Final Paper Appendix

Alisa Yang

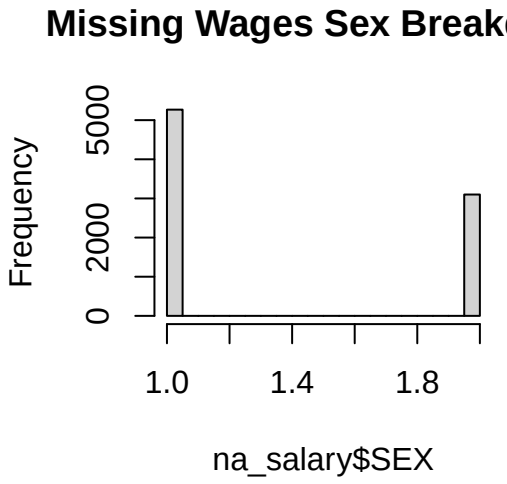
2022-12-14

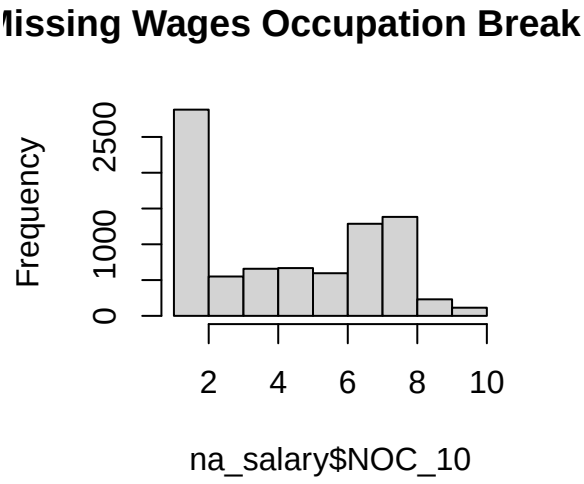
Appendix I: *Dropping missing values*

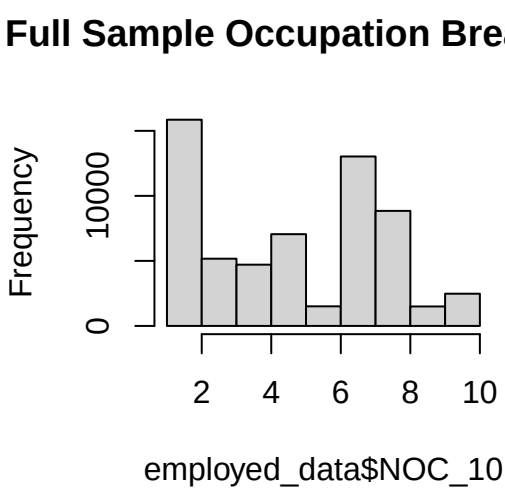
After running some histograms, we see that the missing values are around 33% female and the rest male, the sample population has around a 50-50 break down of the population, which suggest that the missing values might not be random. The occupation break down between the the missing wages group seems to be higher within group 1, which are "Management occupations". This isn't too surprising, since surveys tend to sensor things individuals with very high wages.

The full sample also had higher number of individual within the management occupation, so the sample shouldn't be too skewed after dropping the missing wages.

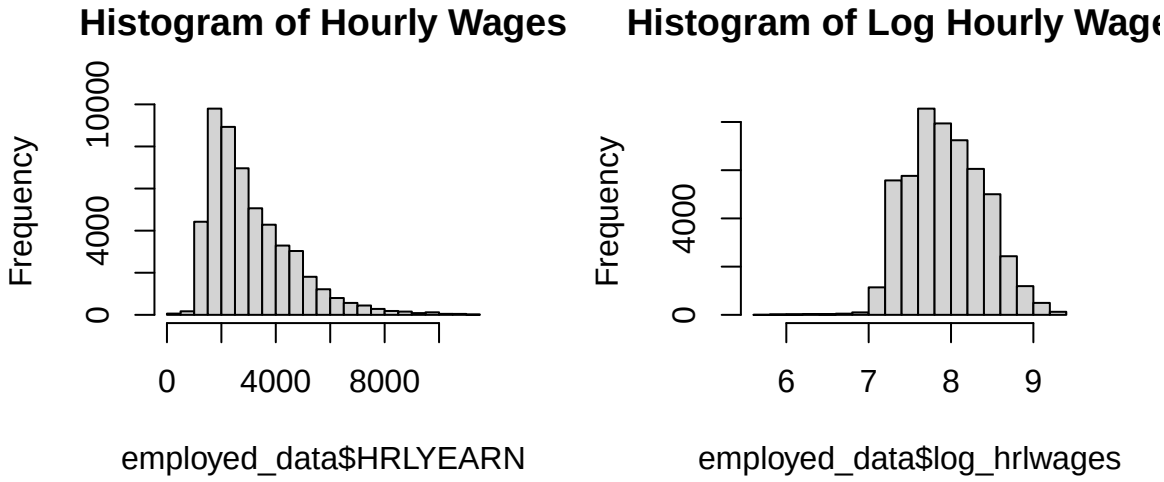
There are also a lot of missing data from other variables such as "lkpubag" which stands for "Unemployed, used public employment agency",in our case, these variables aren't applicable for our analysis so we don't need to worry about them.



