

This chapter contributes to the literature by studying the impact of disability on personal earnings, family income, receipt of public benefits, and poverty using data collected over a thirty-eight-year period from the Panel Study of Income Dynamics (PSID). The longitudinal structure of these data allows us to examine changes in the variables of interest before and after individuals become disabled. To analyze these outcomes, we must rely on a self-reported measure of disability. We argue that self-reports are the only feasible option, given that a large proportion of disabilities, even those compensated by SSDI, cannot be determined by an explicit physical marker (because they are psychological or involve pain).⁸ In addition, program-based definitions miss nonrecipients and nonreporting recipients. Several studies also indicate that self-reported disability has many desirable features (Stern 1989; Benitez-Silva et al. 2004), although this view is not universally held. Although we follow the methodology of Meyer and Mok (2012), the present study differs in its focus on changes in income, in particular public-benefit receipt. We show that the onset of disability is associated with a significant reduction in an individual's earnings and income and a significant increase in poverty. That is coupled with the receipt of public transfers for a large group of individuals, many of whom have insufficient assets to cushion the shock. We find that these effects vary substantially depending on the extent of an individual's disability.

The remainder of this chapter proceeds as follows. The next section describes our data set and sample, how we define and categorize the disabled, and the empirical strategy used. The following section examines changes in earnings, income, poverty, and receipt of public transfers following disability onset.

DATA AND METHOD

Data

Our data are from the 1968–2005 waves of the PSID.⁹ We focus on male household heads twenty-two to sixty-one years of age in the survey year; those under age twenty-two are unlikely to be household heads.^{10,11} The PSID defines the household head in a married-couple family to be the male, except when the household head is so severely disabled that he is unable to respond to the survey, which is rare. To insure sufficient

CHAPTER THIRTEEN

The Economic Consequences of Disability

Evidence from the PSID

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INTRODUCTION

Disability is one of the main risks individuals face in their lifetimes, and it has become a significant concern among policymakers in many countries. The U.S. Social Security Administration (SSA) estimates that a twenty-year-old worker has nearly a 30 percent chance of becoming disabled before reaching age sixty-five.^{1,2} Census of Population data for 2000 indicate that 20.9 million families (28.9 percent of all American families) have at least one disabled member, and 12.8 percent of these families live in poverty; the corresponding poverty rate for families without disabled members is only 7.7 percent.³ This chapter examines the consequences of disability on a wide range of household economic outcomes.

Public insurance spending on the disabled has increased significantly. In 2009, Social Security Disability Insurance (SSDI) payments amounted to \$118 billion, and Supplementary Security Income (SSI) for the blind and the disabled reached \$41 billion.⁴ Private spending on the disabled was also substantial, with \$57.6 billion spent on workers' compensation in 2008.⁵ These expenditures are high even compared to such social insurance or welfare programs as unemployment insurance (\$80 billion in 2009) and food stamps (\$50 billion in fiscal year 2009).⁶ Autor and Duggan (2006) predict that the SSDI receipt rate will rise 71 percent before reaching a steady state rate of approximately 7 percent of nonelderly adults. Despite the high disability rates and program costs, few studies examine the long-term economic circumstances of the disabled.⁷

information on the variables of interest, we selected male household heads who were interviewed for at least six years and who were between twenty-two and sixty-one years old for at least four interviews, three of which were consecutive. To identify the disabled, we use the response to the disability question in the PSID: *Do you have any physical or nervous condition that limits the type or amount of work you can do?* This question is asked of household heads consistently throughout the life of the survey.¹² We divide our sample of male household heads into disabled and nondisabled individuals. The nondisabled sample consists of those who never reported that they had a physical or nervous limitation during the survey years. Members of the disabled sample must have reported a limitation in at least one year. Given we are mostly interested in the effects of working age disability, we also delete those who became disabled after the age of 56.

We replace missing demographic information (age, marital status, years of education, number of family members, number of children, and state of residence) by the nonmissing value in the nearest wave.¹³ We exclude, however, individuals who are missing key demographic variables (education, age, and marital status).¹⁴ The application of these restrictions results in a primary sample of 6,301 male household heads, 1,819 (29 percent) of whom are classified as ever disabled.

