Self-employment among people with work limitations and disabilities in the US, 1988-2009

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Abstract

This paper examines self-employment rates among workers with work limitations and disabilities in the US. Using data from the Current Population Survey, we show that, during the 1989-2009 period, those with work limitations were more likely to be self-employed in unincorporated businesses than their counterparts without work limitations. The result is consistent with recent empirical evidence from European countries (Boylan & Burchardt, 2002; Jones & Latreillet, 2011; Pagán-Rodríguez, 2009, 2011a). Additionally, the results show that the relationship between the probability of being self-employed and having a work limitation is not uniform: the self-employment gap increase with education and age. Overall, the evidence appears to favor the view that, for those with work limitations, self-employment is a voluntary choice driven by non-monetary motives. Compared to standard jobs, self-employment may provide a better accommodation of health problems by offering the flexibility of choosing location, environment, and hours of work.

Introduction

People with disabilities are considerably less likely to be employed than people without disabilities. As will be shown in the article, between 1988 and 2009, the employment rate of people with work limitations ages 25 to 64 has declined from 27 percent to 17 percent, while staying at about 78 percent for people without limitations. The growing unemployment of people with disabilities carries considerable social costs. During the period from 1985 to 2005, the share of individuals ages 25 to 64 receiving Disability Insurance (DI) benefits has increased from 2.2 percent to 4.1 percent (Autor & Duggan, 2003). In addition to the loss of economic self-sufficiency, involuntary unemployment among people with disabilities may negatively effect their well-being.

The labour situation of people with disabilities has increasingly become a point of interest among policy makers and researchers. To better understand incentives and disincentives facing people with disabilities in the labor market, it is important to consider the nature and type of employment they undertake. One particular employment option that received little attention in the literature is self-employment. Yet recent evidence suggests that self-employment is an important source of paid work for people with disabilities. Studies by Boylan & Burchardt (2002), Pagán-Rodríguez (2009), Jones & Latreillet (2011), and Pagán-Rodríguez (2011a) show that self-employment rates are higher among people with disabilities compared to their non-disabled counterparts. All these studies, however, are based on data from European countries — Boylan & Burchardt (2002) use the 2000-2001 Labour Force Survey (LFS) and the 1998-2000 Family Resources Survey from the UK; Jones & Latreillet (2006) use the 2003 LFS, Pagán-Rodríguez (2009) use data from the European Community Household Panel for the period 1995–2001 for 13 European countries, and Pagán-Rodríguez (2011b) uses the 2004 and 2007 Survey of Health, Aging and Retirement in Europe.

Surprisingly little is known about self-employment among persons with disabilities in the US. This study is the first to our knowledge to systematically study self-employment among persons with disabilities in the US. For the analysis we use cross-sectional data from the 1989-2009 March Current Population Survey (CPS), a large-scale nationally representative survey of the US non-institutional population. These data suit perfectly to study the relationship between self-employment and disability. First of all, since the likelihoods of being self-employed and of having a disability are relatively small, the large sample size of the CPS data is essential. Second, the rich set of demographic and socioeconomic variables available in the CPS permits a comprehensive multivariate analysis.

In addition to documenting the self-employment differential using nationally representative data, the paper contributes to the literature in three important ways. First, compared to the previous studies we use a substantially longer time period, which allows us to see the time trend in the self-employment gap. Second, we investigate whether the self-employment gap varies across demographic characteristics such as age, education and race. This information is essential for understanding the reasons behind the self-employment disparities between those with and without disabilities. Finally, to identify persons with disabilities, two types of measures are used: one is based on the question about work limitations and available in all years and the other, potentiality more objective, is derived from the questions on physical and cognitive impairments which were introduced to the CPS in 2008. As will

be discussed below, disability measures are likely to be affected by reporting error, which may bias estimates. Using different disability measures can give a better understanding behind the relationship between disability and self-employment.

To preview the results, we find that self-employment rates in unincorporated businesses of people with work limitations are substantially higher compared to those of people without work limitations. Thus during the study period, unadjusted self-employment rates of workers aged 25 to 64 with work limitations are 4 to 8.8 percentage points higher than those of workers without work limitations. Adjusted for various factors including demographic and socioeconomic, the gap is slightly smaller (between 3 and 5 percentage points) but remains strongly statistically significant. Between 1989 and 2009, the self-employment differential between those with and without work limitations remains roughly constant with some increase toward the end of the period.

The finding that self-employment rates are higher among those with disabilities in the US is consistent with recent empirical evidence from other countries (Boylan & Burchardt, 2002; Pagán-Rodríguez, 2009; Jones & Latreillet, 2011; Pagán-Rodríguez, 2011a). A new and important finding that emerges from our analysis is that the self-employment gap is not uniform. In particular, we find that the gap increase with education and age, i.e. being older and having more education are associated with a relatively higher increase in the self-employment rate among people with work limitations, as compared to people without work limitations. Given the fact that these are relatively advantaged groups who less likely to experience employer discrimination, the evidence lends additional support to the view that self-employment is a voluntary choice for at least some people with work limitations.

Finally, using potentially more objective measures on physical and cognitive limitations, the study finds that the self-employment rates vary strongly across disability types and that the self-employment gap is generally smaller compared to that obtained using the work limitation measure. Two disability types that have the strongest positive association with self-employment are lower and upper mobility impairments such as difficulties walking or climbing stairs and difficulties dressing or bathing. In particular, having a difficulty walking or climbing stairs — the most prevalent disability type in the study sample — is related to an increase in the self-employment rate of 4.9 percentage points for men and 4.2 percentage points for women.

The rest of the paper is organized as follows. The next section describes data and methodology. Then the results of the analysis are presented. The last section provides summary and discusses possible causes of the higher self-employment rate among workers with work limitations/disabilities.

Related literature

Why do some people decide to become self-employed? The growing empirical literature finds that this decision is linked to a number of factors. Among these are the expected self-employed to employee earnings differential (Rees & Shah (1986); Hamilton (2000); Taylor (1996)); non-monetary factors such as flexibility of choosing work hours and location, and job autonomy (Fuchs (1982); Taylor (1996); Hamilton (2000); Lombard (2001)); access to capital (Evans & Jovanovic, 1989; Fairlie & Krashinsky, 2006; J. Zissimopoulos et al., 2009); the labor market conditions, such as unemployment (Evans & Leighton, 1989; Schuetze, 2000) and discrimination (Moore, 1983; Borjas, 1986; Borjas & Bronars, 1989;

Fairlie & Meyer, 1996; Fairlie, 1999); government policy affecting tax law and generosity of social programs (Blau, 1987; Schuetze, 2000; Bruce, 2002); health insurance (Gruber & Poterba, 1994; Hamilton, 2000; Wellington, 2001; Fairlie et al., 2011; Velamuri, 2011); family background and, in particular, parental self-employment status (Taylor, 1996; Dunn & Holtz-Eakin, 2000; Hout & Rosen, 2000). [1]

The relationship between self-employment and health has received relatively little attention in the literature. In particular, the majority of current evidence on self-employment among people with disabilities comes from studies employing data from European countries. Thus, using data from the UK, the 2000-2001 Labour Force Survey (LFS) and the 1998-2000 Family Resources Survey, Boylan & Burchardt (2002) have shown that the disabled men are about 4 percent and women about 2 percent more likely to be self-employed than their non-disabled counterparts. Jones & Latreillet (2011) who utilize the LFS from 2003, find that 21 percent of employed disabled (work limited) men are self-employed, compared to 17 percent of workers without disabilities and those without work limitations; the corresponding figures for females are 9 percent and 6-7 percent, respectively. The authors discuss three possible explanations for the relatively higher self-employment rates among workers with disabilities: a voluntary choice due to accommodating flexibility of choosing hours and work location, employer discrimination, and income eligibility requirements imposed by disability income programs (Jones & Latreillet, 2011).[2] While qualitative evidence based on interviews with the disabled self-employed in Boylan & Burchardt (2002) reveals employer discrimination as an often cited reason for becoming self-employed, evidence found in Jones & Latreillet (2011) seem to favor the voluntary choice explanation.

