

# FINANCIAL INCENTIVES FOR SPECIAL EDUCATION PLACEMENT: THE IMPACT OF SSI BENEFIT EXPANSION ON SPECIAL EDUCATION ENROLLMENT\*

Jessica L. Cohen<sup>†</sup>  
Massachusetts Institute of Technology

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## Abstract

The fraction of enrolled students diagnosed with a disability and in Special Education (SE) has climbed from 11 to nearly 14 percent since 1990. Why the prevalence of child disabilities has grown so much and why it varies so substantially across states is not well-understood. A number of studies have shown the importance of school-based incentives on the supply of SE services made available to students. However, the extent to which parental demand for SE services responds to incentives, and how much of the variation in SE enrollment can be explained by these incentives, is unknown. The 1990 Supreme Court Zebley decision led to a substantial widening of child eligibility criteria for SSI. I use this legislative change, in combination with cross-state variation in the financial gain to enrolling in SSI, as an instrument for child SSI enrollment. This estimation strategy allows me to isolate the direct impact of shifts in SSI benefit supply on SE enrollment. I find that the financial incentives brought on by the Zebley decision led to a 15 percent increase in SE enrollment. I also estimate that a modest 1.5 percent of the cross-state variation in SE enrollment can be explained by differences in financial incentives to enroll in SSI. These results suggest that parents respond to incentives to have their child screened for a disability and placed in SE.

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<sup>†</sup>E-mail: j\_cohen@mit.edu

# 1 Introduction

In 2005, more than 6.7 million U.S. public school students were deemed disabled under the Individuals with Disabilities Education Act and were receiving Special Education services. While all public schools face uniform federal guidelines for the diagnosis of disabilities, there is substantial variation across states in the fraction of students enrolled in SE. For example, while only 7 percent of the child population in California and Colorado are in SE, over 12 percent are in SE in New Jersey and West Virginia. Only a small amount of this variation can be explained by factors that we would expect to influence the presence of child disabilities, such as poverty (Losen and Orfield 2002).<sup>1</sup> While every student with a disability is legally entitled to SE services, vague disability guidelines leave room for discretion in SE placement and have led to substantial variation in the supply of SE services made available to students. For example, schools have been shown to respond to fiscal and disciplinary incentives in determining SE placement (Cohen 2006, Jacob 2006, Cullen 2003).

While strategic considerations seem to be a factor in the supply of SE services made available by schools, not much is known about whether the demand for SE services is also responsive to incentives. The decision to screen a child for a disability is typically made by the student's parent or teacher. Factors influencing parental demand for SE placement may include the quality of SE services, time costs of applying to SE and individual perception of the net benefit of SE placement. This paper uses variation in the generosity of benefits a disabled child can receive under the Supplemental Security Income (SSI) program as a measure of incentives to have a child enrolled in SE. I use temporal and cross-state variation in the benefit to enrolling a child in SSI to analyze how responsive demand for SE enrollment is to fiscal incentives and how much of the cross-state variation in SE growth this demand response can explain.

SSI is a cash-transfer program for aged, blind and disabled individuals who are below federally-determined income and asset limits. Originally a small program serving a primar-

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<sup>1</sup>Poverty is strongly correlated with low birth weight, which is a factor in the development of some learning disabilities (Vohr, et al. 2000, Breslau et al. 2004).

ily elderly population, SSI has grown to provide assistance to over a million disabled children. Growth in child SSI receipt was precipitated by the 1990 *Sullivan v. Zebley* Supreme Court decision, which significantly liberalized the standards for a child to qualify for SSI for a mental or emotional disability. High SSI benefits levels, coupled with the increasing diagnosis of mild learning and emotional disorders in the late 1980s, led to a dramatic increase in child SSI applications after the *Zebley* decision. In the five years after *Zebley*, child SSI enrollment grew from .26 to nearly 1 million, a 264 percent increase (SSA Annual Statistical Supplement, various years).

This substantial increase in child SSI enrollment did not occur uniformly across states. Kubik (1999) and Garrett and Gleid (2000) demonstrate that one major predictor of post-*Zebley* SSI growth was the difference across states in the interaction between SSI and Aid to Families with Dependent Children (AFDC) benefit schedules. While SSI benefit levels are set nationally, AFDC/TANF benefit levels are set by the state and vary widely.<sup>2</sup> Since a child cannot receive AFDC and SSI benefits simultaneously, but a family can, states in which the gain to a family of switching a child from AFDC to SSI was higher experienced larger increases in post-*Zebley* child SSI enrollment. The individual incentive to switch assistance programs was facilitated by cash-strapped state welfare offices, which benefited from shifting people from AFDC, which is funded jointly by the federal and state governments, to SSI, which is almost entirely federally-funded (Schmidt and Sevak 2004, Kubik 2003).

