

A Cross-National Comparison of the  
Employment for Men With Disabilities:  
The United States and Germany in the 1980s  
and 1990s

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# **A Cross-National Comparison of the Employment for Men With Disabilities: The United States and Germany in the 1980s and 1990s**

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## **Abstract**

Using a single period measure to capture the population with disabilities in the Panel Study of Income Dynamics we observe the same dramatic decline in the relative employment rate of working age people with disabilities in the 1990s that is found in the Current Population Survey. We find that the trends in these two data sets are not significantly different over the 1980s and 1990s. This is also the case when we use longitudinal aspects of the PSID to develop long duration disability populations.

Using similar methods we compare the levels and trends in the relative employment of working age men with disabilities in Germany using data from the German Socio-Economic Panel. We find that while the relative employment rates of men with disabilities fall dramatically in both countries, the timing of these falls is not the same. Relative employment rates for German men with disabilities fell in the late 1980s but were constant over the 1990s while the opposite occurred in the United States. We argue that these differences in timing are more likely to be caused by differences in the timing of changes in the social environment these men faced than in differences in the timing of changes in the severity of their work limitations in the two countries.

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## Introduction

Using data from the Current Population Survey (CPS) one can show that the employment of working age people with disabilities in the United States rose and fell with the business cycle of the 1980s, but did not do so in the 1990s. Instead, over the growth years of the 1990s' business cycle, in contrast to men without disabilities, the employment of men with disabilities fell between 1992 and 2000 (see Figure 1).<sup>1</sup> The validity of the data used to measure the employment of working age men with disabilities as well as the causes for the dramatic change in their employment patterns are in dispute.

Critiques of this literature using alternative methods to define the population with disabilities conjecture that, once the increased severity of the work limitations of working age men with disabilities is accounted for, the employment rates of men with disabilities who are able to work increased in the 1990s (See especially Kaye, 2002, Kaye, 2003 and Hotchkiss, 2003). Still others dismiss all of these results as fundamentally flawed since they are based on a single period self-reported work limitation question that captures neither the actual working age population with disabilities nor its employment trends over time (See especially Hale, 2001 and Kirchner, 1996).<sup>2</sup>

This paper will first show that another nationally representative survey, the Panel Study of Income Dynamics (PSID), can be used to capture the working age population with disabilities and track its employment trends over the 1980s and 1990s.<sup>3</sup> In addition, its longitudinal nature allows us to investigate the differences in employment trends of a population defined as having a work limitation at a given moment (both short and longer-term work limitations) and the subcomponent of that population whose work limitations are longer lasting.<sup>4</sup> This longitudinal aspect of the PSID is important, since one of the criticisms of the CPS data is that a single period data set cannot distinguish between those people with temporary and longer-term disabilities (Hale, 2001).

We then use a longitudinal data set from another country – The Federal Republic of Germany – to both capture equivalent populations and compare the trends in employment of men with and without disabilities over the 1980s and 1990s in both countries. Germany is an excellent country to compare with the United States since both countries are among the most developed in

the world. However, they experienced dramatically different macro-economic events in the 1980s and 1990s. Both the United States and Germany experienced significant growth in the 1980s but Germany managed to do so with lower average unemployment rates and with little change in wage earnings or income inequality. In contrast, unemployment rates, especially in the early years of the 1980s in the United States were very high and inequality grew substantially over the entire period. However, economic fortunes in both countries changed in the 1990s.

The unification of the German Democratic Republic and the Federal Republic of Germany in 1990 resulted in much smaller and even negative yearly growth rates in the western states of Germany and a significant increase in unemployment rates over the rest of the decade. In contrast, in the United States, a minor recession at the start of the decade was followed by the longest continuous period of economic growth in American history as well as by a slowing in the growth of inequality. In addition, unemployment rates were on average lower in the United States in the 1990s than in the 1980s, while the opposite was the case in the western states of Germany where unemployment rates reached a peak of 11 percent in 1996 and remained at relatively higher levels throughout the decade.<sup>5</sup>

While the economic environment clearly differed in these two countries over the 1980s and 1990s, there is no reason to believe that the severity of work limitations or the timing of changes in that severity in Germany differed greatly from the United States over this period. Hence if it is true that the severity of work limitations increased in both the United States and Germany in the 1990s, we would expect to see parallel declines in the relative employment of working age men with disabilities in the United States and Germany in the 1990s. To answer this questions we will use data from the German Socio Economic Panel (GSOEP), a representative longitudinal data panel of the German population, to track the employment rates of working age men with and without disabilities and compare the levels and trends of employment rates in these populations over the 1980s and 1990s with equivalent populations in the United States.

### **Definitions and Measurement of Disability**

Nagi (1965, 1969, 1991) provides a conceptualization of disability as a dynamic process with three stages: pathology, impairment, and disability. Pathology is the presence of a physical

or mental condition that interrupts the physical or mental process of the human body. Impairment is a physiological, anatomical, or mental loss or abnormality that limits a person's capacity to function. Disability is defined as an inability to perform (or a limitation in performing) socially expected roles and tasks, like work.<sup>6</sup> Hence he sees both a social environmental and medical component to disability.

Many surveys, national and international, include questions about disability and work limitations that are consistent with Nagi's framework. But the use of these data remains controversial. Researchers have long questioned their validity for program evaluation (See Bound and Burkhauser 1999 and Moore 2001 for reviews). The primary concern is measurement error, i.e. that the levels of working age people *reporting* a work limitation may not coincide with the true population actually *having* a work limitation. Unfortunately, there is no consensus on the dimensions of the conceptually true population with disabilities. However, if the measurement error is truly random, only noise is added to the measured levels. If the error is systematic, the measured sample of individuals with work limitations could be a specific subset of the true population and therefore be subject to selection bias. This could constitute a serious problem in discussion of trends in employment, if the measured population is not following the same trend in employment as the true sample, (i.e. if the error is time dependent). Suppose, for example, that the severity of work limitations in the sample increases over time, while the (unobserved) true level is unchanged. This would lead to spurious conclusions about employment rates in the true population with work limitations. On the other hand, if the error is not time dependent, i.e. there is consistent under-reporting or over-reporting, the levels may not be correctly specified, but the trends of the true population and the observed sample are unaffected.

#### *Defining the work-limited population in the CPS*

The CPS is a cross-sectional survey with approximately 150,000 civilians interviewed in 50,000 U.S. households. Although the CPS is designed mainly to collect information about employment and income and not specifically to capture health trends, Burkhauser, Daly, Houtenville, and Nargis (2002) show that employment trends in the work limitation based disability population in the CPS are not significantly different from employment trends from

similarly defined samples in the National Health Interview Survey (NHIS) in the period from 1983-1996 that contain much more precise data on impairments.<sup>7</sup>

Starting with the 1981 March Demographic Supplement, the CPS includes a question about health limitations: “*Does anyone in this household have a health problem or disability which prevents them from working or which limits the kind or amount of work they can do? [If so,] who is that? (Anyone else?)*” This work limitation question is consistent with Nagi’s framework of a disability developing from a pathology that limits a social activity, work. But Burkhauser, Daly, Houtenville and Nargis (2002) show that this question fails to capture persons who objectively would be considered impaired, but do not categorize themselves to be work limited.

Although the CPS is a cross-sectional survey, it tracks people over the course of a year. Specifically, the CPS follows households over a four-month period and then returns eight months later to follow them for another four months. This allows us to match individuals over a one-year time interval. Hence we are able to construct a sub-sample of households interviewed within the March Supplement that are asked the work limitation question in two consecutive years. We use these individuals to create a two-period CPS sample, consisting only of individuals present in two consecutive March Supplements.

We then apply two definitions of disability: The first is a one-period measure, i.e., individuals answering “yes” to the work limitation question in any given year are considered to be disabled in that year. The other definition is a two-period measure, which defines people to be disabled only if the individual has a work limitation in two consecutive periods one year apart. Since temporary health limitations will affect our one-period measure, we expect a lower percentage of the overall population to be work limited when using our second measure.

#### *Defining the work-limited population in the PSID*

The PSID is a longitudinal survey that started in 1968 interviewing approximately 4,800 families. The main focus of the PSID interview is topics of dynamic demographic and economic behavior, but it includes psychological and sociological measures as well. In 2001, the sample consisted of 7,000 families.

We use the following question in the PSID to define the work-limited population: “*Do you (Head) have a physical or nervous condition that limits the type of work or the amount of*

*work you can do?*” This PSID work limitation question is similar to the question in the CPS and consistent with Nagi’s framework. Unfortunately, the PSID and specifically this question have been subject to numerous changes in the more than 30 years the PSID has been conducted and hence comparisons of sample means and trends between some years are questionable. We therefore only consider the survey years 1976-1997.<sup>8</sup>

We again use the two previously defined definitions of disability, the one- and two-period measure. In addition, we are able to use the PSID sample to show trends in employment for populations who report a work limitation of larger duration (i.e. two and three years).

### *Defining the work-limited population in the GSOEP*

The SOEP is a longitudinal survey of residents of Germany that started in 1984 in the western states with a representative sample of over 12,000 people in almost 6,000 German and “Guest Worker” households.<sup>9</sup> Several changes in sampling have occurred. With the unification of Germany more than 2,000 households in the eastern states of Germany were added in 1990 and in 1994 and 1995 new samples of immigrants (around 1000 individuals) were included. In 1998, a “refreshment” sample added around 1,000 households. In 2000, the “innovation” sample almost doubled the sample size of the existing GSOEP, with more than 10,000 new individuals. To keep our sample homogeneous and to ensure validity over time, we restrict our attention to men in the sample of Germans living in the western states of Germany and only consider those Germans in the original, the refreshment, and the innovation samples.<sup>10</sup> The GSOEP is a restricted access 95 sample of these date made available to researchers outside of Germany through Cornell University.

A critical part of this analysis is how to define a population of people with work limitations in the GSOEP that is comparable to the definitions in the CPS and the PSID. The GSOEP includes several different questions related to work limitations over the years, but besides information on current health satisfaction, none of these is asked in all survey years. A health satisfaction question cannot be used by itself as a disability measure, since individuals with impairments can have high levels of health satisfaction. In order to obtain a more precise estimate, we also use the following information on a person’s official disability status: “*Are you officially registered as having a reduced capacity for work or of being severely disabled? If yes, what is the degree of your disability?*”

This official registration is made by the German Pension Office, which also assigns a degree of disability, ranging from 1 to 100 percent.<sup>11</sup> Unfortunately this question is not asked in 1986, 1990, and 1993.<sup>12</sup> However, the probability of being registered in any one year is very high (around 95 percent), given the person was registered in the previous and the following year.<sup>13</sup> Thus we impute this value, marking persons as “officially registered” in one of these years if they report being registered in both the year before and after the year the question is not asked.

We define a man to be “work limited” if he reports being officially registered in a given year and has a degree of disability of 50 percent or higher, or if he reports a health satisfaction level of 2 or less. (See the Appendix B.3 for a fuller discussion of our measure.)

As we did in the CPS and the PSID, we compute two measures of disability, a one-period measure including all men who are defined as having a work limitation, and a two-period measure, including all men that have a work limitation in two consecutive periods.

### *Defining employment*

Our samples are restricted to working age individuals aged 25-59 to avoid mis-measurement due to retirement or schooling. Employment in all three datasets is defined the same way. Anyone who worked more than 52 hours in the previous year is considered employed.<sup>14</sup> This threshold is low, but employment rates trends of our populations are not significantly affected by using higher employment thresholds.

In the one-period settings, we only use information from one survey year. In all three surveys, in any given year (say  $t+1$ ), individuals are asked about the total amount of hours worked in the previous year ( $t$ ). We take that information to define employment in the sample of individuals with a work limitation in year  $t$ .<sup>15</sup> In the two-period samples, an individual is considered to have a disability and to be working, if he or she reports a work limitation in both years ( $t$  and  $t+1$ ) and reports in the second year survey ( $t+1$ ) to have worked more than 52 hours in the previous year ( $t$ ). This information yields a data point in the first year ( $t$ ).

## Data Analysis

### *Comparing CPS and PSID*

In this section, we compare our PSID and CPS findings for working age men. While we graphically show levels and trends in these data, we also formally test for differences in levels and trends using regression analyses.<sup>16</sup> Our model is:

$$\bar{X}_t = \alpha_0 + \beta_0(\text{time}) + \alpha_{\text{CPS}} + \beta_{\text{CPS}}(\text{time}),$$

where  $\bar{X}_t$  is the estimate (e.g. disability prevalence rate, employment rate) in year  $t$ ,  $\alpha_0$  is the average level of the PSID series for the whole period of observation, and  $\beta_0$  measures the time trend of the PSID. The goal of this comparison is to test the validity of the PSID, i.e. to see whether the PSID can capture the same levels and trends of the impaired population as the CPS. The datasets have different levels if the intercept for the CPS,  $\alpha_{\text{CPS}}$ , is statistically different from zero, and they show different time trends, if  $\beta_{\text{CPS}}$  is statistically different from zero.<sup>17</sup>

Figure 2 shows the work limitation prevalence rates in both surveys. The single period measures have different levels. Measurement problems seem to be apparent when we look at the saw-tooth pattern of the PSID series in the 1980s. We are not able to consistently relate this pattern to any of the concerns raised in Appendix A. In contrast, the stable period in the PSID between 1992 and 1996 could be contributed in part to the relatively unaltered questionnaire in those years.