Disability Questions, Limitations, and Severity

We are interested in how the degree of disability affects economic outcomes, and we therefore follow the disaggregation strategy adopted by Meyer and Mok (2012), by grouping the disabled along persistence and severity dimensions. The three persistence groups are: *One-Time Disabled*—those who report a disability once, but do not report a disability again during the next ten years; the *Temporarily Disabled*—those who have one or two positive limitation reports within the ten years following disability onset; and the *Chronically Disabled*—those who have three or more positive limitation reports over the ten years following disability onset. To reduce the dependence of definitions on the number of years a household head participates in the survey, we use all the survey waves and require that a disabled individual be in the survey for at least three years within the ten years following onset.¹⁵

After establishing the presence of a work-limiting condition, a severity question addresses the extent to which this condition limits the work capability of the household head. We group responses to this question into two categories: *Severely Disabled* and *Not Severely Disabled*. We define *Not Severely Disabled in Year t* as individuals who respond “just a little,” “Somewhat,” “Not limiting,” or “Not at all” to the severity question in the year *t* survey. *Severely Disabled in Year t* are those who respond “Can do nothing,” “Completely,” “A lot,” or “Severely.” We define the *severity ratio* as the proportion of time the individual reports being severely disabled in the year of onset and the ten years following onset.¹⁶ We define the *Severely Disabled* as individuals whose severity ratio is greater than 0.5. That is, starting from year of onset to the tenth year following onset, more than 50 percent of the observed severity reports consist of the following responses: “Can do nothing,” “Completely,” “A lot,” or “Severely.” The *Not Severely Disabled* are those individuals whose severity ratio is less than 0.5. When exactly half the responses indicate severe disability (that is, a severity ratio of 0.5), we classify the disabled individual based on the first observed severity report.¹⁷

We combine the two disability dimensions in our main analysis by splitting the Chronically Disabled into two groups. The *Chronic-Not Severe* are chronically but not severely disabled under the severity classification. The *Chronic-Severe* are chronically and severely disabled. Hence, this classification yields four groups of interest: *One-time, Temporary, Chronic-Not Severe*, and *Chronic-Severe*—collectively, the *Extent of Disability* groups.¹⁸

The use of these self-reported disability responses is controversial, but past researchers have also pointed out the merits of self-reported disability measures. Benitez-Silva et al. (2004) suggest that self-reported disability responses are an unbiased indicator of SSDI eligibility decisions. Stern (1989) finds that a self-reported disability question is close to exogenous. To the extent that self-reported disability is endogenous, the relationship is opposite to what is hypothesized in the literature (i.e., health tends to deteriorate when working rather than disability being used to justify not working). In their comparison of the Current Population Survey (CPS) and the National Health Interview Survey (NHIS),

Burkhauser et al. (2002) argue that the self-reported work-limitation-based definition of disability may even underestimate disability rates. Given that alternative definitions have their own endogeneity problems or are often too narrow, we believe that self-reported disability status responses, while not perfect, offer the best available method of measurement.¹⁹

Our sample consists of 6,301 individuals, 1,819 of whom have had a disability. Of these disabled individuals, 418 (23 percent) are One-Time Disabled; 555 (31 percent) are Temporary Disabled, 531 (29 percent) are Chronic-Not Severe; and 315 (17 percent) are Chronic-Severe. Meyer and Mok (2012) provide a more comprehensive overview of the characteristics of the sample. The average age at disability onset is highest for the Chronic-Severe group (41.6 years), followed in descending order by the Chronic-Not Severe group (36.7 years); the Temporary group (35.2 years); and the One-Time group (35 years). The Chronic-Severe group is also the least-educated group—only 18 percent have ever attended college; by comparison, 46 percent of the One-Time group have attended college.²⁰

Members of the Chronic-Severe group have more persistent disabilities on average than the Chronic-Not Severe group. The Chronic-Severe group reports a mean of 6.3 positive limitation reports within ten years after disability onset, while the Chronic-Not Severe group reports a mean of 5.4. The average severity ratio of the Chronic-Severe group at 0.84 is more than six times that of the Chronic-Not Severe group rate of 0.12. Meyer and Mok (2012) report that by the time a male household head reaches age fifty, there is an 11 percent chance that he has begun a Chronic-Severe disability. Thus, we emphasize that the Chronic-Severe group represents a substantial share of working-age household heads.