While more generous benefits for children should clearly lead parents to increase their demand for child SSI enrollment, the child must first be deemed disabled. The criteria for a child to be eligible for SSI are very similar to those for Special Education.<sup>3</sup> Both programs look for evidence of a disability from the standard battery of tests, from information provided by parents and teachers, and from “functional assessments.”<sup>4</sup> Under the Individuals with Disabilities Education

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<sup>2</sup>For example, in 1990 a single mother with two children on AFDC could receive \$166 a month in Alabama, whereas in California, she would receive a monthly benefit of \$980.

<sup>3</sup>SSI eligibility requires that the disability be expected to last at least 12 months. On the other hand, some children qualify for SE for disabilities that are usually temporary, such as speech and language disorders.

<sup>4</sup>Roughly 70 percent of students assessed for SE are ultimately placed in the program (Ysseldyke, et al. 1997).

Act (IDEA), parents of children in public schools are entitled to a free disability screening for their child. The IDEA includes broad definitions of disabilities entitling a child to SE, but state educational agencies are free to implement more precise diagnostic guidelines.<sup>5</sup> Beyond the presence of a disability, both SE and SSI require evidence that the disability impedes the child's ability to function in an age-appropriate manner. For the majority of children, functionality is assessed based on school performance. While SE enrollment is not an official requirement for SSI placement (since there are no educational requirements for the latter), it is a *de facto* requirement for school-age children.

Parents incur zero financial cost for a Special Education screening, but are responsible for all expenses incurred in providing evidence of a child's disability to SSI. Thus, it is likely that a parent who wanted to apply for SSI would first request that the school conduct a disability assessment for SE. However, there are a number of reasons why parents might not request to have their child screened. First, they may not know the symptoms of childhood disabilities or that their child is exhibiting these symptoms in school. Many mental and emotional disabilities—including those severe enough to entitle a child to SSI—go undiagnosed and untreated among children (Cuffe et al. 2005). Even if parents believe that their child might be disabled, they may be unwilling to incur the opportunity cost of the initial screening and future re-assessments.<sup>6</sup> Parents may also choose not to have their child assessed for a disability because they perceive SE placement to be costly for the child. Students may benefit from SE placement because of the extra attention and accommodations. On the other hand, SE placement could be harmful to children if being diagnosed with a disability leads to lower expectations of parents, teachers and future employers. The net benefit of SE placement is not well-established, and parents face significant uncertainty about whether their particular child will benefit from SE services.

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<sup>5</sup>For example, one of the criteria in the federal definition of a learning disability is that a “severe discrepancy” exists between a child's ability (IQ) and achievement levels, but state educational agencies can specify what test results would qualify as severe.

<sup>6</sup>Parents must participate in much of the process for SE screening and placement. For example, parents must be present when the child's Individualized Education Program (IEP) is crafted by teachers and administrators, and must be present at reviews of the child's progress that occur at least annually.

Whether parents are unaware that their child may be disabled or unwilling to have the child screened for a disability, the increase in SSI benefit generosity after 1990 should have made parents more likely to request a disability screening for SE for their child.<sup>7</sup> This incentive should have been strongest for low-income parents.<sup>8</sup> A large fraction of the SE student population comes from households which are likely to qualify for welfare programs. The National Longitudinal Transition Survey (NLTS) is a nationally-representative survey of middle- and high-school children with disabilities conducted in 1987 and gives some picture of the demographics of the SE population a few years before *Zebly*. 35 percent of SE children lived in a single-parent household and 68 percent of their parents had a high school diploma or less. Over 26 percent of SE children lived with a household head that was unemployed. Many SE children came from households already receiving federal assistance: 27 percent had parents receiving SSI and Medicaid income, 10 percent had parents receiving Social Security Disability Income and nearly 10 percent had parents on AFDC (NLTS 1987). These figures probably underestimate the degree of poverty in the SE population prior to *Zebly*, since elementary school children in SE (who are not represented in the NLTS) tend to have more severe disabilities, more likely to stem from conditions associated with poverty such as low birth-weight.

The magnitude of the spillovers from increasing SSI benefit generosity to SE enrollment depends on how well schools are able to identify disabled children and make SE services available to them. A number of studies, although a bit outdated, have shown that not all students who meet the criteria for a disability are receiving SE services (Ysseldyke et al. 1983, Ysseldyke, et al. 1982). This is partly the result of the broad and inconsistently applied guidelines for diagnosing mental and emotional disabilities. Even if schools identified disabled children more consistently, they still are likely to restrict the supply of SE services available to students. Excess demand for SE services results from the scarcity of certified SE teachers and only partially-funded state

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<sup>7</sup>Throughout this paper, I use “benefit generosity” to refer both to the level of benefits and to the leniency of the criteria for receiving benefits.

<sup>8</sup>It is likely that middle-income parents faced some incentive as well, since SSI income and asset caps are generous and parents probably faced some uncertainty about whether or not they would qualify for SSI.

SE programs.

I find that the increase in the supply of SSI benefits brought on by *Zebley* led to a 15 percent increase in SE enrollment. These results suggest that SE enrollment is very responsive to financial incentives. I also find that 1.5 percent of the variation in SE enrollment across states can be explained by variation in the level of financial incentives to enroll in SSI. While most of the research on SE has focused on the supply of SE services and school-based incentives, these results suggest that parental incentives are an important factor in SE enrollment and in the identification of disabilities among children in general.