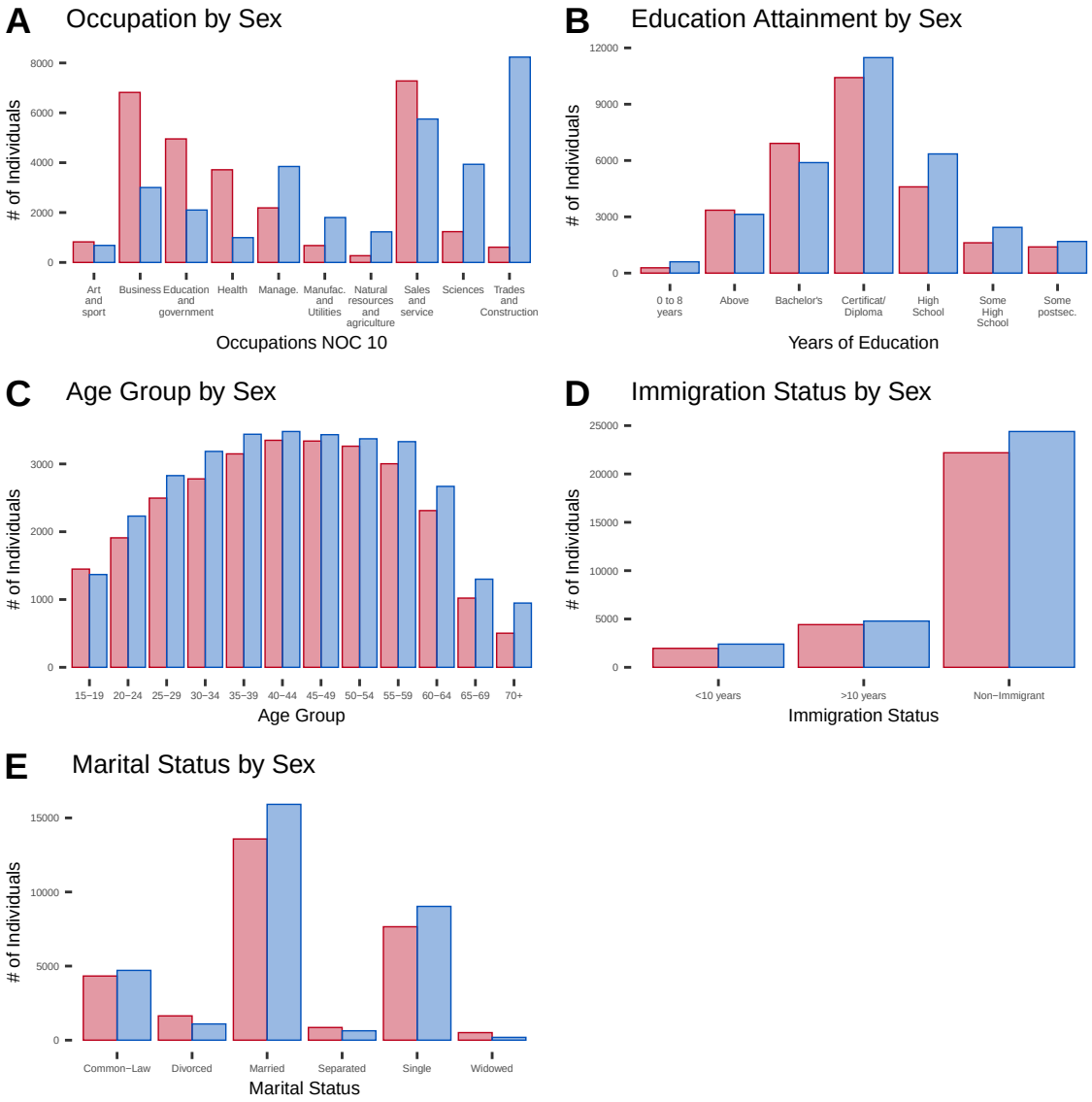




Appendix II: Histogram of Hourly Wages and Log Hourly Wages.