Estimation Technique

To measure the change in economic outcomes before and after the onset of disability, we estimate the following fixed-effect linear regression model for person i in year t :

$$(1) \quad y_{it} = \alpha_i + \gamma_t + X_{it}\beta + \sum_g \delta_{it}^g S_{it}^g + \varepsilon_{it},$$

where y_{it} is the outcome of interest (such as labor earnings) for person i in year t , α_i is an indicator variable for individual i and γ_t is an indica-

tor variable for year t . X_{it} is a set of time-varying explanatory variables including marital status, state of residence, age and age-squared, education, and number of children. Additional controls are included, depending on the dependent variable.²¹ S_{it}^g is an indicator variable that equals one if in year t , individual i belongs to disability group g and is in time period k (defined below), and ε_{it} is a potentially serially correlated error term. Four different time periods ($k = \{1, 2, 3, 4\}$) are of interest:

Before onset ($k = 1$): $-5 \leq j \leq -2$

Around onset ($k = 2$): $-1 \leq j \leq 1$

Short run ($k = 3$): $2 \leq j \leq 5$

Long run ($k = 4$): $6 \leq j \leq 10$,

where j is year from disability onset, with $j = 0$ being the year of onset.

Our sample consists of the nondisabled and the disabled during all years prior to disability onset through the ten years following onset. Given the inclusion of individual fixed effects, δ_{it}^g measures the change in the dependent variable for individuals in disability group g in time period k , relative to the value of their dependent variable more than five years prior to disability. Because we include control variables such as age, age-squared, and year, the coefficients can also be taken to measure the change in the outcome relative to what would have happened if not for the disability. The nondisabled are included to improve the precision of the estimated effects of age, education, and the other control variables. This way of modeling the time pattern of economic outcomes is similar to the approach of Jacobson, LaLonde, and Sullivan (1993); Stephens (2001); and Charles (2003).²²

CHANGES IN EARNINGS, AFTER-TAX INCOME,
AND PUBLIC TRANSFERS, BEFORE AND AFTER
DISABILITY ONSET

Earnings of Head

Section A of Table 13.1 shows the changes in earnings from estimating Equation (1) when we first treat the disabled sample as a single group and, second, when the disabled are disaggregated. For each group, we report the estimated dollar change, followed by its standard error and the implied percentage change beneath. The denominators of the percentage

TABLE 13.1
Changes in earnings and after-tax income including noncash benefits
before and after disability onset

	EXTENT OF DISABILITY GROUPS			
	All disabled	One-time	Temporary	Chronic-not severe Chronic-severe
A. EARNINGS (DOLLARS)				
Before onset	-2,888 (871)**	-2,500 (1,168)*	-1,552 (1,434)	-4,336 (1,656)**
Around onset	-7,399 -6,363 (1,175)**	-5,922 -4,613 (1,478)**	-4,133 -3,679 (2,157)	-10,533 -7,318 (1,886)**
Short run	-21.81% -7.29% -8,944 (1,527)**	-11.50% -10.70% -5,406 (1,996)**	-9.67% -9.084 (2,985)	-17.73% -24,673 (2,069)**
Long run	-9.878 (1,863)**	-5.477 (2,244)*	-7.83% (3,472)	-23.78% (2,542)**
	-23.04%	-10.80%	-5.62%	-26.79%
B. AFTER-TAX INCOME INCLUDING NONCASH BENEFITS (DOLLARS)				
Before onset	-1,996 (815)*	-1,592 (1,148)	-530 (1,390)	-1,796 (1,523)
Around onset	-3,656 (1,092)**	-4,368 (1,840)	-1,527 (1,874)	-2,573 (1,798)**
Short run	-7.17% -5.094 (1,385)**	-7.89% -4,420 (1,834)*	-3.05% -2,565 (2,425)	-5.13% -3,733 (2,243)
Long run	-6.162 (1,761)**	-4,203 (2,616)	-4.92% (2,919)	-7.01% (2,657)*
	-10.62%	-6.14%	-4.02%	-10.07%

NOTES: The estimates reported are the coefficient estimates on the time from onset indicator variables interacted with the extent of disability groups in a fixed-effect regression (see equation (1) in text). The omitted period is more than five years before disability onset. Standard errors clustered by person are in parentheses with implied percentage changes reported beneath. The statistical significance of each estimate is indicated as follows: *Significant at 5 percent level, **Significant at 1 percent level; dollars are CPI-U adjusted 2005 dollars.

changes are obtained from the average of the predicted earnings of members of the disabled groups as if disability had not occurred (setting all the time from onset indicators to zero). Earnings are estimated to decline by 7 percent in the before-onset period, as well as in the period around onset. In the short run following disability onset, we expect the disabled to suffer from a 22 percent decline in earnings. In the long run, earnings drop by 23 percent. Our results are similar to those of Stephens (2001),

and show little evidence of a recovery in earnings among the average disabled over the course of a disability.