The similar relationship between self-employment and disability is found in other European countries. Thus Pagán-Rodríguez (2009), who uses data from the European Community Household Panel for the period 1995-2001 for 13 European countries, finds that people with disabilities were more likely to be self-employed than people without disabilities. He also reports that the levels of satisfaction with job, type of job and working conditions of self-employed disabled people are higher than those reported by disabled employees (Pagán-Rodríguez, 2009). The satisfaction differential, however, is comparable to that of workers without disabilities, who also report more satisfaction when self-employed. (Pagán-Rodríguez, 2011a).

The empirical evidence on the relationship between self-employment and disability in the US is scarce. One notable exception is Blanck et al. (2000), a case study of Iowa's Entrepreneurs with Disabilities Program (EWD). Based on interviews with disabled entrepreneurs, the study provides evidence of employment discrimination experienced by people with disabilities and suggests that self-employment increases work opportunities for the disabled.

A few related but ultimately addressing other research topics studies have noticed that disability may play a role in the decision to become self-employed (Fairlie, 1999; Schur, 2003; Karoly & Zissmopoulos, 2004; J. M. Zissimopoulos & Karoly, 2007). Thus, while studying part-time employment with data from the CPS and the Survey of Income Participation

[1] For fuller reviews of empirical literature on self-employment see Le (1999) and Blanchflower (2004).

[2] These explanations have been also proposed for the higher concentration of workers with disabilities in non-standard work arrangements, including independent contracting and part-time and temporary employment (Schur, 2002, 2003; Hotchkiss, 2004b).

(SIPP), Schur (2003) finds that among the working-age population (age 18-64), persons with disabilities are more likely to be self-employed than are those without disabilities. Focusing on racial differences in self-employment rates and using the 1980 and 1990 Censuses data, Fairlie & Meyer (1996) find that having a disability increases the probability of self-employment. Using data from the Health and Retirement Study (HRS), J. M. Zissimopoulos & Karoly (2007) examines the determinants of transitions to self-employment from wage and salary work among older workers age 51-67. Their results show that, in addition to factors such as being wealthier, older, male, white, married and higher educated, having a work limiting condition plays a positive role in the transition to self-employment.

The goal of the paper is to fill the gap in the literature and to document the relationship between the probability of self-employment and disability in the US using nationally representative data from the CPS for the 1989-2009 period. In the analysis, the primary disability measure is the work limitation measure, and the main analytic question is whether people with work limitations are more likely to be self-employed compared to their counterparts without work limitations. In addition, the paper investigates how the self-employment gap varies across key demographic variables, such as age, education, and marital status, an important element for understanding the mechanism behind the self-employment disparity. We take a further exploratory look at the relationship between disability type and self-employment by using recently available in the CPS disability measures based on questions about physical and cognitive impairments.

Data and empirical strategy

The analysis uses the annual cross-sectional data from the 1988-2009 March Current Population Survey (CPS). The CPS is a large-scale nationally representative survey of the US non-institutional population, which provides official statistics on employment and self-employment. In addition, the data from the March CPS include information on disability, demographics, socio-economic status and location measures.

The analysis focuses on working-age (ages 25 to 64) civilian individuals who are currently employed. The current employment status is determined with the following question: "Last week, did you do any work for (either) pay (or profit)?" The outcome variable, whether a person is self-employed or a wage and salary worker, is derived from the question which asks about class of employment: "Were you employed by a government, by a private company, a nonprofit organization, or were you self-employed (or working in a family business)?" Respondents who answer "self-employed" are asked additionally: "Is this business incorporated?", which allows to distinguish between self-employed in incorporated and unincorporated businesses.

There are two types of disabilities questions in the March CPS, one asking about work limitations and another about physical and cognitive impairments, both of which are employed in the analysis. Since the work limitation question – " 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?)" – has been asked in all years over the study period, this measure is used in most of the analysis. While the work limitation measure has been widely used in the economic literature to study employment of people with disabilities (Bound & Waidmann, 1992; Acemoglu & Angrist, 2001; Bound & Waidmann, 2002; Burkhauser et al., 2002; Autor & Duggan, 2003;

Hotchkiss, 2004a,b), there have been some concerns about its validity. In particular, it has been criticized as inadequate for identifying persons with disability: too broad that it may include persons without a disability, on the one hand, and too narrow that it may exclude some disabled people, on the other hand (Hale, 2001). For example, the non-disabled with temporary illnesses or conditions such as flu or a broken leg may answer affirmatively to this question. At the same time, people with disabilities but without work limitations will be identified as non-disabled (Hale, 2001).

To address this issue, in addition to the work limitation indicator, the analysis uses potentially more objective and accurate measures of disability, which are relatively recent and have been available in the monthly March CPS since June 2008. These six measures aim to identify 1) a hearing impairment ("Is ... deaf or does ... have serious difficulty hearing?"), 2) a vision impairment ("Is ... blind or does ... have serious difficulty seeing even when wearing glasses?"), 3) a cognitive impairment ("Because of a physical, mental, or emotional condition, does ... have serious difficulty concentrating, remembering, or making decisions?"), 4) a lower mobility impairment ("Does ... have serious difficulty walking or climbing stairs?"), 5) an upper mobility impairment ("Does ... have difficulty dressing or bathing?"), and 6) a daily activity limitation ("Because of a physical, mental, or emotional condition, does ... have difficulty doing errands alone such as visiting a doctor's office or shopping?"). Respondents who report any of the six limitations are classified as having disabilities.

The paper uses descriptive, bivariate and multivariate analysis to investigate the relationship between self-employment rates and work limitation/disability status.

The multivariate analysis is based on the following logistic model

$$P(SE_{i,t} = 1|WL_{i,t}, \mathbf{Z}'_{i,t}) = \Lambda(\beta\, WL_{i,t} + \mathbf{Z}'_{i,t}\mathbf{\Gamma}) = \frac{e^{\beta\, WL_{i,t} + \mathbf{Z}'_{i,t}\mathbf{\Gamma}}}{1+e^{\beta\, WL_{i,t} + \mathbf{Z}'_{i,t}\mathbf{\Gamma}}} \quad (1)$$

where $SE_{i,t}$ is a dummy indicator of whether individual i is self-employed or not, WL is a dummy variable equal to one if the individual reports a work limitation and zero otherwise. A vector of additional controls, $\mathbf{Z}_{i,t}$, includes year dummies, age, race, marital status, education and geographic region.

Results

Employment rates

We begin by calculating employment rates of people with and without work limitations during the period between 1988 and 2009. Table 1 shows total numbers, numbers of employed, and employment rates for those with and without work limitations. Consistent with the well documented trend of declining labor force participation among people with disabilities (Stapleton & Burkhauser, 2003; Burkhauser & Houtenville, 2006), the employment rate among the work limited persons age 25-64 drops from 27.1 percent in 1988 to 16.7 percent in 2009 — a 10.4 percentage point decrease. In contrast, the employment rate of their counterparts without work limitations is virtually flat at 77.9 percent in 1988 and 77.7 percent in 2009. Among people with work limitations, this dramatic decrease in the employment rate is a result of a 47 percent increase in the overall size of the group as well as a 9 percent decline in the number of employed.