Appendix III: Extra Graphs



Appendix IV - *Dropping "SCHOOLN" and "AGYOWNK"* After dropping all of the missing (NAs) for the response variable, I had some missing values in the variables for "Age of youngest child" as well "current student status", if I included them, it would drop many of my other observations. We see that they aren't very relevant (thought they are statistically significant) after we account for age.

```
## Anova Table (Type III tests)
##
## Response: log_hrlwages
##                      Sum Sq    Df   F value    Pr(>F)
## (Intercept)          112.91     1 1353.5632 < 2.2e-16 ***
## as.factor(SEX)        29.56     1  354.4130 < 2.2e-16 ***
```

```
## as.factor(PROV)       51.78     9   68.9657 < 2.2e-16 ***
## as.factor(AGE_12)      7.40     9    9.8626 3.152e-15 ***
## as.factor(MARSTAT)     0.53     5    1.2795 0.2694873
## as.factor(EFAMTYPE)    1.75    10    2.0930 0.0216378 *
## as.factor(IMMIG)      22.84     2  136.9006 < 2.2e-16 ***
## as.factor(EDUC)       29.17     6   58.2872 < 2.2e-16 ***
## as.factor(NOC_40)    612.43    39  188.2507 < 2.2e-16 ***
## as.factor(NAICS_21)   75.05    20   44.9859 < 2.2e-16 ***
## TENURE                28.36     1  340.0192 < 2.2e-16 ***
## UTOTHRS                0.00     1    0.0493 0.8242648
## ATOTHRS                0.04     1    0.4241 0.5149162
## PAIDOT                 0.25     1    3.0153 0.0824997 .
## UNPAIDOT               4.27     1   51.2416 8.472e-13 ***
## as.factor(UNION)       2.04     2   12.2572 4.789e-06 ***
## as.factor(PERMTEMP)    9.56     3   38.1830 < 2.2e-16 ***
## as.factor(ESTSIZE)    15.18     3   60.6737 < 2.2e-16 ***
## as.factor(MJH)         1.27     1   15.2686 9.358e-05 ***
## as.factor(COWMAIN)     1.01     1   12.0481 0.0005196 ***
## as.factor(FIRMSIZE)    7.17     3   28.6408 < 2.2e-16 ***
## as.factor(AGYOWNK)     1.43     3    5.7210 0.0006565 ***
## as.factor(SCHOOLN)     1.54     2    9.2371 9.780e-05 ***
## Residuals           1551.39 18598
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Appendix V:

Data for the main anovas and coefficients from the main table in the paper. I didn't include them in the actual one since it will be too big.

```
##
## Call:
## lm(formula = log_hrlwages ~ as.factor(SEX), data = employed_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.14764 -0.34507 -0.02944  0.32977  1.44088
```

```
##
## Coefficients:
##                  Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3.388909   0.002823 1200.67   <2e-16 ***
## as.factor(SEX)2 -0.115314   0.004024  -28.65   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4578 on 51780 degrees of freedom
##   (8369 observations deleted due to missingness)
## Multiple R-squared:  0.01561,    Adjusted R-squared:  0.01559
## F-statistic: 821.1 on 1 and 51780 DF,  p-value: < 2.2e-16