When the disabled are disaggregated, the results show pronounced heterogeneity in the earnings changes across the disability groups. For the One-Time group, earnings are expected to drop by 10.7 percent around the onset period. Earnings further drop by 11.5 percent in the short run after disability, but this drop stabilizes and remains at 10.8 percent in the long run. For the Temporary group, the drop in earnings around onset is about 9.7 percent, but earnings do recover over time, as suggested by the smaller and statistically insignificant estimates for both the short run and the long run. However, the drop in earnings is large for the Chronic-Not Severe and the Chronic-Severe groups. For the Chronic-Not Severe, earnings are estimated to drop by 17.7 percent around onset, by 23.8 percent in the short run, and by 26.8 percent in the long run. For the Chronic-Severe, the drop in earnings is even larger, amounting to 39.5 percent around onset, 68 percent in the short run, and 78.5 percent in the long run. These declines for the most disabled are often more than twice as large as those of the Chronic-Not Severe group, and they are about three times as large as those of the average disabled. Meyer and Mok (2012) show that the pronounced drop for the Chronic-Severe disabled is due to the high proportion who work zero hours following disability—by the tenth year after disability onset, about 65 percent of the Chronic-Severe group have zero hours of work.

After-Tax Family Income

The large drop in earnings observed above, especially for the Chronic-Severe group, may not translate into a large reduction in family economic well-being because of the presence of nonlabor income, intrafamily risk sharing through earnings of a spouse or children, interfamily transfers such as support from friends and relatives, and reductions in taxes or increases in tax credits from programs such as the Earned Income Tax Credit that supplement income for the working poor.

Using the summary family income variable provided by the PSID, which is the sum of labor, assets, and transfer income, may be unsatisfactory even after accounting for federal income tax liabilities.²³ First, this measure does not include in-kind transfers such as food stamps and

subsidized housing. Second, public transfer income is generally underreported in household surveys, and transfers to the disabled in the PSID are no exception.²⁴ We follow Meyer and Mok (2012) and obtain income figures by summing up after-tax family income, food stamps, and any housing subsidy received.²⁵ In addition, we account for underreporting in the main public benefit programs by scaling the benefits received using the program-specific reporting rates as reported in Meyer, Mok, and Sullivan (2009). These reporting rates are calculated by comparing the weighted sum of the benefits received by the entire PSID sample with those reported to have been paid out by government agencies. By scaling up benefits in this way, we implicitly assume that nonreporting recipients share the same characteristics as reporting recipients.

Section B of Table 13.1 shows the estimated changes in after-tax income for the average disabled and each of the disability groups. The denominators used for the percentage changes again are calculated as the average of the predicted income of the disability groups with the time from onset dummies set to zero. These percentage changes are reported below the standard errors, which are in turn below the coefficient estimates. For the average disabled, the long-run drop in after-tax income is approximately 10.6 percent. However, disaggregating reveals a very different picture. For the One-Time and Temporary disability groups, the estimated drop in after-tax income in the long run is small (6.1 percent and 4.0 percent, respectively) and imprecisely measured. For the Chronic-Severe group, however, the decline is large, amounting to almost 18.4 percent around onset, increasing to 28.1 percent in the short run, and 34.5 percent in the long run. This large drop in the long run is much smaller than the large drop in earnings observed earlier.

Public Transfers

We next investigate the role of public transfers in alleviating the decline in material well-being of the disabled head and family. Section A of Table 13.2 shows the change in public transfers to the family across disability groups. The Chronic-Severe group receives by far the largest public transfers; total benefits increase by \$5,700 around onset and are estimated to double in the long run. Given the large drop in earnings we observe above, the smaller reduction in income than earnings is largely due to the receipt of public transfers.