In the next section I describe the changes in child eligibility for SSI that took place in the early 1990s and how those changes led substantial numbers of children to switch from AFDC to SSI. Section III outlines the empirical strategy used to estimate the impact of SSI benefit changes on SE enrollment. First stage results are presented in Section IV, and reduced form and instrumental variables estimates are presented in Section V. Section VI concludes.

## **2 Changes in SSI Reciprocity Among Children:**

### **2.1 Eligibility Standards, Recipient Characteristics and AFDC-SSI Caseload Shifting**

When the U.S. government began distributing SSI benefits in 1974, the program covered 1.3 million people, only 5 percent of whom were disabled children.<sup>9</sup> Since then the program has grown to pay benefits to 7.1 million people, over 1 million of whom are disabled children. With nearly 6 percent of children living in a house with some SSI income, it has become a more important source of assistance for children than TANF (Duggan and Kearney, forthcoming).

SSI eligibility criteria and federal payments are applied nationwide, although states can choose to supplement benefits. Family income limits are roughly \$12,000 per year and liquid asset limits are \$2,000 per year for adults applying to SSI, but income and asset limitations for child eligibility are somewhat more lenient. In the determination of child eligibility, a portion

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<sup>9</sup>Information on data sources and variable construction is presented in the Data Appendix.

of parental income is “deemed” to the child. Maximum deemed income depends on the share of parental income that is earned vs. received through public assistance, and the number of children in the household. In 2005, a disabled child in a single-parent household with one other child and monthly earnings of \$1533 could receive the maximum benefit (Duggan and Kearney, forthcoming). Federal benefit levels are generous relative to other cash-assistance programs and, when an individual qualifies for SSI, they are also typically entitled to Medicaid and Food Stamps. The maximum federal benefit in 2005 was about \$580 per month for an individual (SSA 2005). Only 15 states supplement child SSI benefits and these benefits account for just three percent of total SSI spending on children (Duggan and Kearney, forthcoming). The average monthly payment to a child in 2005 was \$517 per month, of which only \$15 was due to supplemental state payments.

## **2.2 Changes in Child SSI Eligibility Standards**

When determining adult SSI eligibility, the Social Security Administration (SSA) first compares the applicant’s condition to a list of disabilities that guarantee qualification. If the condition is not listed, it must be determined whether the applicant’s illness is severe enough to prevent him from working in any job for which he is qualified. Prior to 1990, child eligibility did not include a comparable functional assessment. Rather, if the child’s ailment was not included on the list of disabilities leading to automatic qualification, his application was rejected. In the 1990 *Sullivan v. Zebley* decision, the Supreme Court ruled that holding children to a stricter disability standard than adults was illegal and required the SSA to include an individual functional assessment (IFA) for child applicants as well. For most children, the IFA was determined on the basis of whether the child was capable of functioning in an age-appropriate manner in school.

As part of the settlement in the *Zebley* case, an attempt was made to locate child applicants who were denied SSI benefits, retroactive to 1980. By 1994, nearly 300,000 cases had been re-adjudicated (with 34,000 remaining), 130,000 of which were found eligible for benefits (GAO 1994). These children received a lump sum payment equal to the lost stream of benefits from the time of their initial application. Growth in SSI reciprocity stemming from children in the

retroactive class makes up nearly 30 percent of the total increase in child SSI reciprocity after *Zebley*.

In the late 1980s, Attention Deficit Hyperactivity Disorder (ADHD) and other behavioral/learning disabilities were increasingly diagnosed and treated among children. In the same year as the *Zebley* decision, the SSA added a number of these more mild mental and emotional conditions to the list of eligible disabilities. The SSA also revised its guidelines for the type of evidence that was acceptable in the determination of mental illness, placing less emphasis on medical assessments and relying more on the testimony of parents, counselors and teachers.

All of the changes to the child SSI eligibility criteria that occurred in 1990 led to a dramatic increase in child SSI caseloads.<sup>10</sup> Figures 1a and 1b plot trends in SSI reciprocity levels and rates, respectively, for children under 18 over the past 30 years.<sup>11</sup> The number of children receiving SSI climbed steadily throughout the 1970s and 1980s, but there is a clear abrupt change in 1990. While the number of children on SSI grew from .23 to .26 million between 1985 and 1989, this number grew to nearly one million in 1996. This is an increase in child SSI reciprocity of roughly 260 percent in the six years following *Zebley*.

The escalating caseload and growing controversy over whether children diagnosed with milder mental and emotional disturbances were truly disabled led to a retrenchment in child SSI benefits in the mid-1990s welfare reform laws. Under the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) the SSA was no longer required to apply comparable standards for child and adult SSI applicants (Daly and Burkhauser 2003).<sup>12</sup> The impact of this cutback is clear in Figures 1a and 1b, as child SSI caseloads plateau in 1996, remaining flat for a few years before returning to a slow upward trend.