Self-employment rates and their time trend

Self-employment in unincorporated businesses. For two work limitation groups, Table 2 reports the estimated numbers of non-agricultural workers ages 25-64, and the number and percent self-employed in unincorporated and incorporated businesses. The substantially higher self-employment rate in unincorporated businesses among workers with work limitations is a prominent feature of the table. During the period, ranging from the lowest level of 10.8 percent in 2002 to the highest level of 15.5 percent in 2005, self-employment rates of workers with work limitations are 3.4-8.8 percentage points higher than those of workers without such limitations, which vary from 6.5 percent in 2009 to 8.2 percent in 1991. The differences is self-employment rates are statistically significant at the 0.01 level in all years.

To help visualize the self-employment dynamics, Figure 1 plots self-employment rates in unincorporated businesses for two work limitation groups. As can be seen in Figure 1, self-employment rates of those with and without work limitations follow rather different time trends. Thus, for persons with no work limitation, self-employment rates show an almost continuous decline throughout the period. From its pick of 8.2 percent in 1991, the self-employment rate of persons without work limitations dropped to 6.6 percent in 2002, rebounded slightly in 2003-2005 (7.1-7.2 percent) and then fell to 6.5 percent in 2009, with an overall decline of 23 percent between 1988 and 2009.

In contrast, for those with work limitations, the time trend of self-employment rates in unincorporated businesses appears to follow a U-shaped pattern. Thus, between 1990 and 2002, the rate had decreased from 14.8 percent to 10.8 percent. Starting in 2003, however, the rate goes up reaching its maximum of 15.5 percent in 2007 and ends up at 15.3 percent in 2009. It should be noted, however, that the analysis of the time trend in self-employment among those with work limitations is complicated by the higher year-to-year variability of estimates of self-employment rate among those with work limitations, which is partly due to the smaller sample size of the group. Yet, even if the unusually high observations of 2007 and 2009 are excluded, the self-employment rate of workers with limitations appears still to be increasing since 2002.

Self-employment in incorporated businesses. Compared to self-employment rates in unincorporated businesses, self-employment rates in incorporated businesses show a rather different picture (see Table 2). First of all, for both disability groups, the self-employment rates in incorporated businesses are substantially lower than those in unincorporated businesses —only about 2 to 4 percent of respondents report being self-employed in incorporated businesses during the period. Second, and in contrast to self-employment in unincorporated businesses, rates are lower for those with work limitations in all years except 2004 and 2006. The differences, however, are rather small ranging from 0.3 to 1.3 percent and often not statistically significant. Finally, whereas self-employment in unincorporated businesses tends to decline during the period, self-employment rates in incorporated businesses show some increase. In particular, among workers without work limitations, the rates increased from 3.2 percent in 1988 to 4.3 percent in 2009. Similarly among those with work limitations, the rates increased from 1.9 percent to 3.4 percent.

To summarize, during the 1988 - 2009 period, self-employment rates in unincorporated businesses are substantially higher among workers with work limitations, with the difference varying from 3.4 to 8.8 percentage points. While self-employment rates among those without

work limitations show an unambiguous decline during the period, the time trend of the self-employment rate of workers with limitations is less clear and may possibly be described as U-shaped, reaching its highest levels at the end of the period. In contrast to self-employment in unincorporated businesses, self-employment rates in incorporated business of workers with work limitations are comparable to those of workers with no work limitations, and show a moderate increase over time.

Bivariate analysis

Table 3 shows characteristics of workers with and without work limitations for three employment sectors: unincorporated self-employment, incorporated self-employment, and wage and salary. Self-employment rates in unincorporated businesses by work limitation status, gender and selected characteristics are reported in Table 4. A number of observations emerge from the results. First, the self-employment gap in unincorporated businesses holds across groups defined by gender, age, race, marital status, education and region. Second, the positive relationship between age and self-employment becomes even stronger among those with work limitations. Finally, education appears to have a positive effect on the self-employment rate of those with work limitations.

Age. Age is clearly a confounding factor in the relationship between self-employment and work limitation. As Table 3 shows both the self-employed and those with work limitations tend to be older. Yet, age cannot fully explain the self-employment gap between those with and without work limitations, as the self-employment gap remains with controls for each of the three age categories: 25-39, 40-49 and 50-64 (see Table 4). Furthermore, the self-employment gap increases strongly with age. In particular, the age increase in self-employment rates among those with work limitations (from 8.9 percent for the ages 25 to 39 to 16.2 percent for the ages 50 to 64) is about twice the corresponding increase of their not work limited counterparts , which suggests a possibility of an interaction between age and work limitation.

Race. Table 3 shows substantial race differences among the employment sectors. In particular, the fraction of blacks is much lower in both self-employment sectors. This is consistent with the well-documented racial gap in self-employment (**?**). However, within each sector, race distributions are quite similar for those with and without work limitations – race differences are not statistically significant for self-employed and significant at the 5 percent level for wage and salary workers.

Table 4 shows that, among the six gender/race groups, differences in self-employment rates between those with and without work limitations are the strongest for men of white and other races. In particular, self-employment rate differences for men of white and other rates are a 6.8 and 7.8 percent, respectively, compared to 2.8-5.2 percent differences for other gender/race groups, which seems to further exacerbate the racial gap in self-employment among men with work limitations.

Marital status. While people with work limitations are more likely than their not work limited counterparts to be single, self-employed are more likely than employees to be married. Among those with work limitations, the share of married is 61.6 percent

in unincorporated self-employment and 49.9 percent in the wage and salary sector. Self-employed in incorporated businesses in both work limitation groups tend to have the highest rates of being married. Here, the share of married is 71.2 percent and 81.8 percent for those with and without work limitations correspondingly. Because of this opposite relationship between marital status and self-employment and marital status and work limitation, the self-employment gap between those with and without work limitations, that does nor account for marital status, may be biased down.

Education. Table 3 shows that people with disabilities tend to have less education. Yet, education seems to have the opposite effects, at least for men, on the propensity to become self-employed for those with and without work limitations (see Table 4). In particular, for men, self-employment rates of those without work limitations decrease from 8.8 percent for those with high school or less to 8.1 percent for those with a college degree or more. At the same time, self-employment rates of men with work limitations go up from 14.4 percent to 16.9 percent for the corresponding educational levels. While for women without work limitations, the relationship between education and the propensity to be self-employed can be characterized as weakly positive, it is unambiguously positive for women with work limitations, for whom self-employment rates jump from 9.5 percent to 12.9 percent.

Geographic region. The results in Table 3 show that prevalences of self-employment and work limitation are both differentially distributed across four geographic regions. In particular, self-employment is relatively more concentrated in the West, and those with work limitations are relatively more likely to live in the Midwest. As can be seen in Table 4, the gap in self-employment rates remains within each region and is somewhat bigger in the West and South.

Multivariate analysis

The results for two model specifications of the logistic regression of whether self-employed are reported in Table 5. The first specification, in addition to the work limitation indicator, includes controls for year, age, race, marital status, education, region and number of kids age 16 or younger in household. The results of the bivariate analysis above suggest a possibility of interaction effects, and, therefore, we add interactions of age and education with the work limitation dummy in the second model specification. Furthermore, the results are reported separately for men and women. The estimated model for men is substantially different from that for women, which is consistent with Lombard (2001); Georgellis & Wall (2005) who find that men and women differ in their motives to become self-employed. The differences are particularly noticeable in the estimates of being married and number of kids age 16 or younger — the estimates are positive for both genders but are much stronger for women.

The main result in Table 5 is that the work limitation coefficient is positive and strongly statistically significant for men and women in both model specifications. The average marginal effect is 0.042 and 0.037 for men and women, respectively. This indicates that, during the 1988-2009 period, everything being equal, men and women with work limitations have been 4.2 percent and 3.7 percentage points, respectively, more likely to be self-employed than those without work limitations.