The level of the two-period series measure is below the one-period measure in both datasets. This shows that a one-period measure includes a substantial number of persons with temporary work limitations. Note that the two-period PSID series is less volatile than its one-period counterpart, which indicates that by focusing only on these longer duration people, measurement error is likely to be reduced. Nevertheless, both PSID series experience a far greater variation than is apparent in the CPS data. One explanation could be that the relatively small PSID sample size does not allow for a “smoothing” of the series.<sup>18</sup> However, comparing the trends between the CPS and the PSID, we find they are not significantly different in the one-period sample but are significantly different in the two-period sample.<sup>19</sup> When we statistically

compare the series within the datasets, i.e. the CPS (PSID) one- and two-period series, we conclude that the levels are significantly different but the trends are not.

The employment rates for working age men with work limitation based disabilities in the CPS and PSID are shown in Figure 3. The levels of the employment rates are higher in the PSID than in the CPS. This is a general finding that is explained by the fact that the PSID captures more employment than the CPS, especially for dual and part time jobholders.<sup>20</sup> In addition, in both data sets the population defined by our two-period measure has lower employment rates than its one-period counterpart. This is consistent with the argument that the two-period series capture more severe cases, i.e. there are more people within this subset of individuals with work limitation that have both longer-term and more severe impairments.

Although the levels are different, the relationships between employment rates across the samples are much closer than was true for disability prevalence rates. For both the one- and two-period samples, the similarity between the two datasets is striking. For example, the small dip in 1988 is found in all four series as well as the small peak in 1996.<sup>21</sup> In general, all series follow business cycle movements in the 1970s and 1980s, while in the 1990s we observe a decline in employment despite a long period of economic growth.

Our impressions are confirmed by our regression tests. We find that the employment trends in the two data sets are not significantly different in either the one- or two-period samples, i.e.  $\beta_{\text{CPS}}$  is not statistically different from zero. Similar to the prevalence comparison within the datasets, we observe that one-period employment levels are significantly higher than their two-period counterparts, but the trends between the two series are not statistically different from one another.<sup>22</sup>

While it is useful to look at the employment of men with disabilities we want to focus on their employment relative to those men without disabilities to make sure that the trend for men with disabilities is not simply mirroring economic developments in the entire labor force. Such effects are accounted for when we look at relative employment, i.e. the ratio of employment rates for men with disabilities over the employment rates for men without disabilities in Figure 4. So doing, we see that the employment levels and trends are very similar to those in Figure 3. The employment of men with disabilities dramatically fell relative to the employment of men without disabilities over the course of the 1990s and especially in contrast to the 1980s.<sup>23</sup>

### *Longer-Term Disabilities in the PSID*

We now investigate, whether our cross-sectional findings for employment outcomes extend to a population with longer-term work limitations. We define four samples, with persons reporting a work limitation at least for one, two, three, and four consecutive periods respectively.<sup>24</sup> Figure 5 shows the employment rates for these samples. We continue to observe relatively large differences in employment levels between our one- and multi-period samples, but the differences between the three longer-term disability measures (at least one, two or three periods) are much smaller. This may be because the severity of work limitation in a sample is relatively stable once individuals with short-term limitations are omitted. While different in levels, the trends among the four samples are closely related. Again, while employment rates follow the business cycles in the 1970s and 1980s, all samples show dramatic declines in employment over the first half of the 1990s.

The regression analyses for these series confirm this impression: the time trends of the two-, three-, and four-period specifications are not statistically different from the one-period time trend. To complete our analysis, we compare the CPS-sample of individuals that are work-limited for one period with the PSID-samples. The regression analysis in this case also shows that the time trends are not statistically different between the two samples.

In Figure 6 we complete the analysis of the multi-period samples by showing the relative employment series of the one-, two-, three- and four-period samples. Similar to our comparison of relative and actual employment in Figures 3 and 4, we do not see large differences from the results reported in Figure 5. Regressions again confirm that the levels differ, but the trends between the multi-period PSID series as well as the CPS one-period sample are not statistically significantly different.

### *Comparing CPS, GSOEP, and PSID*

Figure 7 shows the disability prevalence rates for men living in the western states of Germany between 1984 and 2002. Since it is unlikely that the actual disability prevalence rates in the population rise and fall and rise from year to year, (although they might do so in one direction or the other) the stability in this figure suggests that our measure of the population of disabled men is reasonable.<sup>25</sup> In our regression analysis, we find a very small negative time trend for the one-period series and no significant time trend for the two-period series. This is an

outcome of our measure that is not inherent in its construction. Again we observed, that the two-period definition yields a smaller population with disabilities, although the difference is smaller than in the United States data.<sup>26</sup> The trends in prevalence between the one- and two-period samples, however, are not statistically different from one another.

Figure 8 shows the employment rates of men living in the western states of Germany aged 25-59 with and without disabilities. There is an almost continuous decline in the employment of all three populations (those without disabilities, those with a one-period disability and those with disabilities measured in two consecutive periods). The downward trend in employment rates for men with disabilities appears to have begun earlier (around 1987) than the decline in the employment rates men without disabilities, which started in 1990, the year of German unification.

Once again, we see that those classified into the two-period sample of men with work limitations are less likely to be employed than their one-period counterparts, and both populations of disabled men are less likely to be employed than working age men without disabilities. These differences in employment levels are statistically significant, whereas the regression analysis shows that the trends in employment rates for work-limited men between the one- and two-period series are not statistically significant. From a policy point of view, however, it is important to investigate what happened to the relative employment of men with and without disabilities in Germany.

Figure 9 depicts the relative employment rates for the GSOEP and the CPS.<sup>27</sup> If we compare the data over the whole observation period, there is little difference statistically. The relative employment of men with disabilities is significantly lower throughout but there is no significant difference in trends between the two countries. But there are important differences in that trend over the period. In the western states of Germany, the decline primarily occurs between 1986 and 1990 (almost entirely because of the decline in the employment of men with work limitations). But for the rest of the decade, relative employment is more or less constant as the employment rate of both men with and without work limitations falls. In the CPS, the timing of the trends is exactly the reverse. The employment rates of those with and without work limitations move in the same directions in the 1980s resulting in little movement in the relative rates of employment but move in opposite directions in the 1990s leading to a dramatic fall in the relative employment of those with work limitations.<sup>28</sup> When we test for differences in time

trends in the two periods (i.e. 1980-1990 and 1991-2001), we find no significant trend in the relative employment rates in the western states of Germany in either period. In the United States, there is no significant trend in the 1980s, but in the period from 1991 to 2001, there is a significant negative trend.<sup>29</sup>

## **Conclusion**

Our results provide new evidence relevant to the controversy over the quality of current data on the working age population with disabilities. We show that two nationally representative surveys, the PSID and the CPS, capture the same employment trends for men with disabilities over the 1980s and 1990s. We also establish that these trends are not significantly different when we use the longitudinal aspect of the PSID to only look at men with longer-term disabilities. Thus we argue that the CPS is not only capturing employment trends for the population with temporary work limitations, but, although different in levels, reflects trends for longer-term disabled individuals as well. We also provide a measure in a data set from another country (the GSOEP) that can provide consistently estimated employment rates for individuals with and without disabilities in the western states of Germany in the 1980s and 1990s.

We then compare the levels and trends in the relative employment rates of men with disabilities in these two countries and offer some evidence that while the relative employment of men with disabilities fell over the twenty years of our analysis in both countries, the timing of that fall was quite different. Furthermore, we argue that these patterns are inconsistent with a common increase in the severity of the work limitations of those with disabilities in the 1990s. The relative employment rates of men with work limitation began to dramatically decline in the United States in the 1990s, while for men with disabilities in the western states of Germany, there is a major decline observable in the late 1980s that ends in the 1990s. Hence, the patterns of decline in the two countries are quite distinct. It is unlikely that common changes in the severity of work limitations can explain this dramatic difference in the timing of the decline in relative employment of men with work limitations in the two countries. It is much more likely that its source is differences in the social environment.

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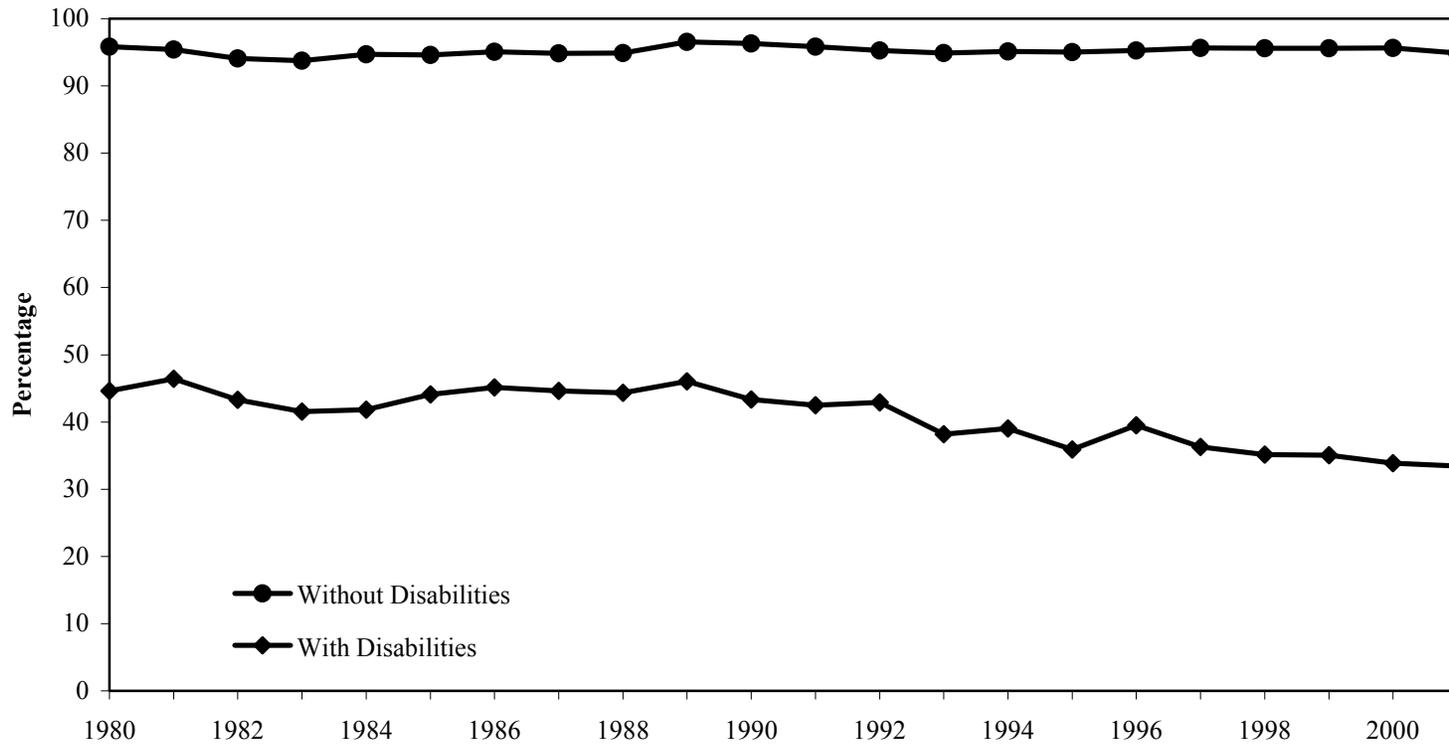
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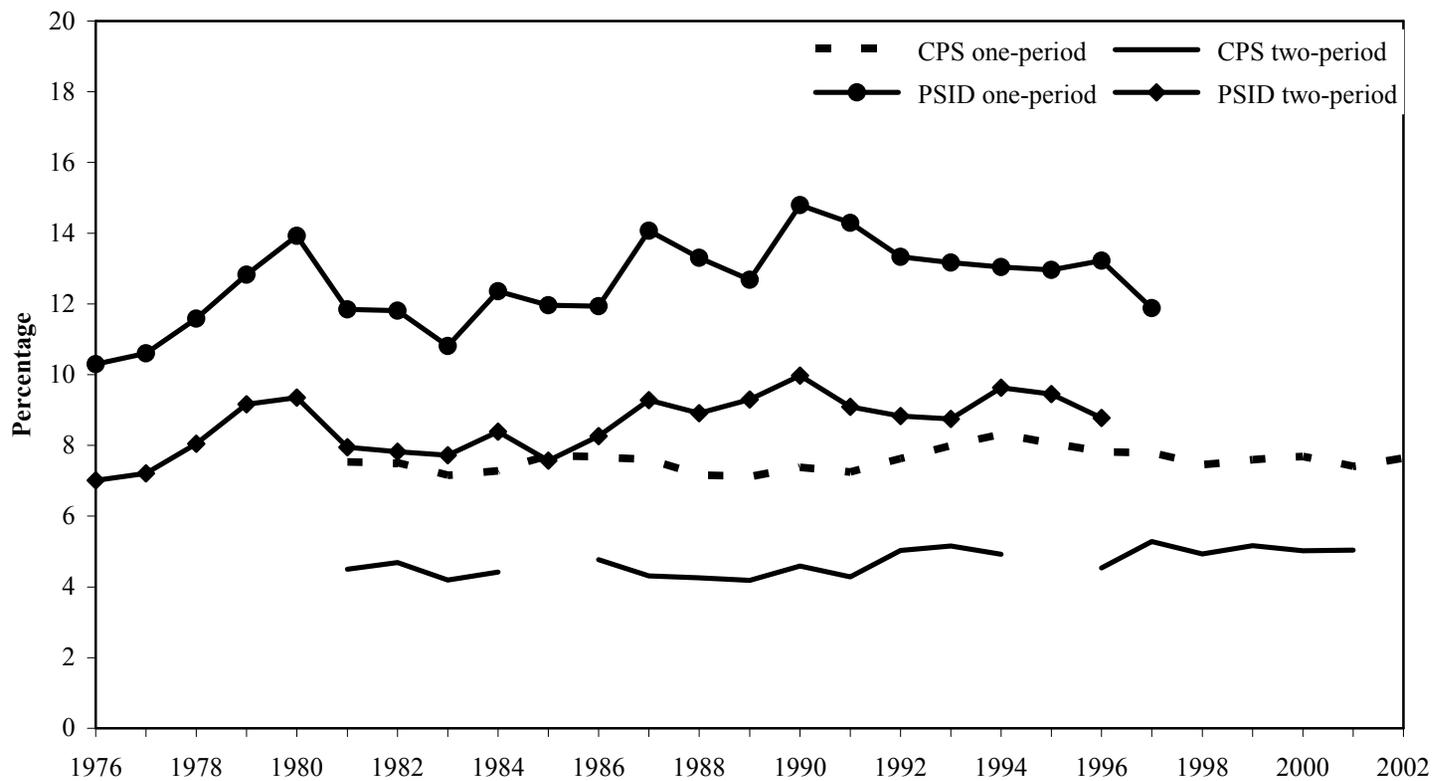
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**Figure 1. Employment Rates of Men Aged 25 - 59 With and Without Disabilities Using CPS Data.**



