Wage differentials and disability: discrimination or not?

Miguel A. Malo
Department of Economics and Economics History
University of Salamanca. Edificio FES Campus Miguel Unamuno.
37.007 Salamanca (Spain).
Telephone: +34 923294500 (ext. 3512), E-mail: malo@usal.es

Ricardo Pagan
Department of Applied Economics (Estructura Económica)
University of Malaga. Plaza de El Ejido s/n.
29.071 Malaga (Spain).
Telephone: +34 952131186, E-mail: rpr@uma.es

Abstract
Using data from the European Community Household Panel (1995-2001), we estimated corrected wage equations for daily activities limited and non-daily activities limited disabled and non-disabled. The results show that in most of the European countries there exists a wage differential in favour of people with disabilities not limited for daily activities compared to people without disabilities, especially for males, whereby the unexplained component contributes to raise this wage differential. The results confirm that in general wage differentials against people with disabilities are related with unobserved productivity differences and not only with employers' prejudices.

Keywords: Disability, wage differentials, discrimination, prejudices.
JEL classification: J150, I120, J700.

Corresponding author:
Ricardo Pagan
Department of Applied Economics (Estructura Económica)
University of Malaga. Plaza de El Ejido s/n.
29.071 Malaga (Spain).
Telephone: +34 952131186, Fax: +34 952132075.
E-mail: rpr@uma.es
1. Introduction

The fight against any type of discrimination toward disabled people by the effective application of equal opportunities principles at work has become one of the major challenges identified by the European Union for the near future.

Nowadays, a large number of international studies have been published analysing different aspects of disability as, for example, its negative effects on labour participation (e.g. Parsons, 1980; Kidd et al., 2000; Jones, 2006) and wage levels (e.g. Baldwin and Johnson, 1994 and 1995; Kidd et al., 2000), among others. With respect to wage differentials, Baldwin and Johnson (1994) points out as we decompose the observed wage difference into components the unexplained component (commonly called discrimination) must be interpreted with caution due to the characteristics that identify disabled people may also restrict their productivity. Namely, this component may reflect the existence of employer’s prejudice and unobserved productivity difference. Our objective is to correct this drawback through the use a data base (European Community Household Panel, ECHP) which allows us to distinguish three different groups of individuals (Gannon, 2005): daily activities limited disabled, non-daily activities limited disabled and non-disabled1. Since we can identify the non-daily activities limited disabled we assume that these individuals do not reduce their productivity as result of their disability (due to they do not experience limitations in their daily activities because of adaptation or thanks to personal or technical support) and hence the entire unexplained component of the wage differential between non-daily activities limited disabled and non-disabled must be considered as discrimination and not contaminated by unobserved productivity differences linked to disability, which is a novelty in the

---

literature on disability and wages, and allow us to estimate a measure of wage discrimination against disabled net of productivity differences.

2. Data and methodology

The data on disability and wage levels are taken from the ECHP for the period 1995-2001. This survey contains detailed information on individuals’ labour market activities and health status. The sample consists of working-age individuals (males and females), aged 15 to 64, from 11 European countries for which data are available (Spain, Portugal, Italy, UK, Austria, Belgium, Denmark, Finland, Ireland, The Netherlands and Germany). Our measure of disability is based on the response to the following question (PH002): “Do you have any chronic, physical or mental health problem, illness or disability?” If the person answers “Yes” to this question, the follow-up question (PH003), “Are you hampered in your daily activities by this chronic or mental health problem, illness or disability?”, allows us to know how severe the disabilities are. Following Gannon (2005), it is possible distinguish three groups: a) those reporting they are severely limited in their daily activities b) those who are limited to some extent; and c) those who report such a condition but which does not limit them in their daily activities. The first two groups can be considered as “daily activities limited disabled”, whereas the third as “non-daily activities limited disabled”. The non-disabled individuals are identified as those who respond “No” to the first question.

2 For the importance of daily activities in disability definitions see, for example, Gudex and Lafortune (2000).

3 She notes that a person may respond as not limited in daily activities, but without adaptation it is possible that they should be classified as severely/to some extent limited.