TABLE 13.2

Public transfers receipt before and after disability onset

	EXTENT OF DISABILITY GROUPS			
	All disabled	One-time	Temporary	Chronic-not severe Chronic-severe
A. ALL PUBLIC TRANSFERS (DOLLARS)				
Before onset	209 (136)	391 (281)	220 (225)	235 (286)
Around onset	2,167 (232)**	919 (291)**	1,710 (320)**	2,185 (420)**
Short run	2,869 (265)**	503 (279)	1,310 (343)**	2,775 (510)**
Long run	2,757 (284)**	450 (406)	1,046 (310)**	2,338 (445)**
B. SOCIAL SECURITY RETIREMENT AND DISABILITY				
Before onset	0.029	0.029	0.025	0.026
Around onset	0.051	0.026	0.041	0.045
Short run	0.104	0.035	0.049	0.063
Long run	0.138	0.034	0.053	0.104
C. SSI				
Before onset	0.007	0.002	0.011	0.009
Around onset	0.015	0.005	0.014	0.010
Short run	0.023	0.006	0.015	0.014
Long run	0.025	0.009	0.014	0.015
D. FOOD STAMPS				
Before onset	0.078	0.070	0.080	0.078
Around onset	0.119	0.088	0.120	0.116
Short run	0.124	0.061	0.120	0.117
Long run	0.111	0.051	0.088	0.108
E. OTHER PUBLIC BENEFITS				
Before onset	0.146	0.144	0.153	0.131
Around onset	0.190	0.163	0.188	0.208
Short run	0.160	0.133	0.160	0.170
Long run	0.131	0.096	0.131	0.151
F. POVERTY RATE BEFORE PUBLIC TRANSFERS				
Before onset	0.124	0.091	0.114	0.120
Around onset	0.180	0.113	0.166	0.165
Short run	0.215	0.083	0.180	0.178
Long run	0.204	0.088	0.109	0.168
G. POVERTY RATE AFTER PUBLIC TRANSFERS				
Before onset	0.090	0.056	0.081	0.092
Around onset	0.116	0.073	0.121	0.100
Short run	0.128	0.055	0.131	0.109
Long run	0.116	0.067	0.076	0.123

NOTES: In Panel A the estimates reported are the coefficient estimates on the time from onset indicator variables interacted with the extent of disability groups in a fixed effect regression (see equation (1) in text) with the total amount of public transfers received as the dependent variable. The omitted period is more than five years before onset. Standard errors clustered by person are in parentheses. The statistical significance of each estimate is indicated as follows: * Significant at 5 percent level, ** Significant at 1 percent level. Panels B through E report the fraction of families receiving a given benefit. Dollars are CPI-U adjusted 2005 dollars. For Panels F and G, the numbers reported are the fraction living below poverty before and after the inclusion of public transfers (underreporting adjusted).

The remainder of Table 13.2 shows the receipt of various public benefits by the different disability groups. We first focus on Social Security retirement and disability benefits. While on average 13.8 percent of the disabled receive Social Security benefits in the long run after disability onset, this is mostly due to the Chronic-Severe group, with about 48 percent of its members receiving such benefits. For SSI, again the Chronic-Severe group has a long-run receipt rate more than three times that of the average disabled. For food stamps, a program mostly targeting the poor, we also see the Chronic-Severe group has a much higher receipt rate than the average disabled in the long run. This result is consistent with the higher poverty rate among the Chronic-Severe group as we shall see below. For other public benefits—unemployment insurance (UI), workers' compensation (WC) and public housing—the receipt rate is similar across the disability groups. This finding is expected, as UI targets the unemployed but actively searching for work, WC benefits are mostly temporary, and public housing is not a program specifically targeting the disabled. We should emphasize that these receipt rates are likely lower than the actual receipt rates given the frequency of underreporting receipt. However, the bottom-line message is clear: The probability of benefit receipt varies substantially across the extent of disability groups, so that an analysis based on the average disabled is misleading.

Poverty.

The goal of any public social insurance program is to alleviate material deprivation that might result from an unexpected bad event. With the high benefit-receipt rates we observe above, a natural question to ask is to what extent these public benefits alleviate poverty. To answer this question, we study the poverty rates of families in the various disability groups across time with and without these public benefits included in their incomes. These estimates are reported in Panels F and G in Table 13.2. For the average disabled before disability onset, the poverty rate is about 12 percent before accounting for public transfers, a number close to the national average. In the long run after disability onset, that number rises to about 20 percent, but is almost halved after public transfers are included. The importance of public transfers is more evident for the Chronic-Severe group. In the long run after disability, almost 60 percent of such families would fall into poverty in the absence of public transfers.

However, the poverty rate falls to 23.1 percent when these public transfers are included. This finding suggests that there may be too few alternative private income sources for the Chronic-Severe disabled given their relatively high poverty rate in the absence of public transfers. However, we should also suspect that the availability of these public transfer programs may "crowd out" other income sources, such as spousal earnings.

