(30.84)	-52.35*	(30.51)	287,884	287,873
260	-0.110***	(0.00650)	-0.113***	(0.00603)	-859.2***	(53.86)	-882.7***	(50.00)	-51.83*	(30.38)	-51.05*	(30.07)	297,580	297,568

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents RD-DD local linear regression reduced form estimates. Sample is SSI children with an 18th birthday within a given bandwidth of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.15: RD-DD Local Linear Regression Reduced Form Estimates: Earnings and Income

h	Annual average earnings				Annual average observed income				Coefficient of variation of income				N	
	No covariates		With covariates		No covariates		With covariates		No covariates		With covariates		No Cov	With
	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.	Pt. Est.	Std. Err.		
50	148.6	(280.4)	97.10	(272.2)	-905.9***	(267.0)	-927.5***	(262.7)	0.146***	(0.0272)	0.140***	(0.0266)	64,005	63,999
60	223.4	(256.4)	160.6	(248.8)	-789.5***	(244.1)	-834.2***	(240.2)	0.152***	(0.0249)	0.147***	(0.0243)	75,861	75,855
70	282.6	(237.4)	228.5	(230.4)	-709.4***	(226.0)	-733.9***	(222.4)	0.146***	(0.0231)	0.141***	(0.0226)	87,686	87,680
80	227.7	(222.6)	178.1	(216.2)	-738.0***	(211.8)	-758.9***	(208.5)	0.143***	(0.0217)	0.138***	(0.0212)	99,127	99,120
90	304.4	(210.6)	249.6	(204.5)	-690.8***	(200.5)	-715.5***	(197.2)	0.136***	(0.0205)	0.132***	(0.0200)	110,489	110,482
100	265.0	(200.2)	225.1	(194.4)	-739.0***	(190.4)	-760.6***	(187.4)	0.140***	(0.0195)	0.135***	(0.0190)	121,948	121,941
110	300.5	(191.1)	275.6	(185.6)	-685.5***	(181.8)	-703.6***	(178.9)	0.135***	(0.0187)	0.132***	(0.0182)	133,168	133,160
120	360.7**	(183.0)	359.0**	(177.7)	-619.1***	(174.1)	-630.4***	(171.3)	0.131***	(0.0179)	0.129***	(0.0175)	144,579	144,571
130	340.6*	(176.4)	355.1**	(171.2)	-617.9***	(167.8)	-620.7***	(165.1)	0.127***	(0.0173)	0.127***	(0.0169)	155,562	155,554
140	362.8**	(170.2)	372.3**	(165.1)	-587.4***	(161.9)	-592.3***	(159.2)	0.127***	(0.0167)	0.126***	(0.0163)	166,771	166,763
150	345.7**	(164.7)	366.4**	(159.8)	-578.7***	(156.7)	-574.9***	(154.0)	0.123***	(0.0162)	0.123***	(0.0158)	177,848	177,839
160	373.9**	(159.7)	405.0***	(154.9)	-558.4***	(151.9)	-546.1***	(149.3)	0.121***	(0.0157)	0.121***	(0.0153)	189,205	189,196
170	389.8**	(155.3)	423.1***	(150.6)	-568.5***	(147.6)	-556.4***	(145.1)	0.125***	(0.0153)	0.125***	(0.0149)	200,475	200,466
180	358.0**	(151.3)	390.7***	(146.8)	-596.0***	(143.9)	-585.7***	(141.5)	0.127***	(0.0149)	0.128***	(0.0145)	211,662	211,653
190	355.1**	(148.3)	387.3***	(143.9)	-601.0***	(141.0)	-588.4***	(138.6)	0.129***	(0.0146)	0.130***	(0.0143)	223,137	223,128
200	341.1**	(145.4)	375.9***	(141.0)	-605.9***	(138.2)	-592.7***	(135.9)	0.129***	(0.0143)	0.130***	(0.0140)	234,290	234,281
210	344.6**	(142.5)	378.6***	(138.3)	-606.3***	(135.6)	-592.9***	(133.3)	0.130***	(0.0141)	0.131***	(0.0137)	245,668	245,659
220	352.7**	(139.9)	385.5***	(135.7)	-595.3***	(133.0)	-582.5***	(130.8)	0.128***	(0.0138)	0.130***	(0.0135)	256,863	256,854
230	356.7***	(137.2)	391.0***	(133.1)	-581.1***	(130.5)	-567.4***	(128.3)	0.127***	(0.0136)	0.128***	(0.0132)	267,980	267,970
240	380.1***	(134.9)	412.2***	(130.8)	-558.8***	(128.3)	-546.2***	(126.1)	0.126***	(0.0133)	0.127***	(0.0130)	278,098	278,087
250	381.5***	(132.7)	417.8***	(128.7)	-559.2***	(126.3)	-543.1***	(124.1)	0.127***	(0.0131)	0.128***	(0.0128)	287,884	287,873
260	381.2***	(130.8)	417.6***	(126.8)	-558.3***	(124.4)	-545.1***	(122.3)	0.127***	(0.0129)	0.128***	(0.0126)	297,580	297,568