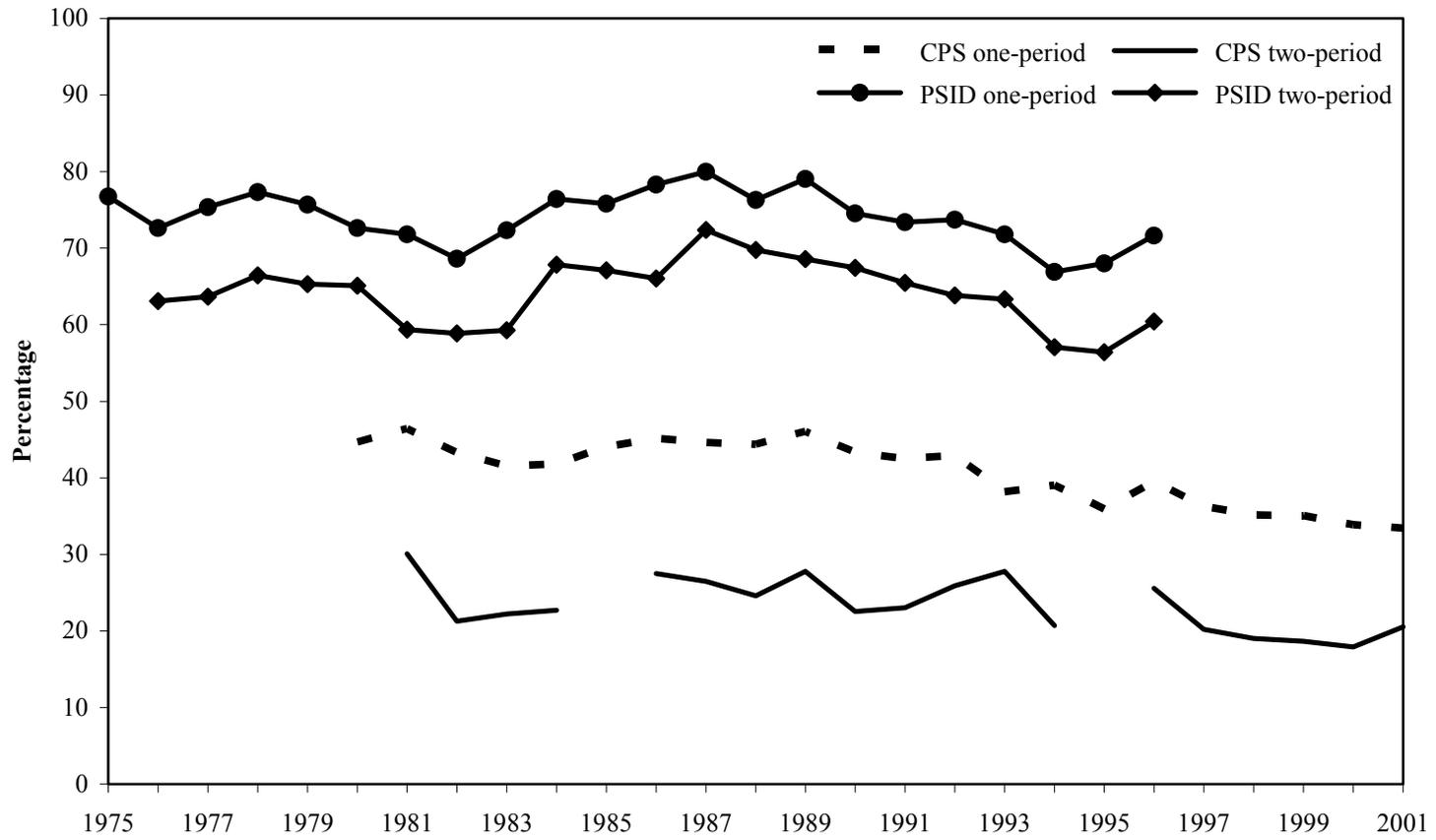
Source: Current Population Survey 1981-2002, authors' calculations.

**Figure 2. One- and Two-Period Disability Prevalence Rates Men Aged 25 - 59 Using CPS and PSID Data.<sup>30</sup>**



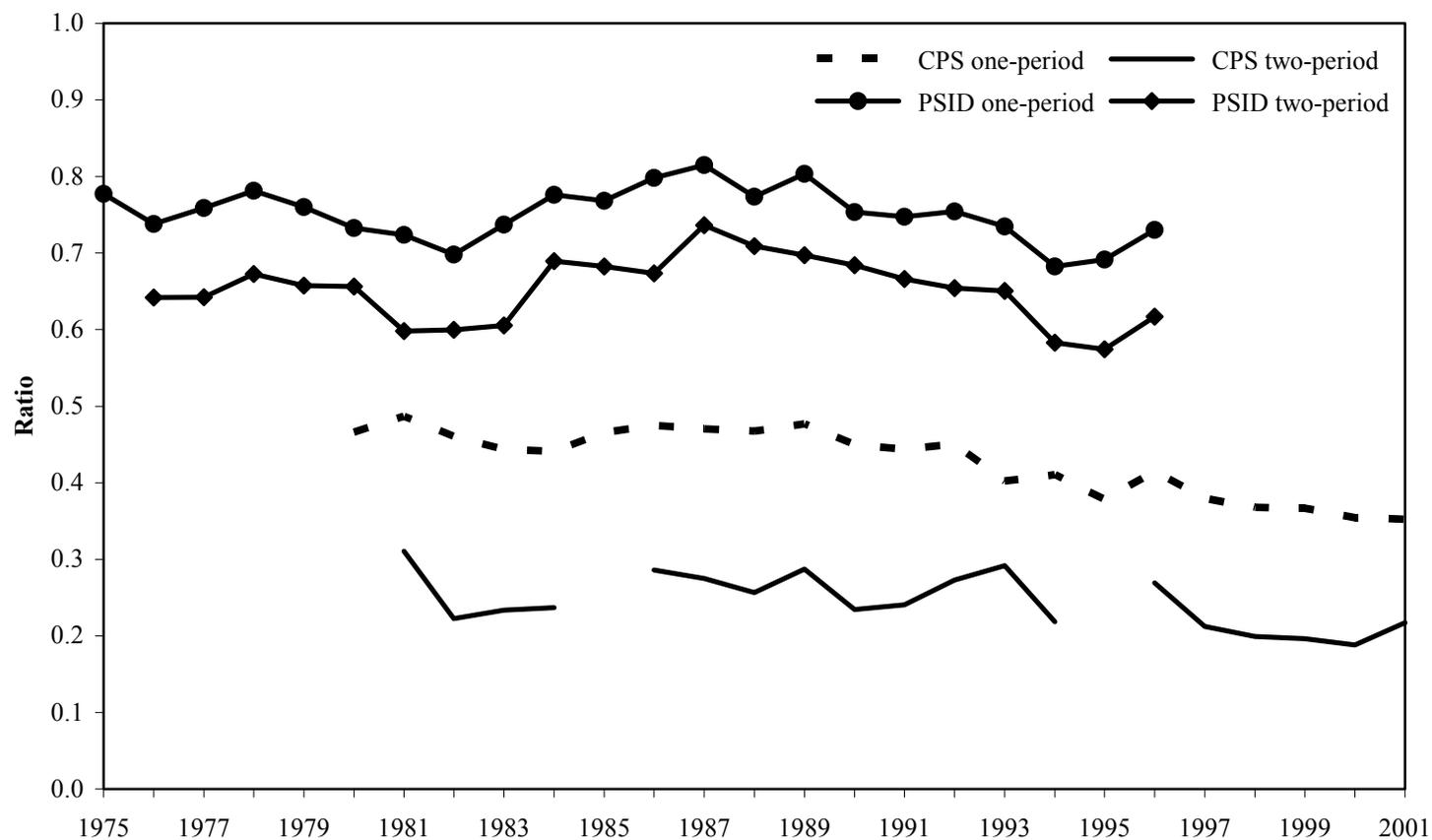
Source: Current Population Survey 1981-2002, Panel Study of Income Dynamics 1967-2001, and authors' calculations.

