

# **GENDER WAGE DISCRIMINATION AND THE ATTRACTIVENESS OF FOREIGN MNC SUBSIDIARIES AS EMPLOYERS FOR WOMEN**

## **ONLINE APPENDIX**

### **Appendix A: Identification strategy**

To address a potential correlation between the gender wage gap and our regression of interest, the probit model for matching with a foreign MNC subsidiary as new employer, we use a two-stage procedure in which we first estimate the gender wage gap and subsequently include the estimated gender wage gap in our regression that models a woman's matching with a foreign MNC subsidiary on labor markets. This equation is causally identified (i.e., we get an unbiased and consistent estimate on our coefficient on the gender wage gap) if we find a convincing instrumental variable (IV) – a variable that affects the supposedly endogenous variables (the gender wage gap) but not directly the equation of interest (the employer match equation, i.e., the reduced form equation).

Following Bennedsen, et al. (2022), we use the Danish wage transparency law from 2006 for identification. This reform mandated firms with more than 35 employees to disclose wages to employee representatives. Bennedsen, et al. (2022) demonstrate that the reform statistically and economically significantly affected wages, it increased women's wages and decreased men's wages.

Like Bennedsen, et al. (2022), who also run wage regressions in their study, we find statistically and economically significant effects of the reform in our data. Therefore, there is a significant correlation between the reform and wages such that the first property for an IV to be valid is satisfied. For the second property for an IV to be valid, uncorrelatedness with the error term of the equation of interest, there is no direct test, especially not in a discrete choice setting like ours. We do, however, calculate a Hansen-Sargan J test (Sargan, 1958; Hansen, 1982) based on “generalized residuals” which indicate that we cannot reject orthogonality of our IVs. Perhaps most importantly, there is no economic reason why the wage transparency reform should affect the labor market matching of women with domestic firms or foreign MNC subsidiaries in different ways.

More formally, let  $\mathbf{X}_i^{F,M}$  denote the vector of characteristics of individual  $i$ , with  $F$  female and  $M$  male, which are likely to affect both wages and the decision to match with a foreign MNC vs a domestic firm and denoting  $\mathbf{Z}_i^{F,M}$  the vector of characteristics likely to affect wages only, in the first stage we estimate:

$$\ln(w_i^M) = \mathbf{X}_i^M \boldsymbol{\beta}^M + \mathbf{Z}_i^M \boldsymbol{\delta}^M + \varepsilon_i^M \text{ for all men and}$$

$$\ln(w_i^F) = \mathbf{X}_i^F \boldsymbol{\beta}^F + \mathbf{Z}_i^F \boldsymbol{\delta}^F + \varepsilon_i^F \text{ for all women.}$$

The variables included in  $\mathbf{Z}_i^{F,M}$  constitute our IVs. To specify our vector of IVs  $\mathbf{Z}_i^{F,M}$ , we follow Bennedsen, et al. (2022) who specify the reform effects by including two dummy variables, “treated” which is coded one if the firm had more than 35 employees prior to 2006 (and 0 otherwise) and another dummy “post” which is coded 1 for 2006 and all subsequent years.

We calculate the individual-specific gender wage gap,  $GWG_i$ , as  $GWG_i = \mathbf{X}_i^F (\boldsymbol{\beta}^M - \boldsymbol{\beta}^F) + \mathbf{Z}_i^F (\boldsymbol{\delta}^M - \boldsymbol{\delta}^F)$  and substitute it into our equation of interest, the probability of woman  $i$  matching with a foreign MNC subsidiary vs another domestic firm:

$$P[\text{move to MNC} | \mathbf{X}_i, \mathbf{Z}_i] = \mathbf{X}_i^F \boldsymbol{\theta} + \alpha GWG_i + \omega_i.$$

Given the validity of our IVs, our coefficient of main interest,  $\alpha$ , is estimated without bias.  $GWG_i$  is a so-called “generated regressor”, i.e., it was estimated in a first stage, which is why the corresponding variance-covariance matrix is no longer block-diagonal which is why we block-bootstrap the associated standard errors.