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<sup>10</sup>Two other changes to the SSI program occurred in the early 1990s that probably had a more modest effect on child SSI participation. First, in 1990 Congress mandated and provided funding for the SSA to expand the scope of its outreach programs. Second, in 1992 the SSA made a minor change to the way parental income is deemed to children, treating unearned income more generously (Hannsgen and Sandell 1996).

<sup>11</sup>Figures reflect SSI reciprocity as of December of each calendar year. The *Zebley* decision occurred in February of 1990.

<sup>12</sup>Although the functional assessment was no longer required, the emotional and mental disabilities added to the SSA's list of qualifying conditions in 1990 were not removed.

The pressure to curtail the growth in child SSI awards prior to the 1996 legislation is apparent in Figures 2a and 2b, which plot trends in SSI applications and awards for children. Prior to *Zebley*, child SSI applications remained fairly constant at roughly 75,000 applicants per year, with an acceptance rate slightly under 40 percent. Applications grew by 275 percent between the passage of *Zebley* and the changes to welfare reform, peaking in 1994 at nearly 350,000 applications per year. Awards for children peak in 1993, when they had reached 5 times their pre-*Zebley* level. Acceptance rates were still very high in the early-1990s (reaching 64 percent in 1992) and were probably an important factor in the incentive to apply for one's child to receive SSI.

### **2.3 Changes in SSI Recipient Characteristics**

The growth in child reciprocity after *Zebley* was almost entirely due to an increase in children with mental disabilities. The SSA categorizes these disabilities into mental retardation and "other mental disorders" which includes disorders such as ADHD and behavioral/emotional disturbances. Table 1 presents SSI recipient characteristics by age group in the years before and after *Zebley* and welfare reform. Between 1989 and 1996, the share of SSI recipients under age 17 grew from 6 to 14 percent, while the share of elderly recipients over age 64 declined from 44 to 32 percent.<sup>13</sup> In 1989, mental retardation was the most common child disability, with 42 percent of children on SSI for this disorder, while only 7 percent of children had a different mental disorder. Between 1989 and 1996, the fraction of children with mental retardation dropped to 37 percent, while the fraction with a mental disorder other than mental retardation grew to 24 percent. By 2002, a larger share of children on SSI had these mental disabilities (37 percent) than mental retardation (35 percent). Since a number of mental and emotional disabilities were added to the SSA's list of qualifying conditions in the early 1990s, it is not surprising that the share of adults with these conditions increased as well. The fact that mental and emotional disabilities are more common among males than females is reflected in the increasing share of boys and men

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<sup>13</sup>One would ideally like to analyze changes in the number of SSI recipients by age and disability, rather than the share, but these figures are not available for child SSI recipients in earlier years.

on SSI.

## 2.4 Incentives to Switch to SSI from AFDC

The liberalization of child disability standards, coupled with a high acceptance rate and generous benefits, provided a strong incentive for parents to seek SSI benefits for their child. Kubik (1999) illustrates that the incentive to apply for SSI is strongly correlated with the amount of benefits a family on AFDC could gain. Income and asset limits are similar for these two programs and the rate of disability among the AFDC population is substantial (Acs and Loprest 1999). AFDC families were made aware of the potential benefit of enrolling one or more family members in SSI by state welfare agencies that could save money by shifting caseloads to the entirely federally-funded SSI program. Schmidt and Sevak (2004) show that states that engaged in welfare reform more aggressively had larger increases in SSI. Kubik (2003) shows that SSI growth within a state is correlated with unexpected expenditure and deficit shocks

Since a child cannot receive both AFDC and SSI benefits, but a family can, it is possible to gain financially by taking a child out of the AFDC family that is used to calculate benefits and enroll him in SSI. That is, while AFDC benefit levels are lower for a two-person family (a mother and one child) than a three person family, the loss in AFDC benefits may be outweighed by the gain in SSI benefits. Thus the gain to switching a child to SSI is a function of the slope of a state's AFDC benefit schedule with respect to family size. Specifically, the variable *SSIGain* is defined as:

$$SSIGain_{st} = BenefitSSI_t - (AFDCBenefit_{st3} - AFDCBenefit_{st2}) \quad (1)$$

where  $BenefitSSI_t$  is the maximum monthly federal SSI benefit level in year  $t$ ,  $AFDCBenefit_{st3}$  is the maximum monthly AFDC benefit in year  $t$  and state  $s$  for a family of 3 (i.e. a single mother with two children) and  $AFDCBenefit_{st2}$  is defined similarly for a family of 2.<sup>14</sup>

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<sup>14</sup>I ignore the state SSI supplement in this formula since very few states provide them for children living in a household and, among those that do, the level of these benefits was very low (only about 2 percent of the total SSI benefit). In the regression results that follow, whether or not a state provided a supplement will be absorbed

In 1989, the year prior to *Zebley*, the average gain to switching a child to SSI was about \$497 per month (in current dollars), but there was substantial variation in this number across states. Figure 3a plots the *SSIGain* variable against child SSI reciprocity rates in 1989. There is a clear, strongly positive, relationship between the gain to a family of switching a child to SSI and the child SSI reciprocity rate in a state. There is also substantial variation in the *SSIGain* variable, which is just over \$400 per month in California and Connecticut, and nearly \$600 per month in Texas and North Carolina.