4 Some authors have argued that self-classification may lead to overestimation (when the individuals try to justify situations of inactivity or limited work activity) or underestimation (when the disability is regarded as a stigma) of the prevalence of disability rates (Chirikos and Nestel, 1984; Kreider 1999). However, according to García-Serrano and Malo (2002), this bias is unlikely to appear on the ECHP because question PH003 does not refer to working disability (but to daily activities in general) and the questions regarding labour market and disability are too far down the questionnaire for the respondent to make a connection, which would be a necessary condition for this type of bias.
According to the traditional labour force participation model, the individual decides enter the labour market if the employer’s wage offer is equal or higher than his/her reservation wage. Following the methodology used in other works (e.g. Baldwin and Johnson, 1994 and 1995; Kidd et al., 2000), we estimate separately the following corrected wage equations for the daily activities limited disabled (D_1), non-daily activities limited disabled (D_2) and non disabled (N):

\[ \ln W_{ij} = X'_{ij} \beta_j + c \lambda_{ij} + \nu_{ij} \]  \hspace{1cm} (j = D_1, D_2, N)  \hspace{1cm} [1]

where \( \ln W_{ij} \) is the logarithm of the hourly wage, \( X_{ij} \) is a vector of characteristics related to the productivity for the individual \( i \) of group \( j \), \( \beta_j \) represents the associated returns from those characteristics, and \( \lambda \) is the selection term (the inverse Mills ratio) obtained from the Heckman two-stage method (1979).

To decompose the observed wage difference we use the method proposed by Reimers (1983) and previously used in earlier studies (e.g Kidd et al., 2000). The total wage difference between non-disabled (N) and disabled (D) workers can be decomposed as follows:

\[ \hat{\ln W_N} - \hat{\ln W_D} = (\bar{x}_N - \bar{x}_D) [d \hat{\beta}_N + (1-d) \hat{\beta}_D] + [\bar{x}_N(1-d) + \bar{x}_D d] (\hat{\beta}_N - \hat{\beta}_D) \]

\[ + (\hat{c}_N \bar{x}_N - \hat{c}_D \bar{x}_D) \]  \hspace{1cm} (D = D_1, D_2)  \hspace{1cm} [2]

where the left-hand side of equation [2] represents the mean observed wage difference between non-disabled and disabled. The first term on the right-hand side shows the part of wage difference that is attributable to differences in productivity, whereas that the second term represents the part of the wage difference which is unexplained. This unexplained term is generally interpreted as discrimination, but the distinction between daily activities limited and non-daily activities limited disabled allows us to control for
unobserved productivity difference and obtain a “true” measure of the wage
discrimination against people with disabilities. The third term measures that part
attributable to the selection term. Following Baldwin and Johnson (1994 and 1995) we
set the matrix \( d = 1 \), namely, we suppose that the non-discriminatory norm is the
observed wage structure of the non-disabled.

3. Results

Results are shown in Table 1, disaggregated by gender. The ‘natural’ experiment
is provided by panel A of this Table.

The total wage differential is usually either not statistically significant or in
favour of non-daily activities limited individuals instead of non-disabled persons,
especially for males. For these groups, the difference attributed to returns should
exclusively reflect discrimination, because there are not differences in productivity
related to disability (because they are not limited). Considering males, only in the two
countries with a significant wage differential in favour of non-daily activities limited
disabled, we find discrimination against them in Portugal (with -383\%, mainly
compensated by the selection term) and Germany (with -71\%, mainly compensated by
the characteristics term).

For females, we only find a difference linked to discrimination against this group
of disabled people when the total wage differential is positive (and statistically
significant). The only country where we find discrimination against these disabled
persons for males and females is the United Kingdom. Exclusively for females, we also
find discrimination in Ireland and Germany.