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents RD-DD local linear regression reduced form estimates. Sample is SSI children with an 18th birthday within a given bandwidth of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.16: IV Estimates Using Off SSI, Relative to Control Group On SSI

	IV estimate		Full control group		Control on SSI	
	Pt. Est.	Std. Err.	Mean	%Δ	Mean	%Δ
SSI income	-\$7,704***	(305)	\$4,055	-190%	\$6,835	-113%
DI income	-\$734*	(388)	\$688	-107%	\$618	-119%
Earnings	\$2,638*	(1,551)	\$4,222	62%	\$1,386	190%
Earnings thresholds						
> \$0	0.240***	(0.0664)	0.406	59%	0.287	83%
> \$5K	0.196***	(0.0574)	0.214	92%	0.090	217%
> \$10K	0.131***	(0.0504)	0.149	88%	0.047	281%
> \$15K	0.113***	(0.0429)	0.103	110%	0.022	506%
> \$20K	0.0599*	(0.0361)	0.070	86%	0.010	600%
> SSI	0.199***	(0.0554)	0.195	102%	0.077	259%
Total income	-\$6,052***	(1,657)	\$9,041	-67%	\$8,839	-68%
N	300,899					

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table presents parametric RD-DD IV estimates of the effect of being off of the SSI program, using a polynomial order of 2 based on covariate balance results. Estimates are given as average annual measures. "Full control group" gives the mean for all sample members with an 18th birthday before August 22, 1996; "control on SSI" gives the mean for those control group members who stay on SSI in a given year, averaged over all 16 post-treatment years. Sample is SSI children with an 18th birthday within 37 weeks of the August 22 cutoff in 1996 (treatment year) and 1994, 1995, and 1997 (comparison years). Standard errors clustered at individual level shown in parentheses.

Table A.17: Descriptive Survey Statistics for Former SSI Children Ages 22 to 24 Years

	Full sample			Living apart from parents		
	All	Still On	Off SSI	All	Still On	Off SSI
<b>Living arrangements</b>						
Lives with parents	54%	60%	45%			
Lives with own child	18%	15%	24%			
<b>Health insurance</b>						
Any	77%	96%	52%			
Medicaid	63%	90%	23%			
<b>Financial assistance</b>						
Non-SSI cash welfare	10%	11%	8%	15%	19%	10%
Food Stamps	27%	26%	28%	39%	44%	34%
Any public assistance	30%	29%	31%	43%	50%	35%
Transfers from family outside HH	9%	6%	16%	19%	13%	27%
<b>N</b>	989	616	373	421	238	183

Source: Author's calculations from National Survey of SSI Children and Families (NSCF). Notes: Table reports proportions for all individuals in the NSCF between the ages of 22 and 24 years who were on SSI as children, and for the subsample of these individuals who live apart from parents. "Still On" means the former SSI child is still on SSI at the time of the survey. "Off SSI" means the former SSI child is no longer on SSI at the time of the survey.

Table A.18: Optimal SSI Benefit Calculations

	Relative risk aversion							
	0.5	1	1.5	2	2.5	3	3.5	4
<b>No chance of SSI removal in adulthood</b>								
Not accounting for consumption volatility								
Able comparison: HS graduate-dropout average	\$3,500	\$10,100	\$12,200	\$13,300	\$14,000	\$14,400	\$14,700	\$15,000
Able comparison: HS graduate	\$6,300	\$14,000	\$16,600	\$17,900	\$18,700	\$19,200	\$19,600	\$19,800
Accounting for consumption volatility								
Able comparison: HS graduate-dropout average	\$3,100	\$8,000	\$9,100	\$9,300	\$9,300	\$9,200	\$9,100	\$9,000
Able comparison: HS graduate	\$5,500	\$11,200	\$12,300	\$12,500	\$12,400	\$12,300	\$12,100	\$11,900
<b>Medium chance of SSI removal in adulthood</b>								
Accounting for consumption volatility								
Able comparison: HS graduate-dropout average	\$3,100	\$8,100	\$9,200	\$9,500	\$9,500	\$9,400	\$9,300	\$9,200
Able comparison: HS graduate	\$5,500	\$11,300	\$12,500	\$12,700	\$12,700	\$12,500	\$12,300	\$12,200
<b>High chance of SSI removal in adulthood</b>								
Accounting for consumption volatility								
Able comparison: HS graduate-dropout average	\$3,300	\$8,800	\$10,300	\$10,700	\$10,900	\$11,000	\$10,900	\$10,900
Able comparison: HS graduate	\$5,800	\$12,300	\$13,900	\$14,400	\$14,600	\$14,600	\$14,500	\$14,400

Notes: Table presents optimal benefit calculations using equation (10). Estimates of the earnings elasticity and the slope of disabled consumption with respect to the SSI benefit come from Table 3. Estimates of able-bodied consumption and the intercept for disabled consumption come from the March Supplement to the 1997 Current Population Survey. See Appendix for details.