## Appendix B: Total factor productivity calculation

We follow Akerberg, et al. (2007) and use the notation of the review of TFP estimation methods by van Beveren (2012). Our point of departure is a Cobb-Douglas production function of the form

$$Y_j = A_j K_j^{\beta_K} L_j^{\beta_L} M_j^{\beta_M},$$

where  $Y_j$  denotes output of firm  $j$ , and  $K_j$ ,  $L_j$  and  $M_j$  the associated inputs capital, labor, and materials which are linked to output via their output elasticities  $\beta$ . The term  $A_j$  represents the efficiency level of firm  $j$  and constitutes the quantity of interest, TFP.

Taking logs, depicted by lower-case letters, leads to our TFP estimation equation

$$y_j = \beta_0 + \beta_K k_j + \beta_L l_j + \beta_M m_j + \varepsilon_j,$$

from which we back out firm-level productivity,  $\widehat{\omega}_j$ , as  $\widehat{\omega}_j = y_j - \widehat{\beta}_0 - \widehat{\beta}_K k_j - \widehat{\beta}_L l_j - \widehat{\beta}_M m_j$ ,

where the superscripts “^” denote estimated parameters.

The TFP estimating equation could in principle simply be estimated by OLS. There is, however, a rich literature in Industrial Organization which has shown that the coefficient estimates from such a productivity equation might be biased because of the endogeneity of input choice since we would need to assume that input choices are independent of a firm's efficiency level. One way to mitigate this problem might be the use of firm-specific fixed effects since these would absorb all time-invariant productivity determinants (Akerberg, et al., 2007), which is also the way we proceed to estimate TFP. To empirically specify our TFP estimating equation we proxy output by value added as recommended by Olley and Pakes (1996), capital by total assets, labor by the total number of employees and materials by purchase of goods. We also control for sector and time dummies.

## Appendix C: Wage regressions calculating the degree of gender wage discrimination

Table OA1: Wage regressions calculating the degree of gender wage discrimination

|                                                                              | Women             | Men               |
|------------------------------------------------------------------------------|-------------------|-------------------|
| Married (d)                                                                  | 0.075<br>(0.000)  | 0.135<br>(0.000)  |
| # of children                                                                | 0.026<br>(0.000)  | 0.025<br>(0.000)  |
| At least one child < 3 years (d)                                             | -0.012<br>(0.000) | 0.010<br>(0.000)  |
| Foreign citizen (d)                                                          | 0.055<br>(0.000)  | 0.054<br>(0.000)  |
| Place of residence is also place of workplace (d)                            | -0.022<br>(0.000) | -0.039<br>(0.000) |
| Place of residence is also place of workplace and both are in Copenhagen (d) | -0.003<br>(0.142) | 0.003<br>(0.108)  |
| Years of working experience                                                  | 0.029<br>(0.000)  | 0.017<br>(0.000)  |
| Years of working experience <sup>2</sup>                                     | -0.002<br>(0.000) | -0.001<br>(0.000) |
| Years of tenure                                                              | 0.022<br>(0.000)  | 0.024<br>(0.000)  |
| Years of tenure <sup>2</sup>                                                 | -0.001<br>(0.000) | -0.001<br>(0.000) |
| Primary school (d)                                                           | -0.087<br>(0.000) | -0.094<br>(0.000) |
| High school (d)                                                              | -0.122<br>(0.000) | -0.091<br>(0.000) |
| Short vocational training (d)                                                | 0.028<br>(0.000)  | 0.045<br>(0.000)  |
| Medium long vocational training (d)                                          | 0.097<br>(0.000)  | 0.118<br>(0.000)  |
| BA (d)                                                                       | 0.111<br>(0.000)  | 0.116<br>(0.000)  |
| MA (d)                                                                       | 0.063<br>(0.000)  | 0.082<br>(0.000)  |
| PhD (d)                                                                      | 0.061<br>(0.000)  | 0.141<br>(0.000)  |
| TMT member (d)                                                               | 0.092<br>(0.000)  | 0.144<br>(0.000)  |
| Management team member (d)                                                   | 0.278<br>(0.000)  | 0.264<br>(0.000)  |
| Manager (d)                                                                  | 0.090<br>(0.000)  | 0.033<br>(0.000)  |