The gain to switching a child to SSI in 1989 also appears to be strongly correlated with the increase in child SSI rates after *Zebley*. Figure 3b plots the change in child SSI rates between 1989 and 1996 against the *SSIGain* variable in 1989. States in which *SSIGain* was highest experienced increases in child SSI of more than 2 percentage points, whereas this increase was .5 percentage points in the lowest *SSIGain* states.

As shown in Table 1, nearly all of this increase in child SSI enrollment stemmed from the increasing diagnosis of learning disabilities and emotional disorders. These types of conditions are notoriously vague and difficult to define. The rapidly increasing number of children on SSI for these types of disabilities led to some speculation in the press that parents were fabricating their child's illness in order to receive SSI benefits (Kubik 1999). It is difficult to analyze the validity of these claims and I do not attempt to do so here. For the purposes of this paper, it is sufficient that the liberalization of child SSI disability criteria led to an increase in the demand for SSI benefits, which implies an increase in the demand for disability screenings among children.

### 3 Empirical Strategy

We would like to know how SE enrollment changes with the supply of SSI benefits. Using SSI reciprocity as a proxy for SSI benefit supply, the equation of interest is:

$$\ln(SE)_{st} = \beta \cdot \ln(SSI)_{st} + \gamma \cdot X_{st} + \sigma_s + \tau_t + \varepsilon_{st} \quad (2)$$

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by state fixed effects.

where  $SE$  is the number of children enrolled in Special Education and  $SSI$  is the number of children receiving SSI in state  $s$  and year  $t$ . All of these variables include only children under age 18.<sup>15</sup> State and year fixed effects are given by  $\sigma_s$  and  $\tau_t$ , respectively,  $X_{st}$  is a vector of state and time-varying controls and includes an intercept, and  $\varepsilon_{st}$  is a random error term. The regression is specified in natural logarithms because states in which the gain to SSI was largest had both higher initial levels of SSI and larger growth in SSI post-*Zebley*. In an OLS regression of Equation (2),  $\beta$  will be a biased estimate of the impact of SSI benefit expansion on SE enrollment if changes in the supply of SSI benefits are correlated with state-level changes in the demand for benefits (e.g. due to changes in the health and poverty of the child population).<sup>16</sup>

In order to estimate the direct impact of changes in SSI benefit generosity on SE enrollment, I employ an instrumental variables strategy that exploits the interaction between two sources of variation. First is the change in SSI eligibility criteria following *Zebley*, which induced an increase in child SSI reciprocity of more than 250 percent. Since child SSI awards peaked in 1993 (Figure 2a) I consider the period of post-*Zebley* benefit expansion to be 1990 to 1993 and use 1986 to 1989 to estimate the pre-*Zebley* relationship between SSI and SE. If demand for SE placement is responsive to increases in SSI benefit supply, then SE enrollment should increase after *Zebley*. It is unlikely, however, that the increase in SE enrollment after 1990 can be entirely attributed to changes in SSI. For example, it is likely that the *Zebley* decision was partly the result of the increasing diagnosis of mental and emotional disabilities, which would independently lead to a rise in SE enrollment over this period. In order to minimize these confounding factors, I exploit cross-state differences in the financial gain to switching a child from AFDC to SSI. The basic first stage regression for this IV strategy is:

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<sup>15</sup>The SE variable includes children ages 6 – 17, since eligibility for 3 – 5 year olds changed significantly over this period. SSI reciprocity is not broken down to finer age categories than 0 – 17, but the SSI applications variable that I use below is for 6 – 17 year olds. I find no difference between the first stage coefficients using SSI applications or SSI awards for 6 – 17 and for 0 – 17 year olds, so it is unlikely that the impact of the benefit expansion on SSI reciprocity is different for these two groups.

<sup>16</sup>While SSI is a federal program, states agencies are responsible for the disability determination and have some discretion over these decisions for disabilities with relatively broad guidelines. States experiencing negative fiscal shocks might exert pressure over these agencies to move more cases from AFDC/TANF to SSI (Kubik 2003).

$$\ln(SSI)_{st} = \pi \cdot (SSIGain_{st} \cdot POST_t) + \gamma_2 \cdot X_{st} + \sigma_s + \tau_t + \nu_{st} \quad (3)$$

where *SSIGain* is defined in Equation (1) and is equal to the difference between the federal SSI benefit level and the loss to family's AFDC benefits from moving from a three- to a two-person household. The *POST* variable is a dummy variable equal to one after 1989. In this specification, a positive and significant estimate of  $\pi$  implies that the increase in child SSI reciprocity was higher in states with larger gains to switching a child from AFDC to SSI. The vector  $X_{st}$  includes covariates likely to influence both SSI and SE take-up rates, such as the size of the child population, unemployment, poverty and school enrollment rates. In some specifications, I include the level of maximum AFDC benefits for a family of three in the vector  $X_{st}$ . In these specifications the financial incentive to switching a child to SSI from AFDC is identified only off of the slope of the AFDC benefit schedule with respect to family size. Controlling for the level of AFDC benefits is important if, for example, families are more responsive to the gain to SSI when the level of AFDC benefits is low. I show below that  $\pi$  is not significantly affected by the inclusion of any of these covariates.