##
## Call:
## lm(formula = log_hrlwages ~ as.factor(SEX) + as.factor(PROV) +
##     as.factor(AGE_12) + as.factor(MARSTAT) + as.factor(EFAMTYPE) +
##     as.factor(IMMIG), data = employed_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.25094 -0.27976 -0.02622  0.27221  1.65730
##
## Coefficients:
##                        Estimate Std. Error t value Pr(>|t|)
## (Intercept)            2.799245   0.018370 152.381  < 2e-16 ***
## as.factor(SEX)2       -0.113638   0.003743 -30.359  < 2e-16 ***
## as.factor(PROV)11     -0.051977   0.015807  -3.288 0.001009 **
## as.factor(PROV)12     -0.076150   0.012195  -6.245 4.28e-10 ***
## as.factor(PROV)13     -0.083694   0.011881  -7.045 1.88e-12 ***
## as.factor(PROV)24      0.051964   0.009852   5.274 1.34e-07 ***
## as.factor(PROV)35      0.103862   0.009433  11.010  < 2e-16 ***
## as.factor(PROV)46     -0.052287   0.011057  -4.729 2.26e-06 ***
## as.factor(PROV)47      0.004826   0.011400   0.423 0.672024
## as.factor(PROV)48      0.090294   0.010998   8.210 2.27e-16 ***
## as.factor(PROV)59      0.105368   0.010262  10.268  < 2e-16 ***
```

```
## as.factor(AGE_12)2     0.247403   0.010443  23.691  < 2e-16 ***
## as.factor(AGE_12)3     0.502233   0.010694  46.963  < 2e-16 ***
## as.factor(AGE_12)4     0.577982   0.010934  52.861  < 2e-16 ***
## as.factor(AGE_12)5     0.620385   0.010984  56.478  < 2e-16 ***
## as.factor(AGE_12)6     0.633716   0.011031  57.447  < 2e-16 ***
## as.factor(AGE_12)7     0.633848   0.011165  56.772  < 2e-16 ***
## as.factor(AGE_12)8     0.616494   0.011433  53.920  < 2e-16 ***
## as.factor(AGE_12)9     0.563781   0.011856  47.551  < 2e-16 ***
## as.factor(AGE_12)10    0.484071   0.012495  38.741  < 2e-16 ***
## as.factor(AGE_12)11    0.389510   0.014809  26.301  < 2e-16 ***
## as.factor(AGE_12)12    0.285071   0.018391  15.500  < 2e-16 ***
## as.factor(MARSTAT)2   -0.047224   0.005694  -8.293  < 2e-16 ***
## as.factor(MARSTAT)3   -0.134410   0.018707  -7.185 6.81e-13 ***
## as.factor(MARSTAT)4   -0.090893   0.013225  -6.873 6.37e-12 ***
## as.factor(MARSTAT)5   -0.058696   0.010818  -5.426 5.79e-08 ***
## as.factor(MARSTAT)6   -0.143307   0.007736 -18.526  < 2e-16 ***
## as.factor(EFAMTYPE)2  -0.059228   0.008451  -7.009 2.44e-12 ***
## as.factor(EFAMTYPE)3  -0.014641   0.008352  -1.753 0.079599 .
## as.factor(EFAMTYPE)4  -0.029593   0.009360  -3.162 0.001570 **
## as.factor(EFAMTYPE)5  -0.034491   0.011789  -2.926 0.003438 **
## as.factor(EFAMTYPE)6  -0.030153   0.012686  -2.377 0.017466 *
## as.factor(EFAMTYPE)7  -0.001114   0.019239  -0.058 0.953825
## as.factor(EFAMTYPE)8  -0.090016   0.012431  -7.241 4.50e-13 ***
## as.factor(EFAMTYPE)9  -0.075063   0.020329  -3.692 0.000222 ***
## as.factor(EFAMTYPE)10 -0.071425   0.023401  -3.052 0.002273 **
## as.factor(EFAMTYPE)11 -0.187490   0.019223  -9.753  < 2e-16 ***
## as.factor(EFAMTYPE)12 -0.093865   0.062269  -1.507 0.131710
## as.factor(EFAMTYPE)13 -0.075168   0.051395  -1.463 0.143593
## as.factor(EFAMTYPE)14 -0.036361   0.010243  -3.550 0.000386 ***
## as.factor(EFAMTYPE)15 -0.032306   0.013870  -2.329 0.019851 *
## as.factor(EFAMTYPE)16 -0.123724   0.043707  -2.831 0.004646 **
## as.factor(EFAMTYPE)17 -0.085827   0.041203  -2.083 0.037252 *
## as.factor(EFAMTYPE)18 -0.112312   0.007894 -14.228  < 2e-16 ***
## as.factor(IMMIG)2      0.075029   0.008237   9.109  < 2e-16 ***
## as.factor(IMMIG)3      0.134591   0.007011  19.197  < 2e-16 ***
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4045 on 51736 degrees of freedom
##   (8369 observations deleted due to missingness)
## Multiple R-squared:  0.2323, Adjusted R-squared:  0.2316
## F-statistic: 347.9 on 45 and 51736 DF,  p-value: < 2.2e-16