Consistent with the literature on the determinants of self-employment (Quinn, 1980; Fuchs, 1982; Fairlie & Meyer, 1996; Karoly & Zissmopoulos, 2004; J. M. Zissimopoulos & Karoly, 2007), the probability of self-employment is positively associated with being older and being white, and strongly negatively associated with being black. Interestingly, the age gradient is less steep for women, indicating that, relative to men, younger women's likelihood of being self-employed is closer to that of older women. Given the strong positive estimates of being married and number of kids age 16 or younger, this result might suggest that younger women with kids find self-employment an attractive employment option that allows them to balance work and taking care of their families. However, having a work limitation alters the age gradient dramatically for women. As indicated by the statistically significant interaction term between age and work limitation, the self-employment gap between the youngest and the oldest groups increases almost twice. For men, the age gradient is also estimated to be steeper for those with work limitations as compared to that of men without limitations, yet the difference is small and not statistically significant.

The results in Table 5 indicate that education is differentially related to the probability of self-employment of men and women: being self-employed is more likely for less educated men, and the opposite is true for women. This is consistent with Van Der Sluis et al. (2008) who conduct a review of empirical studies on the relationship between schooling and entrepreneurial outcomes, such as selection, entry, and income. Their study finds no evidence of a systematic relationship between an individual's schooling level and the probability of selection into entrepreneurship. One possibility is that the relationship may depend on age, and especially so for men. Self-employment opportunities that require physical strength, such as construction work, will attract those who are younger and less educated. At the same time, older workers will select into self-employment jobs that require more experience and education, such as consulting for example. Therefore, among younger workers the relationship between education and the probability of selection into self-employment might be expected to be negative and positive for older workers.

Interestingly, as indicated by the estimate of the interaction term between education and work limitation, education is positively related to the probability of self-employment among work limited persons for both men and women. And this is in line with the above argument. Since work limitations are often physical limitations, it is better educated people with limitations who have more self-employment opportunities open to them.

The multivariate results on regional differences mirror those found in the bivariate analysis above. In particular, self-employment rates are statistically higher in the West, the fact underscored in Fairlies (2005) who reports that the West has had the highest self-employment rates during the period from 1979 to 2003.

It is important to note that the model presented in Table 5 is rather simple and may ignore factors that are relevant for the propensity of being self-employed. If, in addition, these unobserved factors are correlated with the covariates in the model, the estimates may be biased. Given the cross-sectional nature of the data, the possibilities to control for unobserved heterogeneity are limited. One possibility is to incorporate more covariates in the model. Our experimentations with different model specifications which included additional covariates, such as industry and occupation indicators for example, did not substantially change the results. In particular, for men, the work limitation estimates remained almost the same when controls for occupation and industry were added to the model. For women,

the work limitation estimates became smaller, 0.444 in model 1 and 0.578 in model 2, but were still substantial in magnitude and strongly statistically significant. Overall, the result that the likelihood of self-employment is positively associated with having a work limitation was confirmed with model specifications including more covariates.

The fact that the work limitation measure is self-reported presents another econometric issue. The issue is of a particular concern when the objective is to estimate the effect of work limitation on the labor force participation. Here the work limitation indicator is likely to pick up effects of other reasons for not working, which the respondent may want to justify by reporting a work limitation. In our particular case, however, the endogeneity of the work limitation variable with the labor force participation decision may be not an issue if the unobserved factors related to the labor force participation are at the same time unrelated to the decision to become self-employed.

Yet selection into the labor force more generally should not be taken lightly. The decisions to work and be self-employed may be closely related. This is the case, for example, when an individual's choices are narrowed primarily to two options: not to work or to be self-employed. In other words, that is when self-employment is considered as the only possibility to continue to work. Such situation may be especially relevant for someone with a disability for whom being self-employed can make it easier to make accommodations in the work environment and continue to work compared to being an employee. Our estimation does not specifically account for selection into the labor force, and the issue is left to be addressed by future research.

Objective disability measures

In 2009, among workers age 25-64, estimated 2,028 thousand males and 2,007 thousand females had a difficulty with one or more of the following tasks: hearing, seeing, concentrating/remembering, walking and climbing, dressing and bathing, or doing errands alone. These numbers are approximately 70 percent higher than the numbers of those with work limitations, 1,135 thousand males and 1,224 thousand females (see Table 6). Among the three most prevalent limitation types are difficulty walking or climbing stairs (647 thousands males and 930 thousands females), difficulty hearing (804 thousands males and 480 thousands females), and difficulty concentrating/remembering (502 thousands males and 481 thousands females).

The overlap of the work-limitation and disability measures is moderate (see Table 6). Among those with work limitations, 36.4 percent of males and 37.4 percent of females report having any of the six disabilities. At the same time, less than a quarter of those with a disability describe themselves as work-limited (20.4 percent of males and 22.8 percent of females). This fraction, however, varies substantially by disability type. For example, having a work limitation is more common among those with daily activity limitations (58.8 percent for males and 44.3 percent for females), upper and lower mobility limitations (30.5 and 34.2 percent for males and 30.9 and 48.5 percent for females), and cognitive impairments (32.5 percent for males and 29.4 percent for females).

Table 7 reports self-employment rates for each of the six impairments and the combined measure indicating any of these impairments. The results show that having any of the impairments is associated with a 1.2 percent increase in the likelihood of self-employment for men and a 2.3 percent increase for women, which is statistically significant at the 10

percent level for men and at the 1 percent for women. It should be noted that these increases are smaller than those associated with presence of a work limitation, 9.6 percent for men and 8.1 percent for women in 2009. However, combining different impairments into one measure of disability masks substantial differences across disability types. As table 7 shows, while the majority of disability types are associated with higher self-employment rates, some are not. In particular, difficulty hearing is related to lower self-employment rates, by 1.6 percentage points for men and by 0.6 percentage points for women. Similarly difficulty seeing is associated with a lower self-employment rate among women. The results are not statistically significant, however.

The strongest increase in self-employment rates is observed among those with a difficulty walking or climbing stairs or a difficulty dressing or bathing, i.e. lower and upper mobility impairments. For men, having a lower mobility impairment is associated with a 4.9 percentage point increase in the likelihood of self-employment and having an upper mobility impairment with a 9.9 percentage point increase, both are statistically significant at the 1 percent level. For women, difficulty walking or climbing stairs increases self-employment rates by 4.2 percentage points to 9.7 percent (significant at the 1 percent level), and difficulty dressing or bathing by 5.6 percentage points to 11.1 percent (significant at the 5 percent level). There are two other statistically significant results in Table 7. Thus, having a difficulty remembering and concentrating or a difficulty doing errands alone such as visiting a doctor's office or shopping are both related to a higher likelihood of self-employment among women. [3]

Overall, the evidence suggests that relationship between disability and self-employment varies by limitation type and gender. But for both men and women, lower and upper mobility impairments are related to substantially higher self-employment rates.

Summary

Employment rates among people with disabilities have been declining for the last twenty years. Increasing the labor force participation of people with disabilities who are willing and able to work is an important policy task, which requires better understanding of work opportunities available to people with disabilities and of incentives/disincentives facing them in the labor market. Using the March CPS data, this analysis shows that, during the 1988 - 2009 period, workers with work limitations were substantially more likely to be self-employed in unincorporated businesses than their non-disabled counterparts, with the gap ranging from 3.4 to 8.8 percentage points. Furthermore, while self-employment rates among those without work limitations declined throughout the period, the corresponding rates of workers with disabilities appear to have followed a U-shaped pattern, declining till 2002 and rising afterwards. During the latter years of the period, self-employment rates reached the lowest ever level in 2009 at 6.5 percent for workers without work limitations, and the highest levels in 2007 and 2009 at 15.5 percent and 15.3 percent, respectively, for workers with work limitations.