In order for Equation (3) to yield an unbiased estimate of the impact of financial incentives on SSI enrollment, it must be the case that the acceptance rate for SSI applications is not correlated with the *SSIGain* variable. If, for example, states with higher levels of AFDC payments (i.e. states in which the gain to switching to SSI is lower) try to encourage SSI enrollment with higher acceptance rates, then  $\pi$  could be understating the impact of financial incentives on SSI enrollment. I thus also run a version of Equation (3) in which I control for the ratio of child SSI awards to applications in each state and year.

One potential problem with using SSI reciprocity to measure the response to benefit generosity is that it includes the recipients who had applied for SSI prior to *Zebley* and received retroactive benefits. Children in this retroactive class faced different incentives than new applicants. These children were potentially eligible for a lump sum payment that was probably large relative to the cost of re-adjudication and thus had a strong incentive to re-apply regardless of their

state’s AFDC benefit schedule (Garret and Glied 2000). Much of the increase in SSI reciprocity stemming from this retroactive class is therefore likely to be absorbed by the year fixed effects. Because the SSI and AFDC levels that existed when these children originally applied are very highly correlated with those at the time of re-adjudication, the presence of retroactive recipients will cause the first stage estimates to be biased downward.

A measure of the response to SSI benefit generosity that is not influenced by retroactive determinations is child SSI applications. I thus also estimate the first stage specifications with SSI applications as the dependent variable and show below that it yields similar results, yielding comparable estimates of the impact of SSI benefit expansion on SE enrollment.<sup>17</sup>

The impact of financial incentives on demand for SE placement is given by the reduced form equation:

$$\ln(SE)_{st} = \phi \cdot (SSIGain_{st} \cdot POST_t) + \gamma_2 \cdot X_{st} + \sigma_s + \tau_t + \nu_{st} \quad (4)$$

In order for this IV strategy to yield the direct impact of SSI benefit expansion on SE enrollment, it must be the case that SE enrollment is correlated with the gain to switching to SSI only through its impact on SSI enrollment. One plausible threat to this exclusion restriction is that state-specific health shocks lead to changes in SE enrollment and changes in the AFDC benefit schedule. A reasonable specification check then is to estimate Equations (3) and (4) using the gain to switching to SSI in 1989 (the year before *Zebley*). I show below that the results are very similar when the gain to SSI is fixed in 1989, or is allowed to vary by year.

## 4 Impact of SSI Benefit Generosity on Child SSI Recipients and Applications

It is evident from Figure 1 that child SSI enrollment grew rapidly after the changes to eligibility criteria in 1990. Table 2 illustrates that this increase was largest for states in which the gain to

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<sup>17</sup>Ideally, one would like to use application rates for SSI and for SE to measure the response to incentives, but no such measure exists for SE. Perhaps a second best approach would be to use SSI application rates and flows into SE, but this latter measure is not collected by state either.

switching a child from AFDC to SSI was largest. Column (1) presents the coefficient of interest from the basic first stage regression (Equation 3), with standard errors clustered by state in parenthesis. I find a significant coefficient of .0015 on the instrumental variable ( $SSIGain_{st} \cdot POST_t$ ). The mean of the dependent variable is 8.35 (4230 children) and the mean of  $SSIGain$  is \$505. Therefore, these estimates imply that child SSI reciprocity increased by an average of 113 percent (from 4230 to 9000 children) after *Zebley*. This suggests that SSI enrollment is very sensitive to financial incentives, and that variation in AFDC benefit schedules induced significant differences across states in post-*Zebley* SSI growth. Child SSI reciprocity increases by .15 log points for a \$100 increase in the gain to SSI. The gain to SSI in 1990 varied across states from about \$400 to \$600, so these estimates suggest that child SSI reciprocity grew by 35 percent (.3 log points) more in the highest  $SSIGain$  states than in the lowest.

The rest of the results in Table 2 serve as specification checks. Column (2) estimates the same basic specification as Column (1), but uses only the gain to switching to SSI in 1989. The coefficient estimate is .0013, which is slightly lower than, but not statistically significantly different from, the estimate in Column (1). This suggests that, if states with relatively high AFDC payments (i.e. low levels of  $SSIGain$ ) changed their AFDC benefit schedules to encourage SSI enrollment (or had higher application acceptance rates), these changes were not substantial. Controlling for the unemployment rate, poverty rate and school enrollment rate (Column (3)) has basically no impact on the coefficient estimate, suggesting that these results cannot be explained by health and income shock variation across states. The specification in Column (4) controls for the level of the maximum AFDC benefit to a family of three in each state and year. The coefficient estimate from this specification is very close to that in Column (1), suggesting that (after controlling for state fixed effects) it is the slope of the AFDC benefit schedule with respect to family size that influences SSI switching rates. This is encouraging evidence that the exclusion restriction holds, since it is likely that any confounding sources of variation that are omitted from the regression are correlated with the level of AFDC benefits in a state, rather than the slope of its benefit schedule. The coefficient estimate in Column (5) illustrates that the

instrumental variable is unaffected when controlling for the application acceptance rate in each state and year, suggesting that states with lower gains to SSI did not adapt their acceptance rates to encourage more applicants.