##
## Call:
## lm(formula = log_hrlwages ~ as.factor(SEX) + as.factor(PROV) +
##     as.factor(AGE_12) + as.factor(MARSTAT) + as.factor(EFAMTYPE) +
##     as.factor(IMMIG) + as.factor(EDUC), data = employed_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.48715 -0.24328 -0.01032  0.24355  1.79807
##
## Coefficients:
##                        Estimate Std. Error t value Pr(>|t|)
## (Intercept)            2.612980   0.022124 118.105  < 2e-16 ***
## as.factor(SEX)2       -0.144454   0.003512 -41.136  < 2e-16 ***
## as.factor(PROV)11     -0.050014   0.014749  -3.391 0.000697 ***
## as.factor(PROV)12     -0.072887   0.011381  -6.404 1.52e-10 ***
## as.factor(PROV)13     -0.065906   0.011091  -5.942 2.83e-09 ***
## as.factor(PROV)24      0.053839   0.009194   5.856 4.78e-09 ***
## as.factor(PROV)35      0.095134   0.008809  10.800  < 2e-16 ***
## as.factor(PROV)46     -0.024615   0.010333  -2.382 0.017214 *
## as.factor(PROV)47      0.030646   0.010649   2.878 0.004006 **
## as.factor(PROV)48      0.122820   0.010273  11.955  < 2e-16 ***
## as.factor(PROV)59      0.105927   0.009585  11.052  < 2e-16 ***
## as.factor(AGE_12)2     0.124137   0.010250  12.111  < 2e-16 ***
## as.factor(AGE_12)3     0.297014   0.010652  27.884  < 2e-16 ***
## as.factor(AGE_12)4     0.367999   0.010886  33.806  < 2e-16 ***
## as.factor(AGE_12)5     0.418654   0.010900  38.409  < 2e-16 ***
## as.factor(AGE_12)6     0.440289   0.010923  40.310  < 2e-16 ***
## as.factor(AGE_12)7     0.446344   0.011020  40.505  < 2e-16 ***
```

```
## as.factor(AGE_12)8     0.445074   0.011197  39.751  < 2e-16 ***
## as.factor(AGE_12)9     0.408922   0.011542  35.428  < 2e-16 ***
## as.factor(AGE_12)10    0.353136   0.012043  29.323  < 2e-16 ***
## as.factor(AGE_12)11    0.258909   0.014128  18.326  < 2e-16 ***
## as.factor(AGE_12)12    0.154085   0.017388   8.861  < 2e-16 ***
## as.factor(MARSTAT)2   -0.011759   0.005330  -2.206 0.027363 *
## as.factor(MARSTAT)3   -0.069944   0.017468  -4.004 6.23e-05 ***
## as.factor(MARSTAT)4   -0.050642   0.012348  -4.101 4.11e-05 ***
## as.factor(MARSTAT)5   -0.036523   0.010100  -3.616 0.000299 ***
## as.factor(MARSTAT)6   -0.107843   0.007231 -14.914  < 2e-16 ***
## as.factor(EFAMTYPE)2  -0.040298   0.007887  -5.109 3.25e-07 ***
## as.factor(EFAMTYPE)3  -0.005344   0.007795  -0.686 0.493026
## as.factor(EFAMTYPE)4  -0.017396   0.008739  -1.991 0.046539 *
## as.factor(EFAMTYPE)5  -0.013133   0.011001  -1.194 0.232573
## as.factor(EFAMTYPE)6   0.001060   0.011846   0.090 0.928676
## as.factor(EFAMTYPE)7  -0.001188   0.017949  -0.066 0.947222
## as.factor(EFAMTYPE)8  -0.051118   0.011606  -4.404 1.06e-05 ***
## as.factor(EFAMTYPE)9  -0.054587   0.018968  -2.878 0.004006 **
## as.factor(EFAMTYPE)10 -0.060401   0.021835  -2.766 0.005672 **
## as.factor(EFAMTYPE)11 -0.147731   0.017939  -8.235  < 2e-16 ***
## as.factor(EFAMTYPE)12 -0.051747   0.058092  -0.891 0.373053
## as.factor(EFAMTYPE)13 -0.087119   0.047944  -1.817 0.069208 .
## as.factor(EFAMTYPE)14 -0.010321   0.009565  -1.079 0.280569
## as.factor(EFAMTYPE)15 -0.011226   0.012945  -0.867 0.385833
## as.factor(EFAMTYPE)16 -0.072751   0.040780  -1.784 0.074432 .
## as.factor(EFAMTYPE)17 -0.046173   0.038443  -1.201 0.229728
## as.factor(EFAMTYPE)18 -0.067214   0.007382  -9.105  < 2e-16 ***
## as.factor(IMMIG)2      0.097978   0.007695  12.732  < 2e-16 ***
## as.factor(IMMIG)3      0.199913   0.006602  30.283  < 2e-16 ***
## as.factor(EDUC)1       0.040308   0.015745   2.560 0.010469 *
## as.factor(EDUC)2       0.116797   0.014863   7.858 3.97e-15 ***
## as.factor(EDUC)3       0.145335   0.016125   9.013  < 2e-16 ***
## as.factor(EDUC)4       0.243559   0.014635  16.642  < 2e-16 ***
## as.factor(EDUC)5       0.439615   0.014879  29.546  < 2e-16 ***
## as.factor(EDUC)6       0.575731   0.015345  37.519  < 2e-16 ***
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3773 on 51730 degrees of freedom
##   (8369 observations deleted due to missingness)
## Multiple R-squared:  0.332,  Adjusted R-squared:  0.3314
## F-statistic: 504.2 on 51 and 51730 DF,  p-value: < 2.2e-16