Changes Before and After 1980

Given the length of the PSID panel, it is also of interest to see how the recent disabled fare relative to their earlier counterparts. We split the disabled roughly in half, based on the period of disability onset. Estimates are reported in Table 13.3.²⁶ Panel A shows the long-run changes in earnings, after-tax income, public transfers, and receipt of OASDI/SSI for those who started their first observed disability spell on or before 1980. Panel B reports these estimates for those who became disabled after 1980. Although the change in earnings for the average disabled is similar in these two periods, the percentage change differs. The more recent disabled experience a lower percentage decline in earnings in the long run than their older counterparts. In terms of after-tax income (including noncash benefits), the more recent disabled sample also have a lower loss, at about 9 percent compared with about 12 percent of their earlier counterparts. Such findings may lead us to conclude that the economic situation for the disabled has improved over time, but a closer examination of the changes in earnings and income across the disability groups gives us a somewhat different picture. Looking at the most disabled Chronic-Severe group in the most recent period, earnings drop by 82 percent in the long run, which is much greater than the 73 percent drop suffered by their earlier counterparts. The drop in after-tax income is also greater for the more recent Chronic-Severe disabled, while the drop in after-tax income for the Temporary and the Chronic-Not Severe groups is smaller (and not statistically significant at 5 percent). Note that we use the entire time period to classify disabilities, so those with onset in the later period have fewer years after onset, on average, to be classified as chronic, leading to a lower Chronic-Severe prevalence. Another point to note is that the more recent Chronic-Severe disabled receive relatively more public transfers (and more of them receive OASDI/SSI), which partly mitigates the very large drop in earnings. Overall, it is

TABLE 13.3
Long-run changes in earnings, after-tax income, and public transfers,
by year of onset

	EXTENT OF DISABILITY GROUPS			
	All disabled	One-time	Temporary	Chronic-not severe
A. DISABILITY ONSET ON OR BEFORE 1980				
Earnings (\$)	-10,870 (1,687)**	-2,283 (2,579)	-2,732 (2,688)	-9,264 (2,139)**
After-tax income (\$)	-28,57% (1,727)**	-5.30% (4,824)	-6.96% (2,438)	-22.12% (1,955)**
Public transfers (\$)	-5,852 (3,967)	1,248 (4,824)	-4,378 (2,438)	-5,184 (2,892)**
Receipt of OASDI or SSI disabled	-11.83% (608)**	2.27% (507)	-8.82% (528)**	-10.31% (678)**
	0.177	0.101	0.062	0.106
	832	77	256	291
				208
B. DISABILITY ONSET AFTER 1980				
Earnings (\$)	-9,163 (2,307)**	-5,999 (2,566)*	-1,318 (4,506)	-11,911 (3,575)**
After-tax income (\$)	-18.63% (2,243)**	-11.23% (2,951)	-2.84% (3,860)	-24.29% (3,916)
Public transfers (\$)	-6,255 (8,97%)	-5,421 (7.38%)	-1,488 (539)	-6,086 (2,101)
Receipt of OASDI or SSI disabled	2,213 (341)**	357 (486)	539 (337)	-8.93% (563)**
	0.122	0.022	0.066	0.121
	987	341	299	240
				107

NOTES: The first three sets of rows in both panels report the coefficient estimates on the long-run time from onset indicator variable interacted with the extent of disability groups (see equation (1) in text) in a fixed-effect regression. The omitted period is more than five years before onset. Standard errors clustered by person are in parentheses with implied percentage changes reported beneath. The statistical significance of each estimate is indicated as follows: *Significant at 5 percent level, **Significant at 1 percent level. The final row of each panel reports the share of those in each disability group who are OASDI/SSI recipients. Dollars are CPI-U adjusted 2005 dollars.

important to note that the predicament of the most disabled has not been alleviated in more recent years.

Pre-Onset Net Wealth and Changes in After-Tax Income

It is possible that those disabled with a large fall in income have assets upon which they can draw to prevent a drop in living standards. Thus, we next investigate how the income changes differ between high- and

low-wealth disabled. Data on wealth come from the 1984, 1989, 1994, 1999, 2001, 2003, and 2005 waves of the PSID. Because many years are missing asset information, we focus only on those disabled who became disabled in 1984 or later.²⁷ We sort each disabled head into one of two subgroups—those with pre-onset net wealth above and below twice their average annual pre-onset after-tax income (high and low pre-onset net wealth). Table 13.4 reports the changes in after-tax income for these two net wealth groups. We should first note that about half of all disabled and 60 percent of the Chronic-Severe disabled have assets of less than two years' income prior to onset. Among the average disabled with high pre-onset net wealth, the results suggest that the long-run decline in after-tax income is small, as the estimate is statistically insignificant (the point estimate is positive).²⁸ In contrast, those with low pre-onset net wealth suffer from a very large 19 percent decline in after-tax income. Turning to the Chronic-Severe group, the long-run drop in after-tax income is very large—36 percent for the high pre-onset net wealth group. For their low-wealth pre-onset counterparts, the drop is nearly as large, at 32 percent. In most cases, these low net wealth groups suffer from much greater losses in after-tax income than their wealthier counterparts. With less than two years' after-tax income in the form of net wealth, these households seem unlikely to be able to shield themselves from a substantial fall in their living standards by drawing down assets, as these assets would quickly be exhausted. Given the small subsample of disabled heads with wealth information, these results are only suggestive.²⁹ A more definitive examination of the living standards of the disabled will require examining consumption patterns (Meyer and Mok 2012) or material hardship indicators.