The last column in Table 2 presents coefficient estimates from the following version of the basic first stage specification:

$$\ln(SSI)_{st} = \pi \cdot (SSIGain_{st} \cdot POST_t) + \omega \cdot (SSIGain_{st} \cdot d_{1989}) + \gamma_2 \cdot X_{st} + \sigma_s + \tau_t + \nu_{st} \quad (5)$$

where  $d_{1989}$  is a dummy variable equal to one in 1989. In Equation 5,  $\omega$  measures the relationship between the gain to SSI within a state and SSI reciprocity prior to the *Zebley* decision. The purpose of this specification is to check whether the differential impact of *Zebley* on SSI reciprocity in states with higher gains to SSI can be explained by characteristics of these states that existed prior to *Zebley*. The coefficient estimate on  $(SSIGain_{st} \cdot d_{1989})$  is small but significant, indicating a smaller positive relationship between benefit generosity and reciprocity in the period prior to *Zebley*. The coefficient on  $(SSIGain_{st} \cdot POST_t)$  is unchanged in this specification, suggesting that the estimated impact of *Zebley* on states with higher gains to SSI cannot be explained by pre-existing state characteristics.

Table 3 estimates the same basic first stage specifications as Table 2, with the natural logarithm of child SSI applications as the dependent variable. The coefficient estimate from the most basic specification (Column 1), is positive and significant at .0017. As anticipated, the granting of retroactive awards caused the first stage estimates using SSI reciprocity to be biased downward, although the bias is modest at .002 log points. At the mean level of applications and *SSIGain*, this implies that annual child SSI applications increased by 132 percent (from 1224 to 2842 awards per year) after *Zebley* and that applications increased by 75 percent more in the highest *SSIGain* states than in the lowest.

The other columns in Table 3 are the same specification checks as in Table 2, and yield similar results for SSI applications as they did for recipients. It is not surprising that the impact

of SSI benefits on child applications is more influenced by the inclusion of covariates related to poverty and unemployment than child reciprocity (Column 3). This suggests that applications are more responsive to SSI benefits when poverty and unemployment are high. Otherwise, the coefficient of interest is largely unchanged across specifications, and the relationship between *SSIGain* and child applications in the period before *Zebley* (Column (5)) is very small and insignificant. Figures 4 and 5 plot coefficient estimates from a flexible form of Equation (3) with a full set of year dummies interacted with *SSIGain* (the omitted category is  $(SSIGain_{st} \cdot d_{1986})$ ). Coefficient estimates plotted in these figures, along with standard errors and p-values on an F-test of joint significance are presented in Table 4. Prior to *Zebley*, coefficient estimates are small, but indicate that SSI applications and reciprocity was higher in states with larger gains to SSI. Before 1990, there is no clear trend in the impact of *SSIGain* on demand for SSI, as coefficient estimates are rising slightly for reciprocity and falling slightly for applications. In both cases, the impact of *SSIGain* begins to grow in 1990, and the coefficient estimates become larger and more significant.

## 5 Impact of SSI Benefit Generosity on Special Education Enrollment

### 5.1 Reduced Form Impact of Benefit Generosity on SE Enrollment

The reduced form estimates of SSI benefit expansion on SE enrollment are presented in Table 5. They are estimated from variations of Equation (4). These estimates indicate a large increase in demand for SE services in response to the increase in financial incentives. Column (1) presents the coefficient on  $(SSIGain_{st} \cdot POST)$  in the most basic specification. I estimate a positive and significant coefficient of .0003. Given a mean in the dependent variable of 10.8 (roughly 49,000 children) and a mean value of *SSIGain* of \$500, this estimate implies that the average state saw a post-*Zebley* increase in SE enrollment of 15 percent (an increase of roughly 7500 children). While the *Zebley* decision led to a substantial increase in SE enrollment, variation in the level of incentives had an important impact on cross-state differences in SE growth. These estimates

imply that the highest *SSIGain* states saw post-*Zebley* increases in SE of 18.5 percent, while the states with the lowest incentives had increases closer to 12 percent. These reduced form estimates imply that SE enrollment is responsive to changes in financial incentives, increasing by 0.26 percentage points for every \$100 increase in the gain to SSI.

The reduced form estimates are very stable across specifications (Columns (2) – (5)). This is encouraging evidence that it was the higher gain to enrolling in SSI, and not some other factor correlated with this financial incentive, that induced larger increases in SE enrollment after *Zebley*. The pattern evident in Figure 6, which plots the reduced form coefficients on the yearly interactions with *SSIGain*, is also supportive of the exclusion restriction. The coefficients (presented in Table 4, Column (3)) are tiny and insignificant prior to *Zebley* and become increasingly large and significant after 1989. This figure clearly suggests that variation in SE enrollment captured by the instrumental variable follows the pattern of changes to child SSI reciprocity and applications (Figures 4 and 5).