Analyses by strata defined by gender, age, race, education, marital status and geographic region further confirm that having a work limitation is positively associated with a

[3] All statistically significant differences in Table 7 hold after controlling for age, race, marital status, education and geographic region. The results are available upon request.

higher likelihood of being self-employed. Everything being equal, men and women who report a work limitation are 4.2 percentage points and 3.7 percentage points, respectively, are more likely to be self-employed than their not work limited counterparts. Additionally, some of these characteristics, which are generally related to the likelihood of self-employment, appear to interact with having a work limitation. In particular, oder and more educated individuals with work limitations are relatively more likely to be self-employed compared to those without work limitations.

Using an additional set of six measures on physical and cognitive impairments, available for 2009, the analysis finds that the relationship between disability and self-employment varies by disability type. Furthermore, differences in self-employment rates are generally lower when using these potentially more objective measures of disability. Of the six disability types, lower mobility impairments — the most prevalent disability type in the data sample — and upper mobility impairments are found to be associated with the strongest increase in the self-employment rate. Thus in 2009, workers with difficulties walking or climbing stairs were 4.3 percentage points for males and 4.2 percentage points for females more likely to be self-employed.

The results of our multivariate analysis should be considered with caution. More research is definitely needed to better understand why self-employment rates are higher among people with work limitations/disabilities – whether it is due to having a work limitation/disability per se or to some other factors. As we discuss in the paper, the choice to become self-employment can be driven by unobserved factors correlated with having a work limitation or other covariates in the model, and therefore the estimates can be biased. To address the issue, we used a rich set of covariates and explored a number of model specifications. Across model specifications, the estimate of the self-employment gap always remained statistically significant and substantial in magnitude. One specific source of unobserved heterogeneity is selection into the labor force, which is strongly related to the work limitation status. Our model is estimated on the sample of workers and does not control for selection into employment beyond that accounted by the observed characteristics in the model. Selection into employment, however, may be related to the decision to become self-employed. This is particularly so when being self-employed presents the only suitable employment option. For example, women with little children who want to stay at home may opt to become self-employed, but would not work if self-employment was not possible. A similar argument can be made about people with disabilities. Addressing this issue of selection into the labor force is beyond the scope of the paper and is left for further research.

Assuming that having a work limitation/disability does lead to a higher chance of self-employment, it is not clear, however, why someone with a health problem should decide to become self-employed. The existing self-employment theories do not offer a straightforward explanation. In particular, theories that emphasize individual characteristics such as entrepreneurial ability, risk tolerance, access to capital, and family background are inadequate because of the random or near so nature of disability. One possible explanation is that self-employment may be an attractive option for whom traditional full-time jobs may be too demanding because of health problems. Self-employment may offer flexible schedules and/or better work environments to accommodate these problems. Another possible explanation is that disabled people who are willing to work are pushed into self-employment

by the worse prospects in the labor market caused by employer discrimination. Finally, earnings limits imposed by public disability income programs, such as Social Security Disability Insurance and Supplemental Security Income, may prevent people with disabilities from seeking traditional full-time jobs.

Based on the results of the analysis it appears that, at least partly, selection into self-employment among those with disabilities is a voluntary choice as more advantaged groups – those with more education and experience – show relatively higher self-employment rates. Additional support for this argument is given by the evidence that self-employment is more frequent among people with mobility limitations. Since people with mobility impairments may face transportation difficulties, it may be easier to choose work locations when one is self-employed rather than employee.

If self-employment is an attractive option for paid work among people with disabilities, public policies should encourage it. The traditional policies facilitating access to capital and exempting from regulation should probably be tailored specifically for those with disabilities. Running your own business requires understanding of many things, including finance, marketing, relationship with customers and suppliers. The evidence in the paper suggests that, among those with disabilities, education is important for starting own business, which among other things might indicate that acquiring and processing such information can be a challenge for those with less schooling. A specific policy recommendation in this case would be to improve understanding of how to run a small business aimed at people with disabilities, and especially those with lower levels of formal schooling.

Yet it should be noted, that the extent of encouragement of self-employment among those with disabilities must be in line with expected social benefits — after all self-employment is riskier than regular employment. In particular, more research is need to determine whether self-employment is a viable way for the disabled who do not work to get back into the labor force and ultimately to economic self-reliance. Finally, the analysis points to a possibility other than self-employment. In particular, providing better accommodation in the regular work places might prove fruitful for increasing labor force participation of people with disabilities.

References

Acemoglu, D., & Angrist, J. D. (2001, October). Consequences of employment protection? The case of the Americans with Disabilities Act. *Journal of Political Economy*, *109*(5), 915-957.

Autor, D. H., & Duggan, M. G. (2003, February). The rise in the disability rolls and the decline in unemployment. *The Quarterly Journal of Economics*, *118*(1), 157-205.

Blanchflower, D. G. (2004). Self-employment: More may not be better. *Swedish Economic Policy Review*, *11*(2), 15-74.

Blanck, P. D., Sandler, L. A., ., S. J. L., & Schartz, H. A. (2000). The emerging workforce of entrepreneurs with disabilities: Preliminary study of entrepreneurship in Iowa. *Iowa Law Review*, *85*, 1583-1668.

Blau, D. M. (1987). A time-series analysis of self-employment in the united states. *The Journal of Political Economy*, *95*(3), 445-467. Available from `http://www.jstor.org/stable/1831972`

Borjas, G. J. (1986). The self-employment experience of immigrants. *Journal of Human Resources*, *21*(4), 485-506. Available from `http://econpapers.repec.org/RePEc:uwp:jhriss:v:21:y:1986:i:4:p:485-506`

Borjas, G. J., & Bronars, S. G. (1989). Consumer discrimination and self-employment. *The Journal of Political Economy*, *97*(3), 581-605. Available from `http://www.jstor.org/stable/1830456`

Bound, J., & Waidmann, T. (1992). Disability transfers, self-reported health, and the labor force attachment of older men: Evidence from the historical record. *The Quarterly Journal of Economics*, *107*(4), 1393-1419.

Bound, J., & Waidmann, T. (2002). Accounting for recent declines in employment rates among the working-aged disabled. *Journal of Human Resources*, *37*(2), 231-250.

Boylan, A., & Burchardt, T. (2002). *Barriers to self-employment for disabled peoples* (Report for the Small Business Service). Royal National Institute for the Blind, London.

Bruce, D. (2002). Taxes and enterpreneurial endurance: Evidence from the selef-employed. *National Tax Journa*, *54*(1), 5-24.

Burkhauser, R. V., Daly, M. C., Houtenville, A. J., & Nargis, N. (2002). Self-reported work limitation data: What they can and cannot tell us. *Demography*, *39*(3), 541-555.

Burkhauser, R. V., & Houtenville, A. J. (2006). *A guide to disability statistics from the Current Population Survey – annual social and economic supplement (March CPS). rehabilitation research and training center on disability demographics and statistic.* Cornell University, Ithaca, NY.