**Figure 3. One and Two Period Employment Rates for Men Aged 25-59 With Disabilities Using CPS and PSID.**



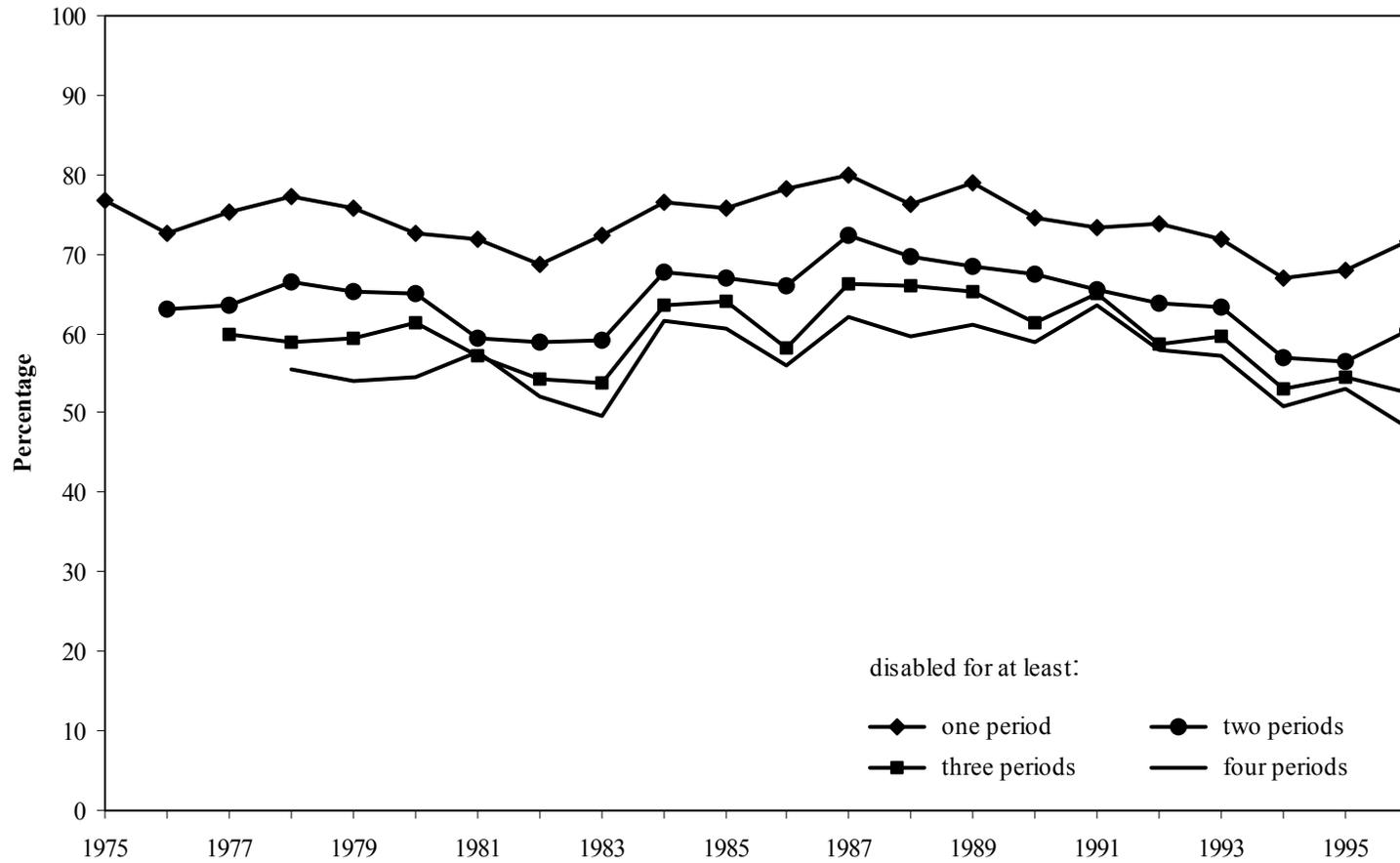
Source: Current Population Survey 1981-2002, Panel Study of Income Dynamics 1967-2001, and authors' calculations.

**Figure 4. One- and Two Period Relative Employment Rates for Men Aged 25 – 59 With and Without Disabilities Using CPS and PSID Data.**



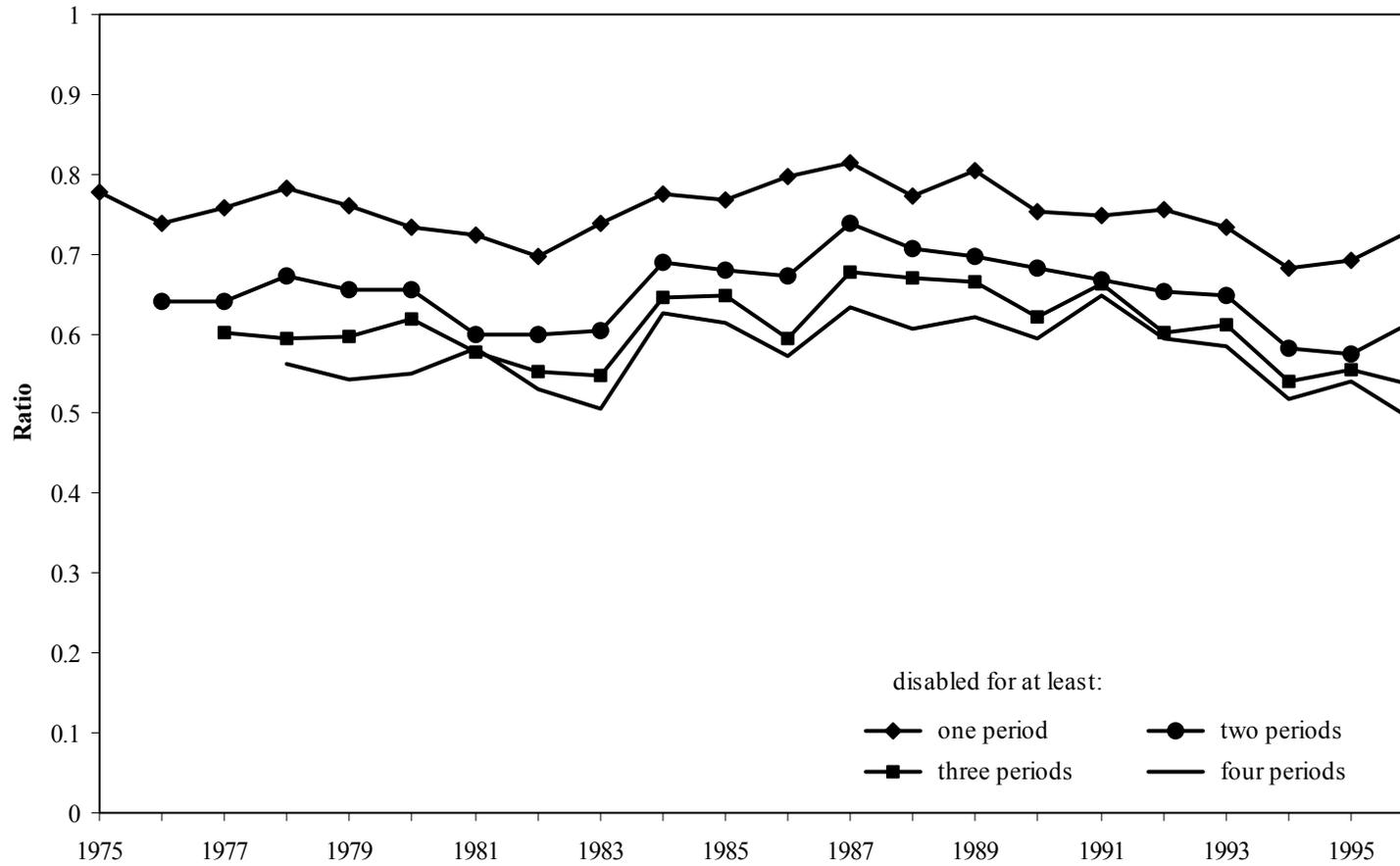
Source: Current Population Survey 1981-2002, Panel Study of Income Dynamics 1967-2001, and authors' calculations

**Figure 5. One-, Two-, Three- and Four-Period Employment Rates for Men Aged 25 -59 With Disabilities Using PSID.**



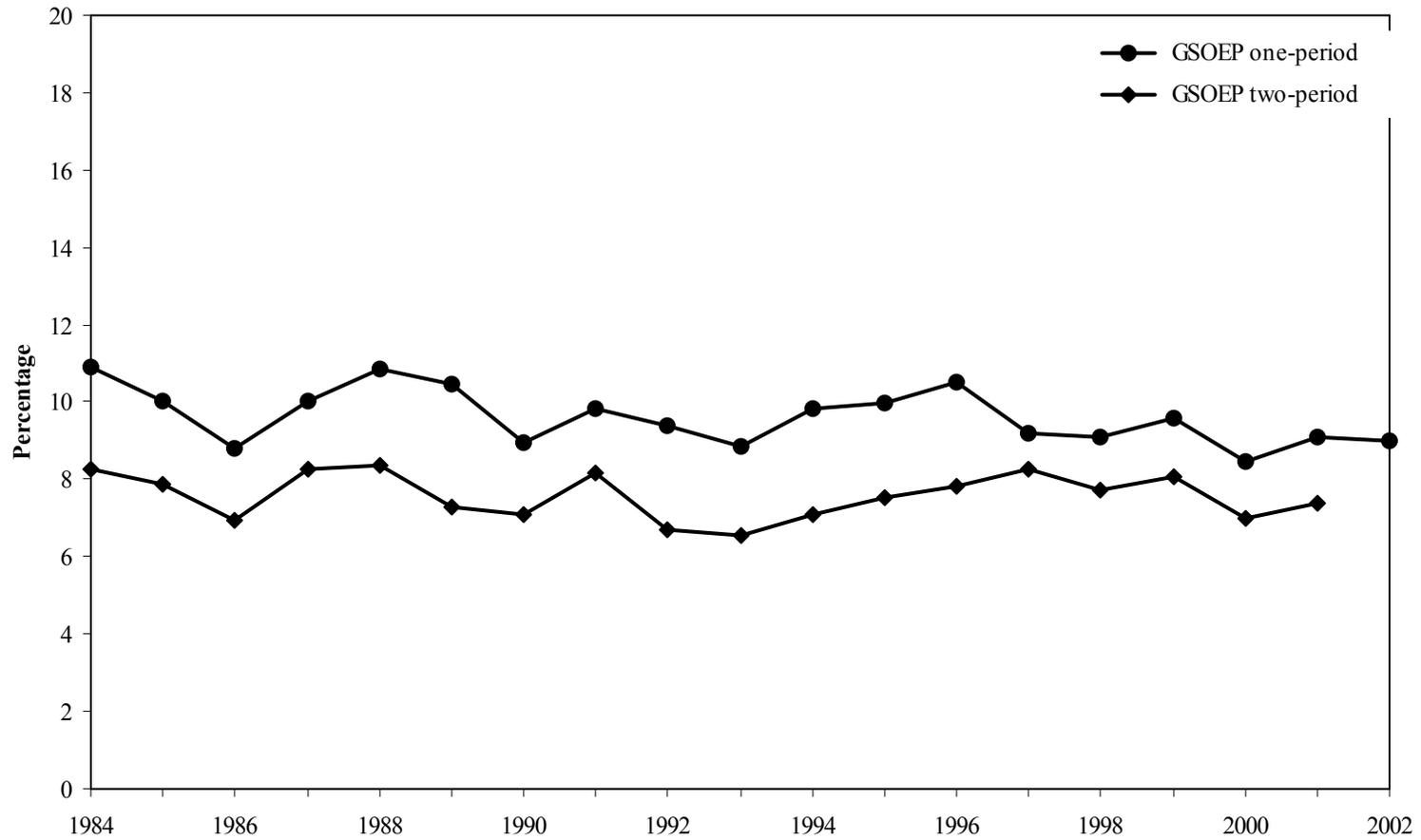
Source: Panel Study of Income Dynamics 1967-2001, and authors' calculations.

**Figure 6. One-, Two-, Three-, and Four-Period Relative Employment Rates for Men Aged 25-59 With and Without Disabilities Using PSID Data.**



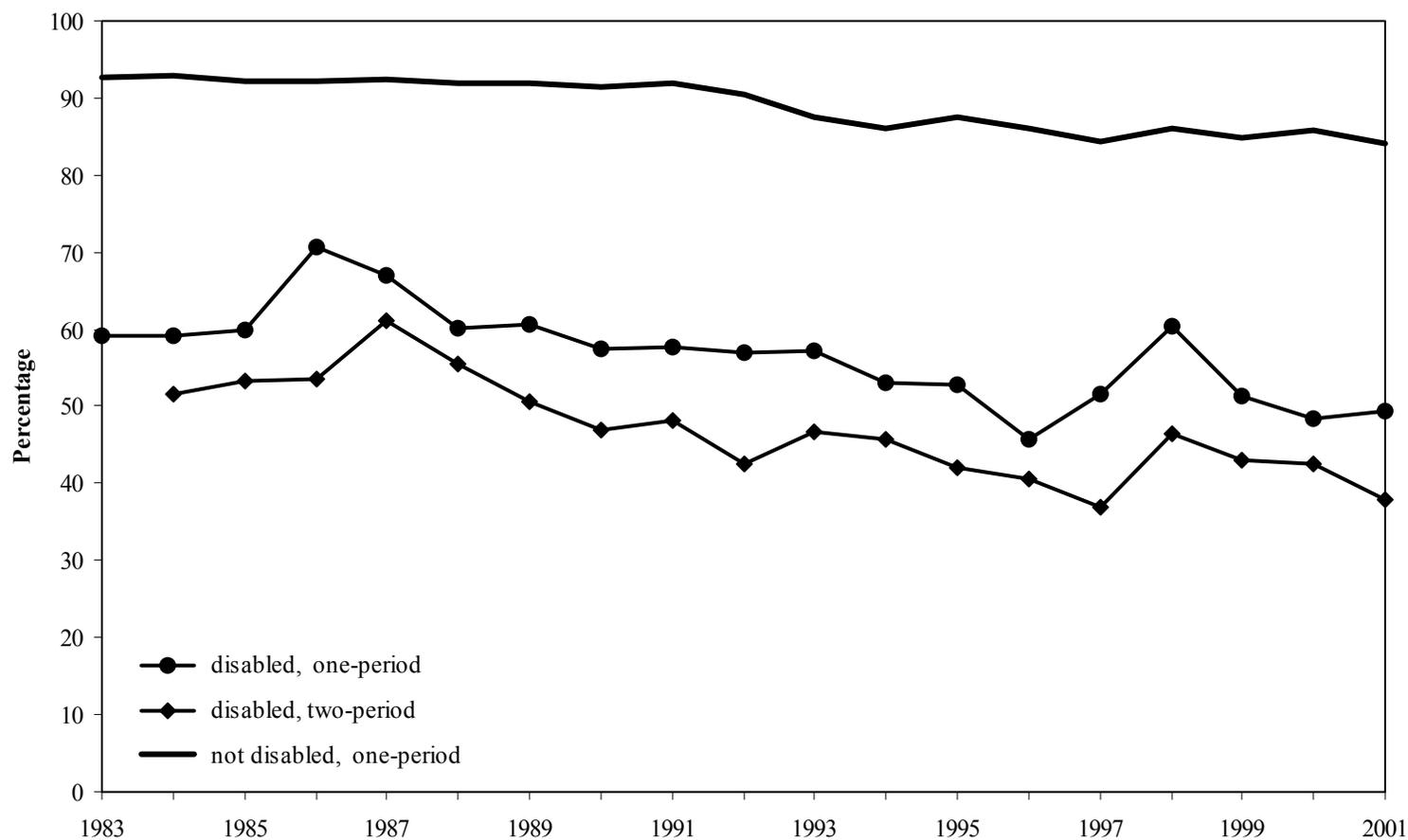
Source: Panel Study of Income Dynamics 1967-2001, and authors' calculations