## 5.2 OLS and IV Estimates of the Relationship between SSI and SE

Table 6 presents OLS and IV estimates of the relationship between SSI reciprocity and SE enrollment. The OLS estimates in the first three columns of Panel A indicate that states with higher rates of children applying for SSI also have significantly higher rates of SE enrollment. However, once state and year fixed effects are controlled for (Columns (4) – (6)), the OLS relationship between SSI and SE is small and insignificant. Coefficient estimates in Panel B use *SSIGain\*POST* as an instrument for SSI reciprocity and are remarkably stable across specifications. These IV estimates imply that a 100 percent increase in SSI reciprocity leads to a 12 to 18 percent increase in SE enrollment. Given the result that the average state saw a post-*Zebley* increase in SSI reciprocity of 113 percent, and taking the average IV coefficient estimate of about .14, these estimates imply that the SSI benefit expansion led to an increase in SE enrollment of roughly 15 percent. This is the same predicted increase in SE that was found using the reduced form estimates. If the SSI benefit expansion led children to enroll in SE who did not eventually apply for or receive SSI benefits, then the reduced form estimates would be capturing aspects

of the incentive effect on SE that the IV estimates would not. The fact that the reduced form and IV coefficients predict the same increase in SE enrollment is encouraging evidence that the IV estimates are capturing the true relationship between SSI and SE.

While the financial incentives brought on by the *Zebley* decision led to a substantial increase in SE enrollment, I do not find that cross-state variation in SSI can explain much of the observed variation in SE enrollment. Taking the IV coefficient estimate in Column (2) (which does not include state fixed effects), and using an observed variance of 1.25 and 1 in the natural logarithm of SSI reciprocity and SE enrollment respectively (in 1993), these estimates suggest that roughly 1.5 percent of the cross-state variation in SE can be explained by variation in child SSI enrollment.

## 6 Conclusion

With 14 percent of public school students in Special Education and expenditures growing to accommodate these students, attention has been increasingly focused on how schools use SE placement to respond to fiscal incentives and accountability standards. Relatively little attention has been given, however, to how families respond to incentives for SE placement. This paper is the first to explore how parents respond to fiscal incentives to have a child screened for a disability. I find that the cash benefits a disabled child can receive from the federal SSI program provide a strong incentive for parents to have their child screened for SE placement. While these results speak to the responsiveness to financial incentives for SE placement, future research focusing on how parents respond to other incentives, such as class size and SE program quality, may help to explain large cross-sectional differences in SE enrollment. More broadly, these results suggest that reforms to entitlement programs that make eligibility conditional on child health should consider spillovers into Special Education programs.

## **7 Data Appendix**

### **7.1 Special Education Enrollment**

Annual, state-level data on Special Education enrollment by age group and disability category are published in the Office of Special Education Programs Annual Report to Congress on the Implementation of the Individuals with Disabilities Act (IDEA) series. Data for children over age 3 is published in the data tables for IDEA Part B enrollment. Compiled data was generously provided by Westat.

### **7.2 Supplemental Security Income (SSI) Recipients, Applicants, Recipient Characteristics and Benefit Levels**

Annual, state-level data on the number of SSI recipients under age 18 are taken from various years of the Social Security Administration's Annual Statistical Supplement. This variable contains all blind and disabled children receiving federally-administered SSI as of December of each calendar year. Characteristics of SSI recipients by age group reported in Table 1 are taken from the same publication. Annual, state-level data on the number of SSI applicants by age group (0-17, 18-64 and 65+) was generously provided by Clark Pickett of the Social Security Administration. Federal SSI benefit levels are the maximum federal benefit as reported in various years of the Social Security Administration Annual Statistical Supplement. Benefit levels are adjusted to 2003 dollars using the Consumer Price Index for All Urban Consumers.

### **7.3 Aid to Families with Dependent Children (AFDC) Benefit Levels**

Annual, state-level AFDC benefits are taken from various years of the Ways and Means Committee Overview of Entitlement Programs (Green Book). Maximum benefit levels for a family of three (single mother with two children) and a family of two (single mother with one child) are adjusted to 2007 dollars using the Consumer Price Index for All Urban Consumers.

## 7.4 School Enrollment

Annual, state-level total school enrollment data is taken from various years of the Office of Special Education Programs Annual Report to Congress on the Implementation of the Individuals with Disabilities Act (IDEA) series. This data is not broken down by age group.

## 7.5 Poverty and Unemployment Rates

Annual, state-level data on the number and percentage of people living in poverty is taken from the U.S. Census Bureau's Historical Poverty Tables, available at <http://www.census.gov/hhes/www/poverty/hist>. Monthly, state-level unemployment rates (seasonally-adjusted) are taken from the Bureau of Labor Statistics Local Area Unemployment Statistics and are averaged to construct an annual state-level unemployment rate.

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