Panel B of Table 1 shows the comparison between non-disabled people and
daily activities limited disabled people. In all cases, when the total wage differential is
statistically significant (except for females in Italy) non-disabled people earn higher
wages. For males (and again, when the total differential is statistically significant), the returns term has a positive contribution to the total wage differential (with the exception of Ireland). For females, we obtain the same result, except for Italy as we mentioned before.

Therefore, we find evidence supporting that wage differentials against people with disabilities are probably linked (at least partially) to non-observed productivity differences related to disability. Anyway, we can not discharge that prejudices against disabled people will be more intense when they experience limitations in their daily activities. Usually, the intensity of prejudice was linked to the visibility of impairments related to disabilities (Baldwin and Johnson, 1995), but such eventual feedback between prejudices and disability severity has not been remarked before in economic literature and we do not have any empirical evidence to support or discharge this phenomenon.

4. Conclusions

Using ECHP data for 11 countries during the period 1995-2001, we have tried to disentangle the effect on wages of discrimination and non-observed productivity differentials linked to disability. We have used the questions provided by the ECHP in order to define a group of people with disabilities not experiencing limitations in their daily activities that have been considered as a group with the same productivity as non-disabled people. Therefore, when comparing both groups any wage differential attributed to ‘returns’ (using Oaxaca methodology) will be strictly related to discrimination based on prejudices and net of unobserved productivity differences related to disability. We have found that non-daily activities limited people with disabilities earn usually higher wages than non-disabled individuals or, at least, not less. In addition, differences in returns usually increase such difference, confirming that this
group of people with disabilities in general does not suffer wage discrimination related to disability. However, we obtain some exceptions as the UK case, where this group of people with disabilities suffers a typical wage discrimination related to disability. Nevertheless, in general our results provide new evidence alerting about an immediate attribution of wage differentials against people with disabilities to discrimination based on employers' prejudices and enhancing the importance of non-observed productivity differences linked to disabilities. An implication of this result for labour market policy is that policymakers must carry out initiatives to increase the productivity of the disabled collective in European countries in order to improve their wages.

References


## Table 1
Decomposition of wage differences by disability status.

### A) NON-DISABLED versus NON-DAILY ACTIVITIES LIMITED

<table>
<thead>
<tr>
<th></th>
<th>SPAIN</th>
<th>PORTUGAL</th>
<th>ITALY</th>
<th>UK</th>
<th>AUSTRIA</th>
<th>BELGIUM</th>
<th>DENMARK</th>
<th>FINLAND</th>
<th>IRELAND</th>
<th>NETHERLAND</th>
<th>GERMANY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>-0.020</td>
<td>100</td>
<td>-0.089</td>
<td>100</td>
<td>-0.106</td>
<td>100</td>
<td>0.019</td>
<td>-0.056</td>
<td>-0.060</td>
<td>-0.042</td>
<td>-0.083</td>
</tr>
<tr>
<td>Characteristics</td>
<td>-0.039</td>
<td>95</td>
<td>-0.070</td>
<td>79</td>
<td>-0.097</td>
<td>92</td>
<td>-0.022</td>
<td>-0.115</td>
<td>-0.054</td>
<td>-0.049</td>
<td>81</td>
</tr>
<tr>
<td>Returns</td>
<td>0.015</td>
<td>75</td>
<td>0.340</td>
<td>-383</td>
<td>-0.021</td>
<td>20</td>
<td>0.249</td>
<td>13.02</td>
<td>-0.069</td>
<td>123</td>
<td>0.010</td>
</tr>
<tr>
<td>Selection</td>
<td>0.004</td>
<td>-20</td>
<td>-0.359</td>
<td>405</td>
<td>0.012</td>
<td>-11</td>
<td>-0.208</td>
<td>-1.087</td>
<td>0.067</td>
<td>-1.200</td>
<td>0.028</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>-0.011</td>
<td>100</td>
<td>-0.123</td>
<td>100</td>
<td>-0.104</td>
<td>100</td>
<td>0.026</td>
<td>-0.040</td>
<td>0.040</td>
<td>100</td>
<td>0.087</td>
</tr>
<tr>
<td>Characteristics</td>
<td>-0.049</td>
<td>445</td>
<td>-0.119</td>
<td>97</td>
<td>-0.093</td>
<td>89</td>
<td>0.017</td>
<td>65</td>
<td>-0.040</td>
<td>100</td>
<td>-0.012</td>
</tr>
<tr>
<td>Returns</td>
<td>0.067</td>
<td>-609</td>
<td>-0.347</td>
<td>283</td>
<td>0.219</td>
<td>-211</td>
<td>0.107</td>
<td>409</td>
<td>-0.149</td>
<td>370</td>
<td>0.108</td>
</tr>
<tr>
<td>Selection</td>
<td>-0.029</td>
<td>264</td>
<td>0.343</td>
<td>-279</td>
<td>-0.230</td>
<td>221</td>
<td>-0.098</td>
<td>-374</td>
<td>0.149</td>
<td>-370</td>
<td>-0.056</td>
</tr>
</tbody>
</table>