**Figure 7. One-, Two-Period Disability Prevalence Rates for Working Age Men Aged 25-59 Using GSOEP Data.**



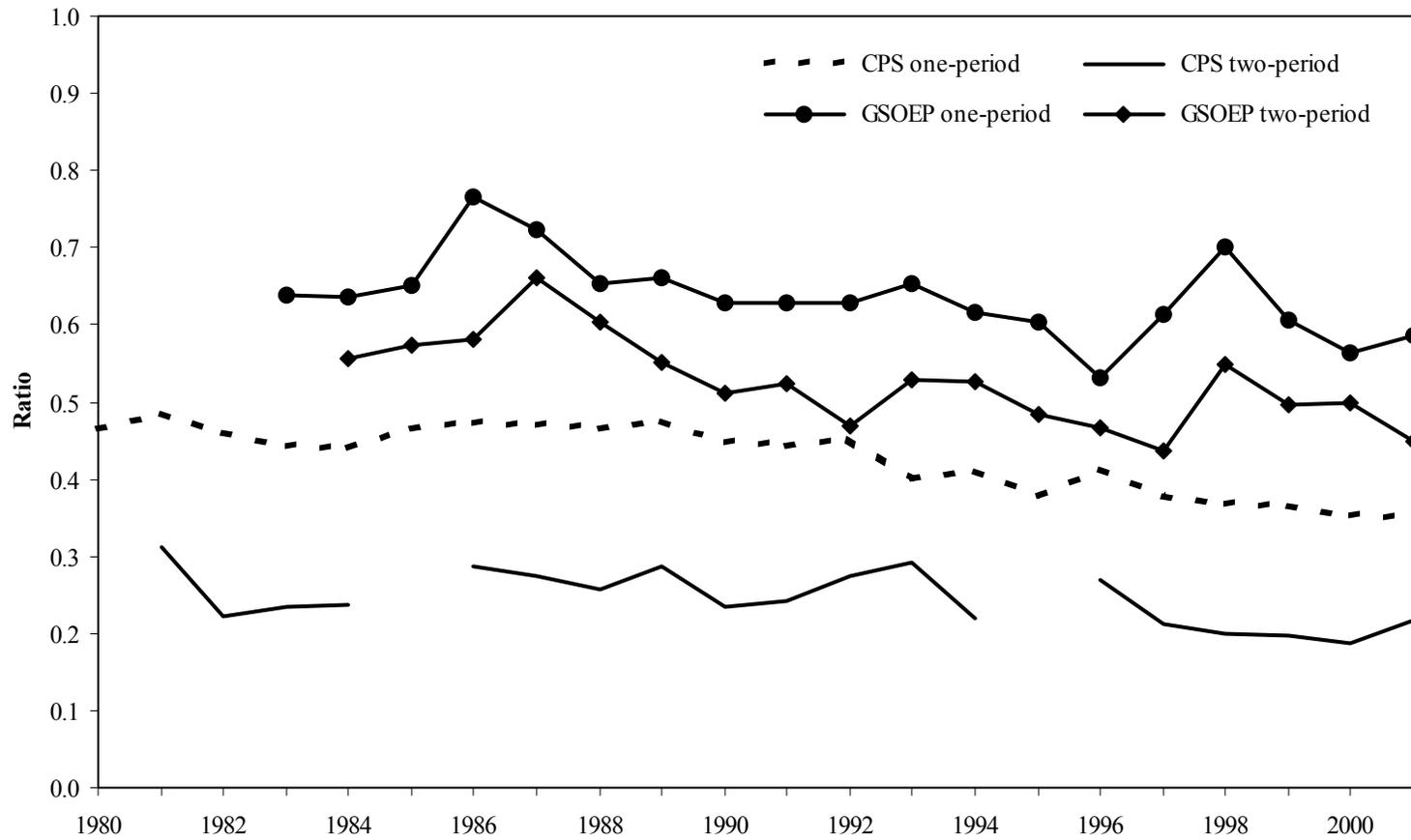
Source: German Socio Economic Panel 1984-2002, and authors' calculations

**Figure 8. One-and Two-Period Employment Rates for Men Aged 25-59 With and Without Disabilities Using GSOEP Data.**



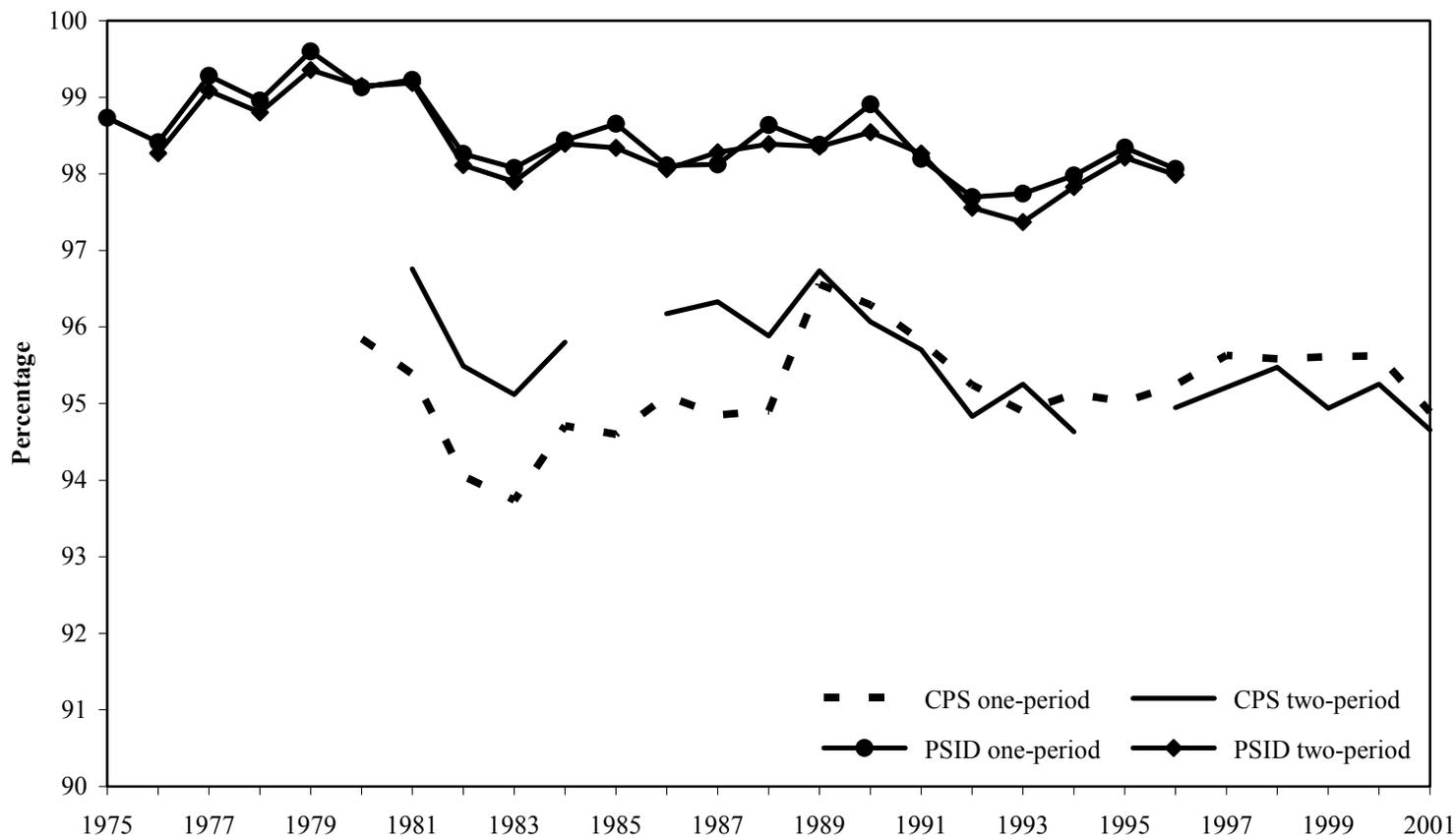
Source: German Socio Economic Panel 1984-2002, and authors' calculations

**Figure 9. One-, and Two Period Relative Employment Rates Men Aged 25-59 With and Without Disabilities Using CPS and GSOEP Data.**



Source: Current Population Survey 1981-2002, German Socio Economic Panel 1984-2002, and authors' calculations

**Figure 10. One- and Two-Period Employment Rates Among Men Aged 25-59 Without Work Limitations Using CPS and PSID Data.**



Source: Current Population Survey 1981-2002, Panel Study of Income Dynamics 1967-2001, and authors' calculations.

## *Appendix A: The PSID*

The following changes in the general PSID procedure and the specific work-limitation question lead to our decision to not consider survey years before 1976 and after 1997:

**Changes in the type of interview:** The interviews in the early years (1968-1972) were face-to-face interviews whenever possible. The fraction of telephone interviews was less than 3 percent in these years. From 1973 onward, this relationship is almost reversed, with around 90 percent of the interviews conducted by phone. This change may affect measurement error, i.e. bring about a time dependency as discussed in the text, since respondents may behave differently when asked in a personal conversation rather than in a phone interview. The fact that the PSID interviews in these years took much more time to complete than in subsequent years suggests that this may be the case.

**Changes in the question:** In 1969, 1970 and 1971, the work limitation question was asked in a slightly different way, making comparisons with other years problematic. Specifically, the question was split into three parts asking (a) whether the individual had an inability to do some kinds of work, (b) whether there were limitations to the amount of work, and (c) whether there existed health restrictions affecting housework only. Although the original question is included in spirit, it is difficult to combine the three parts to obtain a consistent measure of work limitation. This, again, could lead to a time-dependent change in measurement error.

**Changes in the procedure:** In 1973, 1974, and 1975, the PSID did not ask the work limitation question of those who were in the sample in 1972, assuming that the answer would not change. For new entrants, the question was asked only at entry into the sample. This procedure constitutes several problems: First, the onset of a disability of a sample member interviewed in

1972 (or new entrants in the years after their entry) cannot be captured. Second, temporary work limitations are erroneously carried over into subsequent years. This systematically changes the measurement error. Third, there is almost no difference between samples of individuals with temporary and longer-term work limitations, in stark contrast to all other years. Another change in procedure occurred in 1997, when the PSID moved to a biennial interviewing scheme, i.e. interviews were conducted only in 1999 and 2001. This influences the attrition rates in the survey, and therefore could lead to systematic changes in sample composition.

**Changes in the placement of the question:** The work limitation question's placement has varied over the years. This could have an independent effect on the response, similar to a finding Maag and Wittenburg (2003) report for the SIPP. For example, the response to the same work limitation question may differ, if asked as part of a health supplement rather than as a single question in the context of income and work related topics. Specifically, up to 1984, the work limitation question in the PSID was asked as part of the income section and was not related to other health questions in the questionnaire. From 1985 to 1991, the question was included in a section that contained about 10 to 15 health related questions. In 1986, the PSID conducted a health supplement (including the work limitation question), where the household head was asked several questions about his and his spouses' health. This extended the health part of the questionnaire to 67 questions.<sup>31</sup> With the exception of 1997, an extended health section was provided from 1992 onward, including more than 50 questions. To sum up, multiple changes in placement and context of the PSID work limitation question may have influenced the levels and trends in a non-random, time-dependent way.

**Changes in the population interviewed:** In 1992 and 1993 the follow-up procedure changed. In 1993, more than 1000 individuals were re-contacted. If the re-contacted families

were in better health than those that were already in the sample, this could bias the disability prevalence downward.