Dunn, T., & Holtz-Eakin, D. (2000, April). Financial capital, human capital, and the transition to self-employment: Evidence from intergenerational links. *Journal of Labor Economics*, *18*(2), 282-305. Available from `http://ideas.repec.org/a/ucp/jlabec/v18y2000i2p282-305.html`

Evans, D. S., & Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy*, *97*(4), 808-827. Available from `http://www.jstor.org/stable/1832192`

Evans, D. S., & Leighton, L. S. (1989, June). Some empirical aspects of entrepreneurship. *American Economic Review*, *79*(3), 519-35. Available from `http://ideas.repec.org/a/aea/aecrev/v79y1989i3p519-35.html`

Fairlie, R. W. (1999). The absence of the african-american owned business: An analysis of the dynamics of self-employment. *Journal of Labor Economics*, *17*(1), 80-108. Available from http://www.jstor.org/stable/10.1086/209914

Fairlie, R. W., Kapur, K., & Gates, S. (2011). Is employer-based health insurance a barrier to entrepreneurship? *Journal of Health Economics*, *30*(1), 146 - 162. Available from http://www.sciencedirect.com/science/article/B6V8K-512K1KY-1/2/7d515ef672f177ee1745e64cd93f0d3e

Fairlie, R. W., & Krashinsky, H. A. (2006, July). *Liquidity constraints, household wealth, and entrepreneurship revisited* (IZA Discussion Papers No. 2201). Institute for the Study of Labor (IZA). Available from http://ideas.repec.org/p/iza/izadps/dp2201.html

Fairlie, R. W., & Meyer, B. D. (1996). Ethnic and racial self-employment differences and possible explanations. *The Journal of Human Resources*, *31*(4), 757-793.

Fairlies, R. W. (2005, December). *Self-employed business ownership rates in the united states: 1979–2003* (Small Business Association Research Summary No. 243).

Fuchs, V. R. (1982). Self-employment and labor force participation of older males. *The Journal of Human Resources*, *17*(3), 339–357.

Georgellis, Y., & Wall, H. J. (2005). Gender differences in self-employment. *International Review of Applied Economics*, *19*(3), 321-342.

Gruber, J., & Poterba, J. (1994). Tax incentives and the decision to purchase health insurance: Evidence from the self-employed. *The Quarterly Journal of Economics*, *109*(3), 701-733. Available from http://www.jstor.org/stable/2118419

Hale, T. W. (2001). The lack of a disability measure in today's Current Population Survey. *Monthly Labor Review*, *124*(6), 38-40.

Hamilton, B. H. (2000, June). Does entrepreneurship pay? an empirical analysis of the returns to self-employment. *Journal of Political Economy*, *108*(3), 604-631.

Hotchkiss, J. L. (2004a). A closer look at the employment impact of the Americans with Disabilities Act. *The Journal of Human Resources*, *39*(4), 887-911.

Hotchkiss, J. L. (2004b). Growing part-time employment among workers with disabilities: Marginalization or opportunity? *Economic Review*(Q 3), 25-40.

Hout, M., & Rosen, H. (2000). Self-employment, family background, and race. *Journal of Human Resources*, *35*(4), 670-692. Available from http://econpapers.repec.org/RePEc:uwp:jhriss:v:35:y:2000:i:4:p:670-692

Jones, M. K., & Latreillet, P. L. (2006). *Disability and self-employment: evidence from the UK LFS* (mimeo). School of Business and Economics, University of Wales Swansea.

Jones, M. K., & Latreillet, P. L. (2011). Disability and self-employment: evidence from the UK LFS. *Applied Economics*, *43*(27), 4161-4178.

Karoly, L. A., & Zissmopoulos, J. (2004). Self-employment among older U.S. workers. *Monthly Labor Review*, *27*(7), 24-46.

Le, A. T. (1999). Empirical studies of self-employment. *Journal of Economic Surveys*, *13*(4), 381-416.

Lombard, K. V. (2001). Female self-employment and demand for flexible, non-standard work schedules. *Economic Inquiry*, *39*(2), 214–237. Available from http://dx.doi.org/10.1111/j.1465-7295.2001.tb00062.x

Moore, R. L. (1983). Employer discrimination: Evidence from self-employed workers. *The Review of Economics and Statistics*, *65*(3), 496-501. Available from http://www.jstor.org/stable/1924197

Pagán-Rodríguez, R. (2009). Self-employment among people with disabilities: evidence for europe. *Disability & Society*, *24*(2), 217-229. Available from http://www.tandfonline.com/doi/abs/10.1080/09687590802652504

Pagán-Rodríguez, R. (2011a). Self-employment and job satisfaction: evidence for older people with disabilities in europe. *European Journal of Ageing*, *8*, 177-187. Available from http://dx.doi.org/10.1007/s10433-011-0194-4 (10.1007/s10433-011-0194-4)

Pagán-Rodríguez, R. (2011b). Transitions to and from self-employment among older people with disabilities in europe. *Journal of Disability Policy Studies*. Available from http://dps.sagepub.com/content/early/2011/11/07/1044207311422232.abstract

Quinn, J. (1980). Labor-force participation patterns of older self-employed workers. *Social Security Bulletin*, *43*(4), 17-28. (cited By (since 1996) 20)

Rees, H., & Shah, A. (1986, January). An empirical analysis of self-employment in the u.k. *Journal of Applied Econometrics*, *1*(1), 95-108. Available from http://ideas.repec.org/a/jae/japmet/v1y1986i1p95-108.html

Schuetze, H. J. (2000). Taxes, economic conditions and recent trends in male self-employment: a canada–us comparison. *Labour Economics*, *7*(5), 507 - 544. Available from http://www.sciencedirect.com/science/article/pii/S0927537100000129

Schur, L. (2002). Dead end jobs or a path to economic well being? The consequences of non-standard work for people with disabilities. *Behavioral Science and the Law*, *20*(6), 601-620.

Schur, L. (2003). Barriers or opportunities? The causes of contingent and part-time work among people with disabilities. *Industrial Relations*, *42*, 589-622.

Stapleton, D. C., & Burkhauser, R. V. (2003). *The decline in employment of people with disabilities: A policy puzzle*. Kalamazoo, MI: Upjohn Institute for Employment Research.

Taylor, M. P. (1996). Earnings, independence or unemployment: Why become self-employed? *Oxford Bulletin of Economics and Statistics*, *58*(2), 253–266. Available from http://dx.doi.org/10.1111/j.1468-0084.1996.mp58002003.x

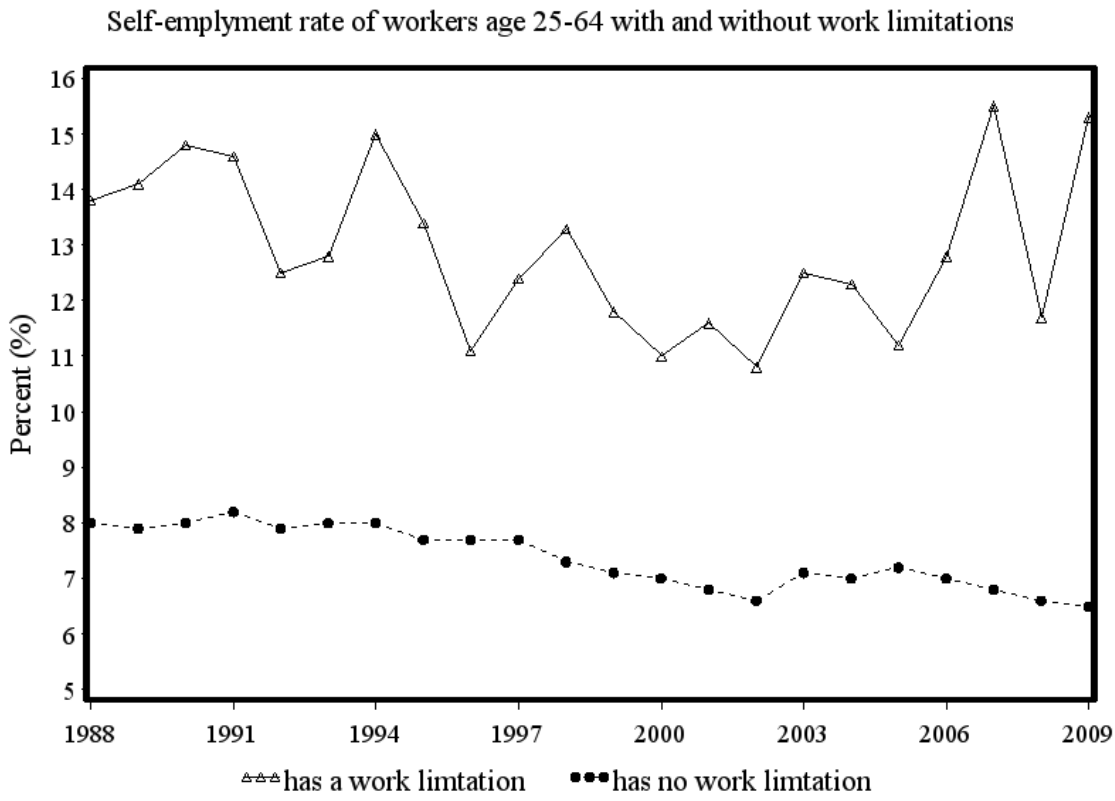
Van Der Sluis, J., Van Praag, M., & Vijverberg, W. (2008). Education and entrepreneurship selection and performance: A review of the empirical literature. *Journal of Economic Surveys*, *22*(5), 795–841. Available from http://dx.doi.org/10.1111/j.1467-6419.2008.00550.x