**Note:** Wage difference significant at \( p < 0.05 \) (in bold).


---

### B) NON-DISABLED versus DAILY ACTIVITIES LIMITED

<table>
<thead>
<tr>
<th></th>
<th>SPAIN</th>
<th>PORTUGAL</th>
<th>ITALY</th>
<th>UK</th>
<th>AUSTRIA</th>
<th>BELGIUM</th>
<th>DENMARK</th>
<th>FINLAND</th>
<th>IRELAND</th>
<th>NETHERLAND</th>
<th>GERMANY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>0.175</td>
<td>100</td>
<td>0.155</td>
<td>100</td>
<td>0.040</td>
<td>100</td>
<td>0.056</td>
<td>100</td>
<td>0.043</td>
<td>100</td>
<td>0.077</td>
</tr>
<tr>
<td>Characteristics</td>
<td>0.119</td>
<td>68</td>
<td>0.112</td>
<td>72</td>
<td>0.019</td>
<td>48</td>
<td>0.014</td>
<td>25</td>
<td>0.016</td>
<td>12</td>
<td>0.000</td>
</tr>
<tr>
<td>Returns</td>
<td>0.086</td>
<td>49</td>
<td>0.306</td>
<td>197</td>
<td>0.027</td>
<td>67</td>
<td>0.142</td>
<td>253</td>
<td>0.139</td>
<td>325</td>
<td>-0.046</td>
</tr>
<tr>
<td>Selection</td>
<td>-0.030</td>
<td>-17</td>
<td>-0.263</td>
<td>-170</td>
<td>-0.006</td>
<td>-15</td>
<td>-0.100</td>
<td>-178</td>
<td>-0.102</td>
<td>-238</td>
<td>0.064</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>0.121</td>
<td>100</td>
<td>0.074</td>
<td>100</td>
<td>0.042</td>
<td>100</td>
<td>0.056</td>
<td>100</td>
<td>0.043</td>
<td>100</td>
<td>0.077</td>
</tr>
<tr>
<td>Characteristics</td>
<td>0.052</td>
<td>43</td>
<td>0.083</td>
<td>112</td>
<td>-0.022</td>
<td>52</td>
<td>-0.012</td>
<td>-66</td>
<td>-0.042</td>
<td>380</td>
<td>-0.028</td>
</tr>
<tr>
<td>Returns</td>
<td>0.117</td>
<td>97</td>
<td>0.164</td>
<td>221</td>
<td>0.092</td>
<td>-219</td>
<td>0.316</td>
<td>1731</td>
<td>0.010</td>
<td>-90</td>
<td>0.019</td>
</tr>
<tr>
<td>Selection</td>
<td>-0.048</td>
<td>-40</td>
<td>-0.173</td>
<td>-233</td>
<td>-0.112</td>
<td>266</td>
<td>-0.286</td>
<td>-1565</td>
<td>0.021</td>
<td>-190</td>
<td>-0.007</td>
</tr>
</tbody>
</table>

**Note:** Wage difference significant at \( p < 0.05 \) (in bold).