DISCUSSION

This chapter investigates how a wide range of economic outcomes change following the onset of disability. Data from the PSID suggest that treating the disabled as a single group in economic analyses may give a distorted picture of changes in well-being. Earnings and income drop significantly over the course of disability, but the drop is felt most profoundly by the most disabled group, which sees its income fall by more than 30 percent and has a poverty rate of more than 23 percent in

TABLE 13.4
Changes in after-tax income including noncash benefits before and after disability onset, by high and low pre-onset net wealth

	EXTENT OF DISABILITY GROUPS			
	All disabled	One-time	Temporary	Chronic-not severe Chronic-severe
A. HIGH PRE-ONSET NET WEALTH (MORE THAN TWO YEARS' INCOME)				
Before onset	2,850 (1,757)	2,048 (2,203)	4,078 (2,946)	4,167 (4,759)
Around onset	4,57% 1,949 (2,427)	3,22% -2,060 (3,184)	6,44% 6,959 (4,038)	6,71% 5,112 (6,196)
Short run	2,98% 1,548 (3,108)	-3,05% -3,819 (3,327)	10,73% 6,453 (5,712)	7,79% 11,134 (8,104)
Long run	2,19% 3,279 (4,453)	-5,26% 1,029 (5,663)	9,46% 9,737 (7,627)	14,64% 6,002 (11,162)
Number of disabled	354	133	126	67
B. LOW PRE-ONSET NET WEALTH (LESS THAN TWO YEARS' INCOME)				
Before onset	-5,422 (921)**	-3,791 (1,450)**	-5,626 (1,528)**	-4,666 (1,724)**
Around onset	-11,57% -8,150 (1,196)**	-8,04% -7,683 (1,963)**	-12,31% -7,989 (2,072)**	-10,04% -7,233 (1,771)**
Short run	-15,37% -10,139 (1,660)**	-13,96% -8,393 (2,144)**	-15,50% -9,348 (3,213)**	-13,93% -10,857 (2,454)**
Long run	-17,03% -12,418 (2,128)**	-13,49% -10,352 (3,122)**	-16,10% -8,613 (4,302)**	-18,34% -13,997 (2,563)**
Number of disabled	341	119	95	85

NOTES: The estimates reported are the coefficient estimates on the time from onset indicator variables interacted with the extent of disability groups in a fixed effect regression (see equation (1) in text with income as the dependent variable. The omitted period is more than five years before disability onset. Standard errors clustered by person are in parentheses with implied percentage changes reported beneath. The statistical significance of each estimate is indicated as follows: *Significant at 5 percent level, **Significant at 1 percent level. Dollars are CPI-U adjusted 2005 dollars.

the long run. We also show that the most disabled group receives much more in public benefits. Despite the receipt of benefits, the situation for this chronic and severely disabled group is dire. As discussed in detail in Meyer and Mok (2012), this most disabled group is large, so its situation should not be overlooked. When we split our time period in two, the fall

in earnings and in after-tax and transfer income is even greater in the most recent years for the chronic and severely disabled. To make matters worse, the fall in household income is even greater for those with little in the way of assets to draw upon. These results call for further examination of the living standard of the disabled, including an analysis of their consumption. The results in this chapter also raise the stakes in the discussion of disability policy, which has tended to focus on the rise in benefit receipt and its disincentive effects. Our results suggest that there is substantial deprivation that existing benefits do not prevent.

NOTES

1. See Baldwin and Chu (2006), who estimate that the probability of receiving Social Security Disability Insurance by age sixty-seven is 38 percent for men and 31 percent for women.
2. A recent report by the Institute of Medicine (2007) concludes that the number of people in the U.S. with disabilities currently exceeds 40 million. This conclusion is based on reviewing a selection of survey results, including results from the National Health Interview Survey, Survey of Income Program Participation, Census of Population, and American Community Survey.
3. See Wang (2005).
4. Specifically, the federal government spent \$38 billion on SSI for the blind and the disabled (age 0-64), while another \$3 billion was spent in federally administered state supplementation (U.S. Social Security Administration 2010).
5. See Sengupta et al. (2010). The reported amount includes payments for medical treatment and cash benefits.
6. For unemployment insurance, see Department of Labor (2011). For food stamps, see U.S. Department of Agriculture, Food and Nutrition Service Program Data (2011).
7. Important work on this topic includes Haveman and Wolfe (1990), who study the difference between the incomes and earnings of the disabled and nondisabled using the Current Population Survey. Bound and Burkhauser (1999) compare earnings of the disabled and the nondisabled. Charles (2003) examines earnings, hours, and wages after disability. Stephens (2001) analyzes several of these outcomes along with food consumption.
8. Autor and Duggan (2006) report that more than half of SSDI awards in 2003 were for either mental disorders or musculoskeletal disorders (e.g., back pain).
9. The PSID is a longitudinal data set started in 1968 with an initial sample of approximately 4,800 U.S. households comprising approximately