**Changes in data collection methods:** Finally, the technology employed to impute and code PSID data has become much more elaborate and accurate over time. If data collection is a part of the measurement error, then even if the individual mis-reporting did not change over time, the improvement in the coding procedures could have an impact on the levels and trends observed.<sup>32</sup>

## ***Appendix B: The GSOEP***

### *The German disability registration system*

The German health system providing benefits to people who are officially registered as having a disability. A person can claim to have a disability when the body functions, the mental abilities or the nervous system restrict social life with a high probability for at least six consecutive months. Persons have to prove their disability status regularly with medical documents they send to a government institution (the Pension Office), which then determines the actual degree of disability, ranging from 1 to 100 percent. For example, a person with a heart condition that leads to a minor hindrance is disabled to a degree of 10 to 40 percent, mediocre psychosis is classified between 50 to 70 percent, and a lost arm leads to a disability status of 100 percent. Combinations of two impairments are possible, so that two minor impairments might lead to a severe classification. All people who are officially registered and have a degree of disability of 20 percent or more get financial benefits, e.g. tax exemptions, deductions on insurance payments, rent allowances, etc. People with a degree of 50 percent or higher are severely disabled, and are subject to special treatments in the labor market. This mainly involves counting forward the official quota with more than 19 employees must meet. Such firms must employ at least 5 percent of severely disabled persons or otherwise pay a penalty of up to \$280 Dollars per month for each person not employed to the 5 percent level. This quota was 6 percent prior to 2000. Individuals with a degree of disability between 30 and 50 percent can apply to be treated equally to a person with a degree of 50 percent or more, if they can prove that their disability affects their employment possibilities in the same way.

### *The imputation of missing values*

In order to justify our imputation of an official disability status in the years 1986, 1990, and 1993, where this question was not administered to the whole sample, we take individuals present in at least three consecutive waves of the GSOEP, who report a registered disability in the first and in the third year, and obtain the mean of those who are also reporting to be registered in the second year. Due to the missing years, this three-year window is only possible for 1988, and from 1995-2002. Table B.1 shows the weighted means for all available years as well as the overall weighted mean for the sample of our analysis, i.e. German men in West Germany, age 25-59. As can be seen most persons who have official disability status in  $t-1$  and  $t+1$  also have it in  $t$ .

**Table B.1. Percent of Persons Who are Registered for a Disability if Registered in the Previous and Following Year**

<b>Year</b>	<b>Mean</b>	<b>Sample Size</b>
<b>1988</b>	0.974	154
<b>1995</b>	0.943	164
<b>1996</b>	0.962	164
<b>1997</b>	0.908	158
<b>1998</b>	0.951	149
<b>1999</b>	0.966	167
<b>2000</b>	0.961	154
<b>2001</b>	0.942	278
<b>Total</b>	0.949	1388

Source: GSOEP 1984-2002, authors' calculations

### *B.3 The procedure to find the optimal definition of disability in the GSOEP*

To accomplish the task of finding a suitable combination of the questions about health satisfaction and about the degree of registered disability that then can be used to define the work-limited population in every wave of the GSOEP, we use the 2002 release. This wave includes a health supplement, the so-called SF-12. The SF-12 is a standardized questionnaire, developed and used mainly in the medical literature to assess patients' current health status. A mental and a physical health measure are given by twelve health-related questions, which are scored and weighted with a specific algorithm.<sup>33</sup> Certain thresholds for these two scores then define three types of disability: mild, moderate and severe disability. In our analysis, we use the threshold for severe disability to define the population of work-limited individuals in the GSOEP 2002 wave.

In a first step we measure the correlations with overall sixty-two combinations of the two questions mentioned above. These combinations include variations of different satisfaction levels combined with different degrees of disability, i.e. combinations of satisfaction levels of less or equal to 2, 3, and 4 in 2002 and different thresholds for registered degrees of disability in 2002, i.e. registered at all, greater or equal 20 percent, greater or equal 30 percent, and greater or equal 50 percent. We also use dynamic measures, i.e. we allow for combinations where persons report a level of health satisfaction below a certain level in both 2001 and 2002 as well as for officially registered disability in both years.

In a second step we measure how close the sample averages obtained by the various combinations are to the sample averages given by the SF-12 measure of severe disability. Then, all combinations are given two ranks according to their performance in the two categories, and the combination measure with the best overall ranking is chosen.

Table B.2 shows how the choice of the best performing combination of two health related questions was made. The twenty possible candidates shown here are a subset of the originally sixty-two possible combinations. The sample proportion of severe disabled as classified by the SF-12 questionnaire is 12.5 percent. The considered sample is the full GSOEP of the years 2002 and 2001, where the 2001 sample is used for the dynamic analysis of two-period definitions. Definition 24 is the one mentioned in the text, i.e. the population of registered disabled at 50 percent or higher, augmented with the people who report a level of satisfaction with their health of two or less. Definition 2 is only considering individuals with a satisfaction level of three or less, whereas definition 37 is the population of people reporting a satisfaction level of three or less in both 2001 and 2002, augmented by all with a registered degree of disability of 50 percent or higher. Further definitions can be obtained from the authors on request.

**Table B.2. Characteristics of Different Definitions of the Population with Disabilities Using GSOEP Data.**

<b>Definition</b>	<b>Sample Proportion Disabled as given by Definition</b>	<b>Difference with SF-12 Sample Proportion</b>	<b>Rank of Definition Considering Difference</b>	<b>Correlation with SF-12 measure</b>	<b>Rank of Definition Considering Correlation</b>	<b>Overall Rank</b>
24	0.13365	0.0087	4	0.31709	9	1
2	0.10893	0.0160	14	0.33247	2	2
37	0.12769	0.0028	2	0.29442	21	3
39	0.14224	0.0173	17	0.31155	14	4
52	0.13433	0.0094	6	0.28081	29	5
33	0.13456	0.0097	7	0.27040	33	6
51	0.11603	0.0089	5	0.25872	36	7
9	0.12552	0.0006	1	0.2389	40	7
36	0.10914	0.0158	13	0.27223	32	9
30	0.13923	0.0143	11	0.26745	34	9
7	0.13531	0.0104	8	0.24788	37	9
8	0.13033	0.0054	3	0.23670	42	9
44	0.11363	0.0113	9	0.24012	38	13
21	0.15729	0.0324	33	0.30893	15	14
15	0.16592	0.0410	39	0.31271	11	15
25	0.17340	0.0485	47	0.32552	4	16
3	0.16855	0.0436	44	0.31830	7	16
38	0.15213	0.0272	31	0.29988	20	16
27	0.14404	0.0191	20	0.27713	31	16
47	0.11015	0.0148	12	0.23958	39	16

Source: GSOEP 1984-2002, authors' calculations

B.4: SF-12 questions in the GSOEP 2002 release

Question No.	Question Text	Possible Answers
<b>SP86</b>	How would you describe your current health?	Very good; Good; Satisfactory; Poor; Bad;
<b>SP87</b>	When you ascend stairs, i.e. go up several floors on foot: Does your state of health affect you greatly, slightly or not at all?	Greatly; Slightly; Not at all;
<b>SP88</b>	And what about having to cope with other tiring everyday tasks, i.e. where one has to lift something heavy or where one requires agility: Does your state of health affect you greatly, slightly or not at all?	Greatly; Slightly; Not at all;
<b>SP89</b>	<p>Please think about the last four weeks: How often did it occur within this period of time...</p> <ul style="list-style-type: none"> <li>- 02 that you felt run-down and melancholy?</li> <li>- 03 that you felt relaxed and well-balanced?</li> <li>- 04 that you felt full of energy?</li> <li>- 05 that you had strong physical pains? that due to physical health problems...</li> <li>- 06 - you achieved less than you wanted to at work or in everyday tasks?</li> <li>- 07 - you were limited in some form at work or in everyday tasks? that due to mental health or emotional problems...</li> <li>- 08 - you achieved less than you wanted to at work or in everyday tasks?</li> <li>- 09 - you carried out your work or everyday tasks less thoroughly than usual?</li> <li>- 10 that due to physical or mental health problems you were limited socially, i.e. in contact with friends, acquaintances or relatives?</li> </ul>	<p>For all SP89 questions: Always; Often; Sometimes; Almost never; Never</p>

Source: GSOEP 2002, translations taken from <http://www.diw.de/english/sop/service/index.html>

*Appendix C: Estimation Results*

**Table C.1. Work Limitation Based Disability Prevalence Rates for Working Age Men in the CPS and PSID, one-period sample, 1981-1997**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.11500	0.00573	20.07	<.0001
<b>Time</b>	0.00091	0.00038	2.37	0.0245
<b>CPS</b>	-0.04436	0.00645	-6.88	<.0001
<b>CPS*Time</b>	-0.00054	0.00043	-1.24	0.2244

**Table C.2. Work Limitation Based Disability Prevalence Rates for Working Age Men in the CPS and PSID, two-period sample, 1981-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.07249	0.00379	19.11	<.0001
<b>Time</b>	0.00109	0.00027	4.11	0.0004
<b>CPS</b>	-0.03037	0.00465	-6.53	<.0001
<b>CPS*Time</b>	-0.00084	0.00033	-2.54	0.0172

**Table C.3. Work Limitation Based Disability Prevalence Rates for Working Age Men in the CPS, one- and two-period sample, 1981-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.07378	0.00121	61.13	<.0001
<b>Time</b>	0.00018	0.00010	1.83	0.0750
<b>Two period</b>	-0.03114	0.00193	-16.17	<.0001
<b>(Two period)*Time</b>	0.00021	0.00015	1.34	0.1880

**Table C.4. Work Limitation Based Disability Prevalence Rates for Working Age Men in the PSID, one- and two-period sample, 1976-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.11242	0.00381	29.53	<.0001
<b>Time</b>	0.00122	0.00030	4.08	0.0002
<b>Two period</b>	-0.03629	0.00519	-7.00	<.0001
<b>(Two period)*Time</b>	-0.00034	0.00041	-0.83	0.4125

**Table C.5. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the CPS and PSID, one-period sample, 1980-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.76551	0.02477	30.90	<.0001
<b>Time</b>	-0.00214	0.00177	-1.21	0.2351
<b>CPS</b>	-0.28959	0.02995	-9.67	<.0001
<b>CPS*Time</b>	-0.00174	0.00214	-0.81	0.4217

**Table C.6. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the CPS and PSID, two-period sample, 1981-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.67200	0.03489	19.26	<.0001
<b>Time</b>	-0.00232	0.00242	-0.96	0.3461
<b>CPS</b>	-0.42188	0.04690	-8.99	<.0001
<b>CPS*Time</b>	0.00214	0.00330	0.65	0.5234

**Table C.7. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the CPS, comparing the one-period with the two-period sample, 1981-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.50067	0.01326	37.76	<.0001
<b>Time</b>	-0.00592	0.00077	-7.69	<.0001
<b>Two period</b>	-0.21595	0.02354	-9.17	<.0001
<b>(Two period)*Time</b>	0.00269	0.00136	1.98	0.0555

**Table C.8. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the PSID, comparing the one-period with the two-period sample, 1976-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.76021	0.01689	45.00	<.0001
<b>Time</b>	-0.00177	0.00132	-1.34	0.1888
<b>Two period</b>	-0.10318	0.02605	-3.96	0.0003
<b>(Two period)*Time</b>	0.00043	0.00204	0.21	0.8330

**Table C.9. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and PSID, one-period sample, 1980-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.76745	0.02153	35.64	<.0001
Time	-0.00147	0.00155	-0.95	0.3492
CPS	-0.26464	0.03045	-8.69	<.0001
CPS*Time	-0.00280	0.00219	-1.28	0.2111

**Table C.10. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and PSID, two-period sample, 1981-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.67214	0.03263	20.60	<.0001
Time	-0.00155	0.00229	-0.68	0.5042
CPS	-0.41148	0.04790	-8.59	<.0001
CPS*Time	0.00149	0.00339	0.44	0.6639

**Table C.11. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the PSID, comparing the one-period with the three-period sample, 1976-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.76683	0.01804	42.51	<.0001
Time	-0.00222	0.00139	-1.60	0.1177
Three period	-0.15629	0.02933	-5.33	<.0001
(Three period)*Time	0.00112	0.00225	0.50	0.6213

**Table C.12. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the PSID, comparing the one-period with the four-period sample, 1978-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.76905	0.01949	39.46	<.0001
Time	-0.00237	0.00146	-1.62	0.1148
Four period	-0.19882	0.03308	-6.01	<.0001
(Four period)*Time	0.00201	0.00248	0.81	0.4244

**Table C.13. Employment Rates Among Working Age Men With Work Limitation Based Disabilities, comparing the four-period PSID-sample with the one-period CPS-sample, 1980-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.58470	0.03144	18.60	<.0001
Time	-0.00129	0.00224	-0.57	0.5706
CPS	-0.10878	0.03527	-3.08	0.0044
CPS*Time	-0.00260	0.00252	-1.03	0.3116