Velamuri, M. (2011). Taxes, health insurance, and women's self-employment. *Contemporary Economic Policy*, no–no. Available from http://dx.doi.org/10.1111/j.1465-7287.2011.00256.x

Wellington, N. J. (2001, October). Health insurance coverage and entrepreneurship. *Contemporary Economic Policy*, *19*(4), 465-478.

Zissimopoulos, J., Karoly, L. A., & Gu, Q. (2009, December). *Liquidity constraints, household wealth, and self-employment: The case of older workers* (Working Papers No. 725). RAND Corporation Publications Department. Available from `http://ideas.repec.org/p/ran/wpaper/725.html`

Zissimopoulos, J. M., & Karoly, L. A. (2007). Transitions to self-employment at older ages: The role of wealth, health, health insurance and other factors. *Labour Economics*, *14*(2), 269 - 295.



Source: Author's calculation using the March CPS data

Figure 1.

Table 1: Employment of the civilian population by work limitation status,1988-2009

	Persons with a work limitation			Persons with no work limitation		
Year	Total (thousands)	Total employed (thousands)	Percent	Total (thousands)	Workers employed (thousands0	Percent
1988	9707	2634	27.1	112715	87758	77.9
1989	9810	2786	28.4	114584	90230	78.7
1990	10078	2818	28	116139	91889	79.1
1991	10204	2681	26.3	117633	91712	78
1992	10675	2806	26.3	118852	92735	78
1993	10976	2931	26.7	120291	93977	78.1
1994	11928	2804	23.5	121054	95938	79.3
1995	12017	2927	24.4	122382	98527	80.5
1996	12003	2893	24.1	124000	99998	80.6
1997	12257	3046	24.9	125736	102566	81.6
1998	12080	2770	22.9	127388	104624	82.1
1999	11896	2616	22	128858	105984	82.2
2000	12001	2831	23.6	129980	107471	82.7
2001	12439	2709	21.8	133690	110018	82.3
2002	12789	2620	20.5	134967	109180	80.9
2003	12388	2342	18.9	137884	110556	80.2
2004	13380	2530	18.9	138132	110768	80.2
2005	13644	2512	18.4	139794	112603	80.5
2006	13969	2591	18.5	141680	114971	81.1
2007	13458	2484	18.5	144217	117292	81.3
2008	13269	2303	17.4	145542	117614	80.8
2009	14341	2400	16.7	145438	113031	77.7

a) Sample is civilian non-institutionalized population ages 25 to 64
b) Source: Author's calculations using March CPS

Table 2: Unincorporated and incorporated self-employment in nonagricultural industries of the civilian population by work limitation status, 1988-2009

Year	With a work limitation			With no work limitation		
	Total (thousands)	Self-employed unincorporated (percent)	Self-employed incorporated (percent)	Total (thousands)	Self-employed unincorporated (percent)	Self-employed incorporated (percent)
1988	2538	13.7	1.9	85759	8	3.2
1989	2696	14.1	2.5	88202	7.9	3.4
1990	2720	14.8	2.3	89798	8	3.2
1991	2562	14.6	1.9	89651	8.2	3.3
1992	2722	12.5	2.7	90687	7.9	3.4
1993	2823	12.7	2.2	91948	8	3.4
1994	2723	15	2.4	93716	8	3.7
1995	2812	13.4	2.4	96168	7.7	3.6
1996	2809	11.1	2.8	97602	7.7	3.3
1997	2945	12.4	2.7	100332	7.7	3.5
1998	2653	13.3	2.6	102528	7.3	3.6
1999	2525	11.8	3.1	103754	7.1	3.3
2000	2741	11	2.6	105165	7	3.5
2001	2626	11.6	2.2	107797	6.8	3.3
2002	2552	10.8	2.7	107028	6.6	3.6
2003	2289	12.5	3	109046	7.1	3.9
2004	2471	12.4	4.1	109333	7	4.1
2005	2475	11.2	3.8	111067	7.2	4.2
2006	2547	12.8	4.4	113507	7	4.1
2007	2426	15.5	3.9	115875	6.8	4.2
2008	2266	11.8	3.8	116067	6.6	4.2
2009	2359	15.3	3.4	111525	6.5	4.3

a) Sample is currently employed in nonagricultural industries civilians ages 25 to 64.
b) In all years, self-employment rates in unincorporated businesses of those with and without work limitations are statistically significantly different at the 1% level. The differences in self-employment rates in incorporated businesses are statist ically significant only in some years.
c) Source: Author's calculations using March CPS.

Table 3: Unincorporated self-employed, incorporated self-employed, and wage and salary workers by work limitation status and selected characteristics

	Unincorporated self-employed		Incorporated self-employed		Wage and salary workers	
Characteristic	Work limitation		Work limitation		Work limitation	
	yes	no	yes	no	yes	no
Total (N)	4,445	101,730	982	51,008	29,080	1,225,876
Gender						
Male	60.0	61.4	65.8	73.6	50.0	51.6
Female	40.0	38.6	34.2	26.4	50.0	48.4
Age group						
25-39	22.4	36.1	17.0	28.4	34.6	47.3
40-49	31.1	31.9	29.3	35.4	30.5	29.2
50-64	46.5	32.1	53.7	36.1	34.9	23.6
Race						
White	88.5	89.0	92.1	91.1	83.6	83.1
Black	7.5	5.6	5.1	3.1	12.3	11.6
Other	4.0	5.4	2.8	5.7	4.1	5.3
Marital status						
Married	61.6	73.2	71.2	81.8	49.9	65.2
Single	38.4	26.8	28.8	18.2	50.1	34.8
Education level						
High school or less	49.1	43.2	34.5	28.4	53.1	42.7
Some college	30.2	27.1	35.8	26.1	29.8	27.5
College graduate and higher	20.8	29.7	29.7	45.5	17.2	29.8
Region						
Northeast	15.0	18.1	17.5	20.3	18.4	19.8
Midwest	22.0	20.5	19.8	22.5	26.6	23.8
South	35.5	33.5	37.9	35.4	33.0	35.0
West	27.5	27.9	24.8	21.9	22.1	21.4

a) Sample is civilians age 25 to 64 employed in nonagricultural industries.
b) All numbers, except those in the first raw, are percents.
c) For each employment type, being work limited is associated with gender, age, marital status, education and region. Chi Squre test statistics are significan at 1% level in most cases. The exceptions are gender for unincorporated self-employed and region for incorporated self-employed, which are significant at 5% level. The relationship between race and having a work limitation is not statistically significant for both types of self-employed and is significant at 5% for wage and salary workers.
d) Source: Author's calculations using 1988-2009 March CPS.