##
## Call:
## lm(formula = log_hrlwages ~ as.factor(SEX) + as.factor(PROV) +
##     as.factor(AGE_12) + as.factor(MARSTAT) + as.factor(EFAMTYPE) +
##     as.factor(IMMIG) + as.factor(EDUC) + as.factor(NOC_40) +
##     as.factor(NAICS_21) + TENURE + UTOTHRS + ATOTHRS + PAIDOT +
##     UNPAIDOT + as.factor(UNION) + as.factor(PERMTEMP) + as.factor(ESTSIZE) +
##     as.factor(MJH) + as.factor(COWMAIN) + as.factor(FIRMSIZE),
##     data = employed_data)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.4263 -0.1623 -0.0035  0.1627  1.4699
##
## Coefficients:
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)             3.359e+00  3.566e-02  94.215  < 2e-16 ***
## as.factor(SEX)2        -7.723e-02  3.112e-03 -24.816  < 2e-16 ***
## as.factor(PROV)11      -3.422e-02  1.127e-02  -3.038 0.002384 **
## as.factor(PROV)12      -4.763e-02  8.688e-03  -5.483 4.21e-08 ***
## as.factor(PROV)13      -5.611e-02  8.464e-03  -6.629 3.41e-11 ***
## as.factor(PROV)24       3.850e-02  7.070e-03   5.445 5.19e-08 ***
## as.factor(PROV)35       7.323e-02  6.766e-03  10.822  < 2e-16 ***
## as.factor(PROV)46      -3.096e-02  7.908e-03  -3.915 9.05e-05 ***
## as.factor(PROV)47       1.799e-02  8.137e-03   2.211 0.027074 *
## as.factor(PROV)48       1.022e-01  7.860e-03  13.009  < 2e-16 ***
## as.factor(PROV)59       1.134e-01  7.342e-03  15.449  < 2e-16 ***
## as.factor(AGE_12)2     -2.272e-03  8.120e-03  -0.280 0.779676
## as.factor(AGE_12)3      7.996e-02  8.663e-03   9.230  < 2e-16 ***
```