|                                               | <b>Women</b>      | <b>Men</b>        |
|-----------------------------------------------|-------------------|-------------------|
| Firm age                                      | -0.000<br>(0.000) | -0.000<br>(0.000) |
| ln(# employees)                               | -0.012<br>(0.000) | 0.012<br>(0.000)  |
| ln(# employees) <sup>2</sup>                  | 0.001<br>(0.000)  | -0.002<br>(0.000) |
| Share highly educated employees               | -0.033<br>(0.000) | -0.031<br>(0.000) |
| # hierarchy levels relative to # of employees | 0.584<br>(0.000)  | 0.704<br>(0.000)  |
| Treated (d)                                   | 0.051<br>(0.000)  | 0.017<br>(0.000)  |
| Post (d)                                      | 0.006<br>(0.001)  | -0.008<br>(0.000) |
| # obs.                                        | 537,088           | 783,162           |
| Adj. R <sup>2</sup>                           | 0.8516            | 0.8429            |

P-value in parentheses; (d) dummy variable. The specifications also include sets of sector, region and year dummy variables.

## Appendix D: Employer change with different matched control groups and wage outcomes

Table OA2: Results of a multinomial logit model for the likelihood of employer change with different matched control groups and wage outcomes.

|                                                                              | Matching with...  |                   |                   |
|------------------------------------------------------------------------------|-------------------|-------------------|-------------------|
|                                                                              | ...foreign MNC    |                   | ...domestic firm  |
|                                                                              | Wage increase     | No wage increase  | No wage increase  |
| Gender wage discrimination (in %)                                            | 0.060<br>(0.000)  | 0.087<br>(0.000)  | 0.053<br>(0.000)  |
| Average MNC share women in MT/average dom. firm share women in MT            | 0.206<br>(0.000)  | 0.211<br>(0.000)  | 0.258<br>(0.000)  |
| Average dom. firm TFP/average dom. MNC TFP                                   | 0.006<br>(0.257)  | -0.002<br>(0.640) | 0.006<br>(0.000)  |
| Married (d)                                                                  | -0.260<br>(0.000) | -0.484<br>(0.000) | -0.284<br>(0.000) |
| # of children                                                                | -0.054<br>(0.013) | -0.010<br>(0.528) | 0.032<br>(0.000)  |
| At least one child < 3 years (d)                                             | -0.036<br>(0.444) | -0.135<br>(0.000) | -0.080<br>(0.000) |
| Foreign citizen (d)                                                          | 0.168<br>(0.588)  | 0.055<br>(0.794)  | -0.076<br>(0.387) |
| Place of residence is also place of workplace (d)                            | -0.033<br>(0.517) | -0.075<br>(0.047) | -0.041<br>(0.003) |
| Place of residence is also place of workplace and both are in Copenhagen (d) | 0.006<br>(0.936)  | 0.137<br>(0.018)  | 0.205<br>(0.000)  |
| Years of working experience                                                  | -0.005<br>(0.752) | -0.073<br>(0.000) | -0.092<br>(0.000) |
| Years of working experience <sup>2</sup>                                     | -0.000<br>(0.819) | 0.002<br>(0.000)  | 0.002<br>(0.000)  |
| Primary school (d)                                                           | 0.273<br>(0.000)  | 0.251<br>(0.000)  | 0.247<br>(0.000)  |
| High school (d)                                                              | -0.185            | -0.080            | -0.058            |