Table 4: Self-employment rates in unincorporated businesses by work limitation status, gender, and selected characteristics

Characteristic	Persons with a work limitation			Persons with no work limitation		
	Both sexes	Men	Women	Both sexes	Men	Women
All	12.9	14.9	10.7	7.3	8.4	6.0
Age group						
25-39	8.9	10.4	7.1	5.7	6.3	5.0
40-49	13.1	15.3	10.8	7.8	9.2	6.4
50-64	16.2	18.9	13.5	9.5	11.4	7.3
Race						
White	13.5	15.6	11.2	7.7	8.8	6.5
Black	8.4	9.0	7.9	3.7	4.9	2.7
Other	12.8	16.1	9.2	7.4	8.3	6.4
Marital status						
Married	15.3	16.8	13.3	8.0	8.8	7.1
Single	10.3	12.6	8.2	5.8	7.6	4.1
Education level						
High school or less	12.1	14.4	9.5	7.4	8.8	5.8
Some college	12.9	14.7	11.2	7.2	8.2	6.2
College graduate and higher	14.9	16.9	12.9	7.1	8.1	6.0
Region						
Northeast	10.8	13.2	8.2	6.7	8.2	5.1
Midwest	11.0	12.1	9.8	6.3	7.0	5.7
South	13.7	16.3	10.7	7.0	8.4	5.4
West	15.5	17.3	13.5	9.3	10.2	8.1

a) Sample is civilians age 25 to 64 employed in nonagricultural industries.
b) In a series of logistic regressions, self-employment rates were found to be significantly higher, at 1% level, for those with work limitations. Each regression included separately age, race, marital status, education and region variables and was run with and without the gender control.
c) Source: Author's calculations using 1988-2009 March CPS.

Table 5: Estimated coefficients for the logistic regression of being self-employed.

	Males		Females	
Variable	Model 1	Model 2	Model 1	Model 2
Intercept	-2.095***	-2.1***	-2.771***	-2.785***
	(0.028)	(0.028)	(0.034)	(0.034)
Work limited	0.549***	0.728***	0.659***	0.967***
	(0.021)	(0.053)	(0.025)	(0.06)
Not work limited	-	-	-	-
Age 25-39	-0.673***	-0.671***	-0.507***	-0.493***
	(0.011)	(0.011)	(0.013)	(0.014)
Age 40-49	-0.25***	-0.249***	-0.24***	-0.233***
	(0.011)	(0.011)	(0.013)	(0.014)
Age 50-64	-	-	-	-
Work limited*Age 25-39		-0.054		-0.344***
		(0.053)		(0.066)
Work limited*Age 40-49		-0.011		-0.112*
		(0.05)		(0.059)
Work limited*Age 50-64		-		-
Not work limited*Age 25-39		-		-
Not work limited*Age 40-49		-		-
Not work limited*Age 50-64		-		-
White	0.076***	0.076***	0.113***	0.113***
	(0.019)	(0.019)	(0.023)	(0.023)
Black	-0.533***	-0.534***	-0.586***	-0.587***
	(0.025)	(0.025)	(0.031)	(0.031)
Other	-	-	-	-
Married	0.015	0.015	0.464***	0.465***
	(0.01)	(0.01)	(0.012)	(0.012)
Single	-	-	-	-
High school or less	0.13***	0.137***	-0.058***	-0.047***
	(0.01)	(0.01)	(0.013)	(0.013)
Some college	0.046***	0.05***	0.036***	0.042***
	(0.011)	(0.011)	(0.013)	(0.014)
College graduate and higher	-	-	-	-
Work limited*High school or less		-0.227***		-0.281***
		(0.057)		(0.066)
Work limited*Some college		-0.144**		-0.186***
		(0.063)		(0.07)
Work limited*College graduate and higher		-		-
Not work limited*High school or less		-		-
Not work limited*Some college		-		-
Not work limited*College graduate and higher		-		-
Northeast	-0.266***	-0.266***	-0.483***	-0.482***
	(0.012)	(0.012)	(0.016)	(0.016)
Midwest	-0.44***	-0.44***	-0.399***	-0.399***
	(0.012)	(0.012)	(0.015)	(0.015)
South	-0.185***	-0.185***	-0.356***	-0.356***
	(0.011)	(0.011)	(0.013)	(0.013)
West	-	-	-	-
Number of kids age 16 or younger	0.012***	0.012***	0.086***	0.086***
	(0.003)	(0.003)	(0.004)	(0.004)
Summary statistics:				
N	734928	734928	678181	678181
Pseudo-R2 adjusted	0.026	0.026	0.03	0.03

a) Sample is civilians age 25 to 64 employed in nonagricultural industries.
b) For brevity the estimates of year fixed effects included in the models are not shown in the table.
c) *** Indicates signficance at the 1% level and ** significance at the 5% level. The numbers in parentheses are standard errors.
d) Based on Model 1, the average marginal effect of being work limited is 0.042 and 0.037 for men and women, respectively.
e) Data source: 1988-2009 March CPS.

Table 6: Incidence of work limitations and disability among workers age 25-64, 2009

	Disab.=1	WL=1	WL=1 and Disab.=1	WL=1 if Disab.=1	Disab.=1 if WL=1
	N [thousands]	N [thousands]	N [thousands]	%	%
Males					
Difficulty hearing, deaf	804	1135	77	9.6	6.8
Difficulty seeing, blind	283	1135	55	19.5	4.9
Difficulty remembering, concentrating	502	1135	163	32.5	14.4
Difficulty walking or climbing stairs	647	1135	197	30.5	17.4
Difficulty dressing or bathing	99	1135	34	34.2	3
Difficulty doing errands	223	1135	131	58.8	11.6
Has any of the six listed disability conditions	2028	1135	413	20.4	36.4
Femles					
Difficulty hearing, deaf	480	1224	60	12.6	4.9
Difficulty seeing, blind	366	1224	44	11.9	3.6
Difficulty remembering, concentrating	481	1224	141	29.4	11.6
Difficulty walking or climbing stairs	930	1224	288	30.9	23.5
Difficulty dressing or bathing	113	1224	55	48.5	4.5
Difficulty doing errands	323	1224	143	44.3	11.7
Has any of the six listed disability conditions	2007	1224	458	22.8	37.4

a) Sample is civilian non-institutionalized workers age 25-64
b) Data source: 2009 March CPS
c) 'WL' indicates work limitation

Table 7: Self-employment rates by disability type, 2009

	Self-employment rates		Chi-square test of difference
	Disability=1	Disability=0	Pvalue
	%	%	
Males			
Serious difficulty hearing, deaf	6.2	7.8	0.165
Serious difficulty seeing, blind	10.8	7.7	0.115
Serious difficulty remembering, concentrating	9.4	7.7	0.254
Serious difficulty walking or climbing stairs	12.6	7.7	0.000
Difficulty dressing or bathing	17.6	7.7	0.003
Difficulty doing errands	8.8	7.8	0.647
Has any of the six listed disability conditions	8.9	7.7	0.095
Femles			
Serious difficulty hearing, deaf	4.9	5.5	0.624
Serious difficulty seeing, blind	5.1	5.5	0.770
Serious difficulty remembering, concentrating	9.0	5.5	0.005
Serious difficulty walking or climbing stairs	9.7	5.5	0.000
Difficulty dressing or bathing	11.1	5.5	0.030
Difficulty doing errands	9.2	5.5	0.015
Has any of the six listed disability conditions	7.8	5.5	0.000

a) Sample is civilian noninstitutionalized workers age 25-64
b) Data source: 2009 March CPS