```
## as.factor(AGE_12)4     1.160e-01  8.877e-03  13.068  < 2e-16 ***
## as.factor(AGE_12)5     1.443e-01  8.923e-03  16.178  < 2e-16 ***
## as.factor(AGE_12)6     1.528e-01  8.973e-03  17.029  < 2e-16 ***
## as.factor(AGE_12)7     1.527e-01  9.089e-03  16.795  < 2e-16 ***
## as.factor(AGE_12)8     1.458e-01  9.231e-03  15.789  < 2e-16 ***
## as.factor(AGE_12)9     1.292e-01  9.484e-03  13.620  < 2e-16 ***
## as.factor(AGE_12)10    1.079e-01  9.814e-03  10.999  < 2e-16 ***
## as.factor(AGE_12)11    6.734e-02  1.123e-02   5.997 2.02e-09 ***
## as.factor(AGE_12)12    1.105e-02  1.363e-02   0.811 0.417378
## as.factor(MARSTAT)2   -8.900e-03  4.063e-03  -2.191 0.028479 *
## as.factor(MARSTAT)3   -3.089e-02  1.330e-02  -2.322 0.020226 *
## as.factor(MARSTAT)4   -3.472e-02  9.400e-03  -3.693 0.000222 ***
## as.factor(MARSTAT)5   -1.318e-02  7.696e-03  -1.713 0.086733 .
## as.factor(MARSTAT)6   -5.841e-02  5.520e-03 -10.581  < 2e-16 ***
## as.factor(EFAMTYPE)2  -2.278e-02  6.013e-03  -3.789 0.000151 ***
## as.factor(EFAMTYPE)3  -4.293e-03  5.948e-03  -0.722 0.470440
## as.factor(EFAMTYPE)4  -1.561e-02  6.661e-03  -2.344 0.019089 *
## as.factor(EFAMTYPE)5  -1.298e-02  8.384e-03  -1.549 0.121479
## as.factor(EFAMTYPE)6   1.745e-03  9.025e-03   0.193 0.846700
## as.factor(EFAMTYPE)7  -1.152e-02  1.367e-02  -0.843 0.399476
## as.factor(EFAMTYPE)8  -2.312e-02  8.852e-03  -2.612 0.008992 **
## as.factor(EFAMTYPE)9  -3.057e-02  1.444e-02  -2.117 0.034287 *
## as.factor(EFAMTYPE)10 -4.563e-02  1.663e-02  -2.745 0.006060 **
## as.factor(EFAMTYPE)11 -5.704e-02  1.367e-02  -4.174 3.00e-05 ***
## as.factor(EFAMTYPE)12  2.010e-02  4.423e-02   0.455 0.649466
## as.factor(EFAMTYPE)13 -7.381e-02  3.650e-02  -2.022 0.043178 *
## as.factor(EFAMTYPE)14 -1.204e-03  7.288e-03  -0.165 0.868773
## as.factor(EFAMTYPE)15 -2.910e-03  9.857e-03  -0.295 0.767846
## as.factor(EFAMTYPE)16 -2.727e-02  3.105e-02  -0.878 0.379729
## as.factor(EFAMTYPE)17 -3.136e-02  2.926e-02  -1.072 0.283895
## as.factor(EFAMTYPE)18 -2.796e-02  5.624e-03  -4.972 6.65e-07 ***
## as.factor(IMMIG)2      2.508e-02  5.884e-03   4.262 2.03e-05 ***
## as.factor(IMMIG)3      7.376e-02  5.139e-03  14.353  < 2e-16 ***
## as.factor(EDUC)1       2.551e-02  1.201e-02   2.125 0.033625 *
## as.factor(EDUC)2       4.485e-02  1.137e-02   3.945 8.00e-05 ***
## as.factor(EDUC)3       5.945e-02  1.235e-02   4.812 1.50e-06 ***
```