18,000 individuals. See Meyer and Mok (2012) for more background information about the survey.

10. We retain data on disability for people outside this age range because they may prove useful in determining the persistence or severity of an individual's disabling condition. As we explain later, the degree of persistence is determined based on the frequency of positive limitation reports after disability onset. Thus, ignoring information after age sixty-one may lead to an individual being misclassified, especially if his or her age of disability onset is close to sixty-one. Similarly, the age of onset cannot be correctly determined if we exclude all data outside the age range. For example, a person whose disability began at age eighteen could have his or her onset age mistakenly set to twenty-two if we disregard the responses to the disability question outside the age range.

11. The focus on male household heads is necessary because the PSID does not ask disability questions of spouses prior to 1981 (see Burkhauser et al. 2006).

12. See also Meyer and Mok (2012) for how the year of disability onset is determined for the disabled.

13. Approximately 400 individuals have missing data substituted in this way.

14. We exclude seventy-five individuals (1.2 percent of the sample) because key demographic information is unavailable.

15. If we require more than three (four to six) postonset positive limitation reports to be in the chronic group, the results are quite similar. Our disability persistence classification differs from that of Charles (2003), who defines the most chronically disabled group as individuals who report a positive limitation in every year after onset (as long as they are in the survey). Thus, in this author's classification system, whether an individual is chronic partly depends on the number of years an individual is in the survey; the use of a shorter panel (1968–1993) increases this dependence. Thus, a disabled person is more likely to be in the most chronic group the closer the year of onset is to 1993.

16. Twenty-five individuals in the main analysis who never respond to the severity question in this eleven-year period (year of onset and the subsequent ten years) are dropped.

17. Of the 1,819 disabled, 100 have a severity ratio of 0.5. Of the 846 chronically disabled individuals, only 43 have a severity ratio of 0.5.

18. In principle, these four groups are not fully ordered. We cannot say, a priori, that the Chronic-Not Severe group is "more disabled" than the Temporary group. In practice, though, the Chronic-Not Severe group fares much worse than the nonchronic groups, as shown in our analysis.

19. See Bound et al. (2007) and Kreider (1999) for discussions of the limitations of self-reported disability.

20. Members of each of the four disabled groups participate in the survey on average for at least 17.3 years in total and 10.0 years following disability onset. This long participation in the survey, particularly after onset, should reduce any concerns that the One-Time group members are categorized as such because they have exited the survey soon after disability onset. However, when we split the sample into shorter subperiods in Table 13.4, we will see that the classification is affected by the length of observation.

21. The number of family members is included in the income regressions. For earnings and income, we include interactions of education with age, age-squared, and time since 1968. For more details, see appendix 3 of Meyer and Mok (2012).

22. The analysis of Charles (2003) includes individual-specific time trends, which is one of the approaches in the Jacobson, LaLonde, and Sullivan (1993) analysis of earnings of the displaced. We suspect that disabling conditions have effects prior to disability onset, however, and we find that the results tend to be sensitive to the period over which such trends are estimated.

23. We use TAXSIM to generate tax liability estimates. See appendix 3 in Meyer and Mok (2012) for details.

24. See Meyer, Mok, and Sullivan (2009) for evidence of underreporting of public transfers in several data sets including the PSID.

25. See appendix 3 of Meyer and Mok (2012) for the method of estimating the value of housing subsidies used here.

26. The denominators of the percentage changes are obtained from the average of the predicted outcomes for the disability groups based on coefficients estimated using the entire sample.

27. For those surveyed in a year without wealth information, we use data from the most recent previous year with such information.

28. See note 27.

29. As noted above, the Chronic-Severe group is less numerous in these data because it only includes those with onset after 1984 when there are fewer years left on average to be classified as chronic. Higher attrition and every-other-year interviewing add to this tendency.

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