**Table C.14. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, PSID, one- and two-period sample, 1976-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.76386	0.01799	42.45	<.0001
Time	-0.00122	0.00143	-0.85	0.3996
CPS	-0.10344	0.02545	-4.06	0.0002
CPS*Time	0.00045	0.00203	0.22	0.8270

**Table C.15. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, PSID, one- and three-period sample, 1977-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.76958	0.02056	37.43	<.0001
Time	-0.00161	0.00160	-1.01	0.3203
CPS	-0.15582	0.02908	-5.36	<.0001
CPS*Time	0.00094	0.00226	0.41	0.6810

**Table C.16. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, PSID, one- and four-period sample, 1978-1996**

	Coefficient	Standard Error	t-value	Pr >  t
Intercept	0.77152	0.02315	33.33	<.0001
Time	-0.00174	0.00175	-0.99	0.3283
CPS	-0.19713	0.03274	-6.02	<.0001
CPS*Time	0.00173	0.00248	0.70	0.4907

**Table C.17. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS one-sample and PSID four-period sample, 1978-1996**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.57439	0.02040	28.15	<.0001
<b>Time</b>	-0.00001134	0.00155	-0.01	0.9942
<b>CPS</b>	-0.07159	0.03258	-2.20	0.0354
<b>CPS*Time</b>	-0.00426	0.00239	-1.78	0.0845

**Table C.18. Work Limitation Based Disability Prevalence Rates for Working Age Men in the GSOEP, comparing the one-period with the two-period sample, 1984-2002**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.10502	0.00384	27.36	<.0001
<b>Time</b>	-0.00070	0.00028	-2.54	0.0162
<b>Two period</b>	-0.02679	0.00534	-5.01	<.0001
<b>(Two period)*Time</b>	0.00048	0.00038	1.26	0.2181

**Table C.19. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the GSOEP, comparing the one-period with the two-period sample, 1984-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.68151	0.02295	29.69	<.0001
<b>Time</b>	-0.00915	0.00167	-5.48	<.0001
<b>Two period</b>	-0.08845	0.03392	-2.61	0.0137
<b>(Two period)*Time</b>	-0.00065	0.00248	-0.26	0.7949

**Table C.20. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, one-period sample, 1983-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.72441	0.02712	26.71	<.0001
<b>Time</b>	-0.00519	0.00152	-3.42	0.0017
<b>CPS</b>	-0.18555	0.03836	-4.84	<.0001
<b>CPS*Time</b>	-0.00171	0.00215	-0.80	0.4318

**Table C.21. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, two-period sample, 1984-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.66034	0.02920	22.62	<.0001
<b>Time</b>	-0.00770	0.00160	-4.82	<.0001
<b>CPS</b>	-0.33963	0.04319	-7.86	<.0001
<b>CPS*Time</b>	0.00333	0.00235	1.42	0.1663

**Table C.22. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, one-period sample, 1983-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.72529	0.09281	7.81	<.0001
<b>Time</b>	-0.00427	0.00763	-0.56	0.5884
<b>CPS</b>	-0.27851	0.13126	-2.12	0.0598
<b>CPS*Time</b>	0.00569	0.01079	0.53	0.6096

**Table C.23. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, two-period sample, 1984-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.64416	0.09378	6.87	<.0001
<b>Time</b>	-0.00564	0.00771	-0.73	0.4827
<b>CPS</b>	-0.38819	0.14114	-2.75	0.0225
<b>CPS*Time</b>	0.00620	0.01143	0.54	0.6010

**Table C.24. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, one-period sample, 1991-2000**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.68672	0.08107	8.47	<.0001
<b>Time</b>	-0.00352	0.00392	-0.90	0.3816
<b>CPS</b>	-0.08845	0.11466	-0.77	0.4517
<b>CPS*Time</b>	-0.00630	0.00554	-1.14	0.2720

**Table C.25. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, two-period sample, 1991-2000**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.52721	0.07340	7.18	<.0001
<b>Time</b>	-0.00144	0.00355	-0.41	0.6895
<b>CPS</b>	-0.11338	0.10409	-1.09	0.2932
<b>CPS*Time</b>	-0.00739	0.00502	-1.47	0.1617

**Table C.26. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS one-period sample, 1980-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.46432	0.00841	55.21	<.0001
<b>Time</b>	-0.00009	0.00142	-0.06	0.9535

**Table C.27. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, GSOEP one-period sample, 1983-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.66858	0.05653	11.83	<.0001
<b>Time</b>	0.00016	0.00820	0.02	0.9853

**Table C.28. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS one-period sample, 1991-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.54292	0.02285	23.76	<.0001
<b>Time</b>	-0.00938	0.00140	-6.70	<.0001

**Table C.29. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, GSOEP one-period sample, 1991-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.67421	0.07034	9.58	<.0001
<b>Time</b>	-0.00389	0.00431	-0.90	0.3907

**Table C.30. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS two-period sample, 1981-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.25976	0.02284	11.37	<.0001
<b>Time</b>	0.00013	0.00361	0.03	0.9733

**Table C.31. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, GSOEP two-period sample, 1984-1990**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.61594	0.06791	9.07	0.0003
<b>Time</b>	-0.00564	0.00933	-0.61	0.5715

**Table C.32. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS two-period sample, 1991-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.34906	0.04268	8.18	<.0001
<b>Time</b>	-0.00735	0.00260	-2.83	0.0222

**Table C.33. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, GSOEP two-period sample, 1991-2001**

	<b>Coefficient</b>	<b>Standard Error</b>	<b>t-value</b>	<b>Pr &gt;  t </b>
<b>Intercept</b>	0.54644	0.05584	9.79	<.0001
<b>Time</b>	-0.00333	0.00342	-0.97	0.3555

*Appendix D: Means and Sample Sizes*

**Table D.1. Work Limitation Based Disability Prevalence Rates for Working Age Men in the CPS and PSID, 1976-2002<sup>34</sup>**

	One-Period Sample				Two-Period Sample			
	CPS		PSID		CPS		PSID	
	Mean	N	Mean	N	Mean	N	Mean	N
<b>1976</b>			0.1030	2851			0.0701	2883
<b>1977</b>			0.1061	2999			0.0721	2998
<b>1978</b>			0.1159	3118			0.0805	3120
<b>1979</b>			0.1282	3242			0.0917	3235
<b>1980</b>			0.1392	3379			0.0935	3321
<b>1981</b>	0.0754	37686	0.1184	3434	0.0450	11292	0.0795	3390
<b>1982</b>	0.0750	34092	0.1181	3506	0.0469	11506	0.0783	3442
<b>1983</b>	0.0715	34620	0.1081	3587	0.0419	11165	0.0773	3511
<b>1984</b>	0.0728	34389	0.1236	3659	0.0442	10657	0.0839	3553
<b>1985</b>	0.0771	34732	0.1196	3734			0.0757	3649
<b>1986</b>	0.0768	34475	0.1193	3803	0.0477	10382	0.0826	3694
<b>1987</b>	0.0759	34115	0.1407	3850	0.0431	10706	0.0928	3713
<b>1988</b>	0.0716	34538	0.1331	3881	0.0426	9952	0.0891	3750
<b>1989</b>	0.0712	32254	0.1268	3903	0.0419	10237	0.0930	3786
<b>1990</b>	0.0738	35348	0.1480	3951	0.0459	11141	0.0997	3840
<b>1991</b>	0.0725	35636	0.1430	3996	0.0428	11063	0.0909	3869
<b>1992</b>	0.0762	35279	0.1333	4120	0.0503	10961	0.0883	3823
<b>1993</b>	0.0799	35016	0.1317	4190	0.0516	10896	0.0875	3929
<b>1994</b>	0.0831	33892	0.1304	4656	0.0492	9986	0.0963	4447
<b>1995</b>	0.0806	33965	0.1296	4610			0.0945	4432
<b>1996</b>	0.0782	29585	0.1322	4589	0.0453	9872	0.0878	3285
<b>1997</b>	0.0779	30164	0.1188	3766	0.0528	10007		
<b>1998</b>	0.0745	30312			0.0493	10129		
<b>1999</b>	0.0760	30545			0.0517	10147		
<b>2000</b>	0.0768	31124			0.0502	10152		
<b>2001</b>	0.0741	30101			0.0504	9709		
<b>2002</b>	0.0764	49653						

**Table D.2. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the CPS and PSID, 1975-2001<sup>35</sup>**

	One-Period Sample				Two-Period Sample			
	CPS		PSID		CPS		PSID	
	Mean	N	Mean	N	Mean	N	Mean	N
<b>1975</b>			0.7674	318				
<b>1976</b>			0.7262	359			0.6309	221
<b>1977</b>			0.7535	387			0.6364	246
<b>1978</b>			0.7731	444			0.6644	267
<b>1979</b>			0.7570	479			0.6530	297
<b>1980</b>	0.4464	2786	0.7262	420			0.6507	304
<b>1981</b>	0.4641	2519	0.7180	400	0.3008	489	0.5933	260
<b>1982</b>	0.4331	2457	0.6859	399	0.2127	533	0.5885	262
<b>1983</b>	0.4154	2470	0.7232	441	0.2224	467	0.5927	266
<b>1984</b>	0.4181	2523	0.7641	443	0.2270	443	0.6783	271
<b>1985</b>	0.4408	2545	0.7581	410			0.6710	252
<b>1986</b>	0.4517	2488	0.7832	491	0.2752	465	0.6602	273
<b>1987</b>	0.4461	2399	0.7997	490	0.2648	449	0.7239	313
<b>1988</b>	0.4436	2259	0.7631	499	0.2461	420	0.6976	314
<b>1989</b>	0.4604	2496	0.7905	514	0.2781	419	0.6855	326
<b>1990</b>	0.4333	2515	0.7453	521	0.2254	493	0.6743	332
<b>1991</b>	0.4250	2605	0.7339	536	0.2303	472	0.6546	337
<b>1992</b>	0.4293	2679	0.7372	533	0.2591	516	0.6380	329
<b>1993</b>	0.3820	2603	0.7180	619	0.2780	537	0.6333	324
<b>1994</b>	0.3905	2579	0.6687	597	0.2070	467	0.5704	417
<b>1995</b>	0.3592	2213	0.6799	581			0.5641	395
<b>1996</b>	0.3950	2281	0.7162	418	0.2559	446	0.6043	249
<b>1997</b>	0.3629	2149			0.2022	496		
<b>1998</b>	0.3517	2190			0.1905	468		
<b>1999</b>	0.3506	2324			0.1866	486		
<b>2000</b>	0.3388	2187			0.1792	512		
<b>2001</b>	0.3346	3419			0.2056	470		

**Table D.3. Employment Rates Among Working Age Men Without Work Limitation Based Disabilities in the CPS and PSID, 1975-2001<sup>36</sup>**

	One-Period Sample				Two-Period Sample			
	CPS		PSID		CPS		PSID	
	Mean	N	Mean	N	Mean	N	Mean	N
1975			0.9873	2533				
1976			0.9841	2640			0.9827	2662
1977			0.9928	2731			0.9908	2752
1978			0.9896	2798			0.9880	2853
1979			0.9960	2900			0.9936	2938
1980	0.9585	34900	0.9913	3014			0.9915	3017
1981	0.9539	31573	0.9923	3106	0.9676	10803	0.9919	3130
1982	0.9406	32163	0.9826	3188	0.9549	10973	0.9812	3180
1983	0.9374	31919	0.9808	3218	0.9512	10698	0.9790	3245
1984	0.9471	32209	0.9844	3291	0.9580	10214	0.9840	3282
1985	0.9460	31930	0.9866	3393			0.9834	3397
1986	0.9510	31627	0.9811	3359	0.9617	9917	0.9806	3421
1987	0.9485	32139	0.9813	3391	0.9633	10257	0.9828	3400
1988	0.9490	29995	0.9864	3404	0.9588	9532	0.9839	3436
1989	0.9656	32852	0.9838	3437	0.9674	9818	0.9836	3460
1990	0.9629	33121	0.9891	3475	0.9607	10648	0.9855	3508
1991	0.9582	32674	0.9820	3584	0.9571	10591	0.9827	3532
1992	0.9524	32337	0.9770	3657	0.9483	10445	0.9756	3494
1993	0.9489	31289	0.9774	4037	0.9525	10359	0.9737	3605
1994	0.9513	31386	0.9798	4013	0.9463	9519	0.9783	4030
1995	0.9503	27372	0.9834	4008			0.9821	4037
1996	0.9524	27883	0.9807	3348	0.9495	9426	0.9799	3036
1997	0.9563	28163			0.9521	9511		
1998	0.9558	28355			0.9548	9661		
1999	0.9561	28800			0.9494	9661		
2000	0.9563	27914			0.9526	9640		
2001	0.9489	46234			0.9466	9239		