|                                                                        | Matching with... |                  |                  |
|------------------------------------------------------------------------|------------------|------------------|------------------|
|                                                                        | ...foreign MNC   |                  | ...domestic firm |
|                                                                        | Wage increase    | No wage increase | No wage increase |
|                                                                        | (0.008)          | (0.089)          | (0.002)          |
| Short vocational training (d)                                          | -0.290           | -0.288           | -0.250           |
|                                                                        | (0.000)          | (0.000)          | (0.000)          |
| Medium long vocational training (d)                                    | -0.264           | -0.401           | -0.414           |
|                                                                        | (0.000)          | (0.000)          | (0.000)          |
| BA (d)                                                                 | -0.107           | -0.208           | -0.247           |
|                                                                        | (0.118)          | (0.000)          | (0.000)          |
| MA (d)                                                                 | -0.255           | -0.302           | -0.254           |
|                                                                        | (0.000)          | (0.000)          | (0.000)          |
| PhD (d)                                                                | -0.548           | -0.460           | -0.507           |
|                                                                        | (0.002)          | (0.000)          | (0.000)          |
| TMT member (d)                                                         | -0.860           | -0.721           | -0.411           |
|                                                                        | (0.002)          | (0.000)          | (0.000)          |
| Management team member (d)                                             | 0.228            | 0.214            | 0.194            |
|                                                                        | (0.001)          | (0.000)          | (0.000)          |
| Manager (d)                                                            | 0.084            | 0.154            | 0.064            |
|                                                                        | (0.091)          | (0.000)          | (0.000)          |
| 2nd quantile in hourly wage distribution (d)                           | -0.028           | -0.154           | -0.168           |
|                                                                        | (0.580)          | (0.000)          | (0.000)          |
| 3rd quantile in hourly wage distribution (d)                           | -0.041           | -0.158           | -0.277           |
|                                                                        | (0.409)          | (0.000)          | (0.000)          |
| 4th quantile in hourly wage distribution (d)                           | -0.070           | -0.239           | -0.465           |
|                                                                        | (0.266)          | (0.000)          | (0.000)          |
| Average gender wage gap at domestic firms                              | -0.473           | 0.664            | 0.105            |
|                                                                        | (0.445)          | (0.000)          | (0.000)          |
| Relative difference between foreign MNC and domestic firm hourly wages | -0.037           | 0.053            | -0.101           |
|                                                                        | (0.625)          | (0.465)          | (0.000)          |
| Firm age                                                               | -0.001           | 0.001            | 0.001            |

|                                               | Matching with...            |                             |                              |
|-----------------------------------------------|-----------------------------|-----------------------------|------------------------------|
|                                               | ...foreign MNC              |                             | ...domestic firm             |
|                                               | Wage increase               | No wage increase            | No wage increase             |
| ln'(# employees)                              | (0.182)<br>0.040<br>(0.444) | (0.134)<br>0.022<br>(0.581) | (0.002)<br>-0.172<br>(0.000) |
| ln'(# employees)2                             | -0.002<br>(0.631)           | 0.002<br>(0.638)            | 0.023<br>(0.000)             |
| Share highly educated employees               | 0.068<br>(0.416)            | -0.153<br>(0.021)           | -0.050<br>(0.043)            |
| # hierarchy levels relative to # of employees | 0.766<br>(0.000)            | 0.653<br>(0.000)            | -0.321<br>(0.000)            |
| Average years of tenure                       | -0.104<br>(0.008)           | -0.058<br>(0.002)           | -0.035<br>(0.000)            |
| Share foreign citizens                        | 0.453<br>(0.450)            | 0.729<br>(0.042)            | 0.523<br>(0.009)             |
| All control variables                         | Yes                         | Yes                         | Yes                          |
| # obs.                                        | 169856                      | 169856                      | 169856                       |

The base category is workers who moved to a domestic firm and did receive a wage increase. Our estimations additionally contain sets of industry, year and region dummy variables. (d) denotes dummy variables. P-values in parentheses. Standard errors are clustered at the industry-region-year level.

## References

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