**Table D.4. Employment Rates Among Working Age Men With Work Limitation Based Disabilities in the PSID, one-, two-, three-, and four-period samples, 1975-1996<sup>37</sup>**

	One Period		Two Periods		Three Periods		Four Periods	
	Mean	N	Mean	N	Mean	N	Mean	N
<b>1975</b>	0.7674	318						
<b>1976</b>	0.7262	359	0.6309	221				
<b>1977</b>	0.7535	387	0.6364	246	0.5983	175		
<b>1978</b>	0.7731	444	0.6644	267	0.5889	197	0.5555	142
<b>1979</b>	0.7570	479	0.6530	297	0.5949	210	0.5396	160
<b>1980</b>	0.7262	420	0.6507	304	0.6138	220	0.5448	164
<b>1981</b>	0.7180	400	0.5933	260	0.5730	223	0.5776	176
<b>1982</b>	0.6859	399	0.5885	262	0.5434	199	0.5206	179
<b>1983</b>	0.7232	441	0.5927	266	0.5378	205	0.4953	161
<b>1984</b>	0.7641	443	0.6783	271	0.6353	190	0.6171	156
<b>1985</b>	0.7581	410	0.6710	252	0.6398	193	0.6056	142
<b>1986</b>	0.7832	491	0.6602	273	0.5827	197	0.5606	157
<b>1987</b>	0.7997	490	0.7239	313	0.6634	212	0.6210	157
<b>1988</b>	0.7631	499	0.6976	314	0.6612	238	0.5975	174
<b>1989</b>	0.7905	514	0.6855	326	0.6537	245	0.6106	197
<b>1990</b>	0.7453	521	0.6743	332	0.6147	238	0.5883	188
<b>1991</b>	0.7339	536	0.6546	337	0.6508	254	0.6352	187
<b>1992</b>	0.7372	533	0.6380	329	0.5877	246	0.5795	191
<b>1993</b>	0.7180	619	0.6333	324	0.5970	239	0.5714	186
<b>1994</b>	0.6690	600	0.5704	417	0.5298	255	0.5085	194
<b>1995</b>	0.6799	581	0.5641	396	0.5454	317	0.5312	205
<b>1996</b>	0.7162	418	0.6043	249	0.5262	189	0.4818	162

**Table D.5. Work Limitation Based Disability Prevalence and Employment Rates for Working Age Men in the GSOEP, 1983-2002**

	Prevalence Rates				Employment Rates			
	One-Period Sample		Two-Period Sample		One-Period Sample		Two-Period Sample	
	Mean	N	Mean	N	Mean	N	Mean	N
<b>1983</b>					0.5911	291		
<b>1984</b>	0.1088	2789	0.0827	2483	0.5916	249	0.5161	196
<b>1985</b>	0.1004	2561	0.0787	2339	0.5990	208	0.5320	175
<b>1986</b>	0.0880	2451	0.0696	2294	0.7061	227	0.5360	159
<b>1987</b>	0.1001	2424	0.0826	2226	0.6690	216	0.6121	164
<b>1988</b>	0.1085	2301	0.0834	2145	0.6007	205	0.5547	161
<b>1989</b>	0.1045	2255	0.0728	2101	0.6072	174	0.5061	130
<b>1990</b>	0.0897	2207	0.0711	2087	0.5734	175	0.4697	124
<b>1991</b>	0.0983	2209	0.0817	2078	0.5773	172	0.4813	132
<b>1992</b>	0.0940	2170	0.0671	2065	0.5689	169	0.4258	116
<b>1993</b>	0.0887	2196	0.0657	2066	0.5733	192	0.4681	122
<b>1994</b>	0.0985	2196	0.0709	2086	0.5296	174	0.4567	133
<b>1995</b>	0.0997	2179	0.0753	2071	0.5273	188	0.4209	140
<b>1996</b>	0.1054	2134	0.0784	2017	0.4571	155	0.4054	129
<b>1997</b>	0.0919	2098	0.0827	1947	0.5167	188	0.3698	115
<b>1998</b>	0.0911	2488	0.0773	2262	0.6039	176	0.4646	132
<b>1999</b>	0.0960	2331	0.0806	2162	0.5133	366	0.4312	123
<b>2000</b>	0.0846	4872	0.0698	4101	0.4837	324	0.4256	241
<b>2001</b>	0.0908	4227	0.0736	3794	0.4940	306	0.3780	229
<b>2002</b>	0.0900	3931						

**Table D.6. Employment Rates Among Working Age Men Without Work Limitation Based Disabilities in the GSOEP, 1983-2001**

	One-Period Sample		Two-Period Sample	
	Mean	N	Mean	N
<b>1983</b>	0.9264	2498		
<b>1984</b>	0.9296	2312	0.9290	2287
<b>1985</b>	0.9211	2243	0.9268	2164
<b>1986</b>	0.9210	2197	0.9229	2135
<b>1987</b>	0.9241	2085	0.9273	2062
<b>1988</b>	0.9195	2050	0.9206	1984
<b>1989</b>	0.9193	2033	0.9182	1971
<b>1990</b>	0.9136	2034	0.9195	1963
<b>1991</b>	0.9190	1998	0.9175	1946
<b>1992</b>	0.9044	2027	0.9065	1949
<b>1993</b>	0.8765	2004	0.8868	1944
<b>1994</b>	0.8603	2005	0.8695	1953
<b>1995</b>	0.8746	1946	0.8704	1931
<b>1996</b>	0.8614	1943	0.8700	1888
<b>1997</b>	0.8434	2300	0.8455	1832
<b>1998</b>	0.8603	2155	0.8470	2130
<b>1999</b>	0.8474	4506	0.8709	2039
<b>2000</b>	0.8574	3903	0.8543	3860
<b>2001</b>	0.8415	3625	0.8436	3565

**Table D.7. Ratio of Employment Rates for Work-Limited Men Over the Employment Rates for Non-Work-Limited Men, CPS and GSOEP, one-period and two-period sample means, 1980-2001**

	One-Period Sample		Two-Period Sample	
	CPS	GSOEP	CPS	GSOEP
<b>1980</b>	0.4657			
<b>1981</b>	0.4866		0.3109	
<b>1982</b>	0.4605		0.2227	
<b>1983</b>	0.4432	0.6381	0.2339	
<b>1984</b>	0.4414	0.6364	0.2369	0.5555
<b>1985</b>	0.4660	0.6503		0.5741
<b>1986</b>	0.4749	0.7667	0.2861	0.5808
<b>1987</b>	0.4703	0.7239	0.2749	0.6600
<b>1988</b>	0.4674	0.6533	0.2567	0.6026
<b>1989</b>	0.4768	0.6605	0.2874	0.5511
<b>1990</b>	0.4500	0.6276	0.2346	0.5109
<b>1991</b>	0.4436	0.6282	0.2407	0.5245
<b>1992</b>	0.4507	0.6290	0.2732	0.4698
<b>1993</b>	0.4025	0.6541	0.2919	0.5278
<b>1994</b>	0.4105	0.6156	0.2187	0.5252
<b>1995</b>	0.3780	0.6029		0.4836
<b>1996</b>	0.4148	0.5306	0.2695	0.4660
<b>1997</b>	0.3794	0.6126	0.2124	0.4373
<b>1998</b>	0.3679	0.7019	0.1995	0.5485
<b>1999</b>	0.3667	0.6058	0.1965	0.4951
<b>2000</b>	0.3543	0.5641	0.1882	0.4981
<b>2001</b>	0.3526	0.5871	0.2172	0.4481

## Endnotes

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1. See similar findings in: Acemoglu and Angrist, 2001, Bound and Waidmann, 2002, Burkhauser, Daly, and Houtenville, 2001, and DeLeire, 2000.
2. See Stapleton and Burkhauser (2003) for a discussion of these criticisms.
3. We focus on men, since their employment decline is much more pronounced than that of women. But there is also a significant decline in the employment of women with disabilities relative to women without disabilities in the 1990s.
4. In principle, a longitudinal analysis considering short- and longer-term disability is also possible in the Survey of Income and Program Participation (SIPP), but measurement problems (see Maag and Wittenburg, 2003) and survey length (maximum of four years) favor the PSID for this analysis.
5. Bureau of Labor Statistics and Statistisches Bundesamt (German Federal Bureau of Statistics).
6. Note that in the following, we will use the terms “disability”, “work limitation”, interchangeably to ease the flow of reading. Importantly, one can still have a work limitation and be able to work.
7. Major changes in NHIS questions after 1996 prevent comparisons with earlier years or with current questions in the CPS and PSID.
8. See appendix A for the exact changes and implications in the PSID.
9. The workers mainly from southern European countries (Italy, Greece, Spain), who were employed during the 1960s in Germany to offset the shortage of labor, were called “Guest Workers”.
10. These are the GSOEP sub-samples A, E, and F, restricted to the sample region 1, i.e. West Germany.
11. See appendix B.1 for a discussion on the German disability registration system.
12. The question is asked of new entrants to the GSOEP in 1986, but not asked at all in 1990 and 1993.
13. See appendix B.2 for exact figures for all available years.
14. The SOEP does directly provide information about previous year’s hours, but imputations are made for the Cross National Equivalent File (CNEF) using employment information

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from a calendar file. As the CPS and the PSID also use multiple information sources to infer the number of hours worked in the previous year, we use the CNEF information here.

See <http://www.human.cornell.edu/units/pam/gsoep/equiv/g-equiv1.pdf> for more information on the CNEF.

15. It would be possible to take the more accurate information from the following year ( $t+2$ ), but since this requires a matching process the sample size in the CPS would be reduced dramatically (see the tables in Appendix D for sizes of the different samples).
16. All estimation results are given in Appendix C.
17. The estimates are weighted with the inverse of their standard error.
18. See Appendix D for exact sample sizes of all samples.
19. Note that the level of significance is 5 percent unless noted otherwise. The time trends estimated ( $\beta_0$  and  $\beta_{CPS}$ ) are not statistically different from zero in the one-period setting, and, although they are statistically different from zero in the two-period setting, they are very small. This suggests, quite intuitively, that the population with work limitation based disabilities is relatively constant over time (as measured in both datasets).
20. See Figure 10 for a comparison of employment rates of the male population without work limitations in the PSID and CPS.
21. An exception is the increase in the PSID series in 1984 – a finding that can be contributed to improvements in data collection methods, see Appendix A.
22. Note, however, that the coefficient for the CPS two-period time trend is significant at the 10 percent level.
23. Using the same methods discussed above, we find no significant differences in relative employment trends between the CPS and the PSID.
24. Although this leads to a decrease in sample size, we still have more than 140 observations for each year of our analysis, see Appendix D, Table D.4.
25. In the years 1986, 1990, and 1993 the relatively strict rules for imputing values as mentioned above may lead to estimates that are too low, especially in the one-period sample.
26. Specifically, in the later years the two-period sample makes up 80 percent of the one-period sample in the GSOEP, whereas in the PSID and the CPS, the value is never higher than 74 percent and 68 percent, respectively. This could be because in the German data, the registration with the pension's office requires an applicant to be disabled at least for six months, thereby reducing the number of observed short-term work limitations.

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27. In our previous analysis, we showed that with regard to trends in employment, the CPS and the PSID could be used interchangeably. Since the CPS gives us five extra data points for our analysis, we use it for comparison with the GSOEP.
  28. See appendix Tables D.5 and D.7 for the exact values of relative employment.
  29. Note however, that the use of a regression analysis is questionable in the light of the few observations available, especially for the GSOEP data in the 1980s, as these are only seven (eight) data points for the two-period (one-period) samples.
  30. The years 1985 and 1995 are missing for the CPS two-period series since the matching process is not possible for the years 1985-1986 and 1995-1996.
  31. These figures are the maximum number of questions possible. Individuals may answer less due to filtering in the process of the interview.
  32. This probably does not affect yes"/ "no" variables like a work limitation. It might be more important for the accuracy of continuous measures, e.g. hours of work. Specifically, the PSID uses the so-called "event dating" procedure since 1984, which allows for a detailed employment history. This leads to more accuracy: "[...] the work hours and employment histories were cross-checked for inconsistencies and interviews were returned to the field for the resolution of the discrepancies. Thus, information on annual work hours is probably slightly more accurate than in the past." (PSID 1986).
  33. See appendix B.4 for the SF-12 questions asked in wave 19 (2002) of the GSOEP.
  34. Data for 1985 and 1995 are missing in the CPS two-period sample, since the matching process is not possible for 1985-1986 and 1995-1996. Note that we already took account of the problems encountered in the PSID, and only show the reduced sample as described in appendix A.
  35. See notes on Table D.1. The PSID one-period sample has the starting year 1975, since employment information asked in 1976 is valid for that year. Similarly, the CPS one-period sample starts in 1980.
  36. See notes on Table D.1 and D.2.
  37. See notes on Table D.1 and D.2.