```
## as.factor(EDUC)4       7.528e-02  1.126e-02   6.685 2.33e-11 ***
## as.factor(EDUC)5       1.255e-01  1.158e-02  10.839  < 2e-16 ***
## as.factor(EDUC)6       1.777e-01  1.208e-02  14.710  < 2e-16 ***
## as.factor(NOC_40)2    -6.590e-02  2.153e-02  -3.061 0.002208 **
## as.factor(NOC_40)3    -2.442e-01  2.346e-02 -10.410  < 2e-16 ***
## as.factor(NOC_40)4    -2.101e-01  2.311e-02  -9.092  < 2e-16 ***
## as.factor(NOC_40)5    -3.092e-01  2.162e-02 -14.298  < 2e-16 ***
## as.factor(NOC_40)6    -5.483e-01  2.135e-02 -25.678  < 2e-16 ***
## as.factor(NOC_40)7    -5.391e-01  2.363e-02 -22.812  < 2e-16 ***
## as.factor(NOC_40)8    -6.595e-01  2.181e-02 -30.244  < 2e-16 ***
## as.factor(NOC_40)9    -7.317e-01  2.330e-02 -31.396  < 2e-16 ***
## as.factor(NOC_40)10   -2.157e-01  2.142e-02 -10.071  < 2e-16 ***
## as.factor(NOC_40)11   -4.564e-01  2.186e-02 -20.874  < 2e-16 ***
## as.factor(NOC_40)12   -2.006e-01  2.312e-02  -8.679  < 2e-16 ***
## as.factor(NOC_40)13   -1.165e-01  2.438e-02  -4.779 1.77e-06 ***
## as.factor(NOC_40)14   -4.057e-01  2.291e-02 -17.706  < 2e-16 ***
## as.factor(NOC_40)15   -6.552e-01  2.293e-02 -28.579  < 2e-16 ***
## as.factor(NOC_40)16   -2.952e-01  2.236e-02 -13.199  < 2e-16 ***
## as.factor(NOC_40)17   -2.867e-01  2.211e-02 -12.965  < 2e-16 ***
## as.factor(NOC_40)18   -5.829e-01  2.280e-02 -25.561  < 2e-16 ***
## as.factor(NOC_40)19   -2.571e-01  2.626e-02  -9.792  < 2e-16 ***
## as.factor(NOC_40)20   -6.420e-01  2.344e-02 -27.387  < 2e-16 ***
## as.factor(NOC_40)21   -4.197e-01  2.751e-02 -15.258  < 2e-16 ***
## as.factor(NOC_40)22   -5.619e-01  2.395e-02 -23.460  < 2e-16 ***
## as.factor(NOC_40)23   -6.257e-01  2.218e-02 -28.208  < 2e-16 ***
## as.factor(NOC_40)24   -7.276e-01  2.244e-02 -32.421  < 2e-16 ***
## as.factor(NOC_40)25   -6.905e-01  2.206e-02 -31.296  < 2e-16 ***
## as.factor(NOC_40)26   -7.204e-01  2.206e-02 -32.660  < 2e-16 ***
## as.factor(NOC_40)27   -7.973e-01  2.255e-02 -35.363  < 2e-16 ***
## as.factor(NOC_40)28   -7.873e-01  2.188e-02 -35.987  < 2e-16 ***
## as.factor(NOC_40)29   -4.885e-01  2.213e-02 -22.073  < 2e-16 ***
## as.factor(NOC_40)30   -4.607e-01  2.209e-02 -20.855  < 2e-16 ***
## as.factor(NOC_40)31   -7.296e-01  2.342e-02 -31.160  < 2e-16 ***
## as.factor(NOC_40)32   -6.724e-01  2.218e-02 -30.319  < 2e-16 ***
## as.factor(NOC_40)33   -6.678e-01  2.489e-02 -26.825  < 2e-16 ***
## as.factor(NOC_40)34   -5.255e-01  2.620e-02 -20.061  < 2e-16 ***
```

```
## as.factor(NOC_40)35   -6.236e-01  3.105e-02 -20.081  < 2e-16 ***
## as.factor(NOC_40)36   -6.596e-01  2.688e-02 -24.537  < 2e-16 ***
## as.factor(NOC_40)37   -4.850e-01  2.449e-02 -19.807  < 2e-16 ***
## as.factor(NOC_40)38   -7.717e-01  2.356e-02 -32.759  < 2e-16 ***
## as.factor(NOC_40)39   -7.548e-01  2.485e-02 -30.369  < 2e-16 ***
## as.factor(NOC_40)40   -8.482e-01  2.623e-02 -32.338  < 2e-16 ***
## as.factor(NAICS_21)2   2.406e-01  2.846e-02   8.456  < 2e-16 ***
## as.factor(NAICS_21)3  -1.199e-02  4.996e-02  -0.240 0.810296
## as.factor(NAICS_21)4   3.991e-01  2.231e-02  17.892  < 2e-16 ***
## as.factor(NAICS_21)5   3.586e-01  2.554e-02  14.043  < 2e-16 ***
## as.factor(NAICS_21)6   2.736e-01  2.247e-02  12.174  < 2e-16 ***
## as.factor(NAICS_21)7   2.063e-01  2.267e-02   9.102  < 2e-16 ***
## as.factor(NAICS_21)8   1.716e-01  2.283e-02   7.517 5.72e-14 ***
## as.factor(NAICS_21)9   2.172e-01  2.302e-02   9.437  < 2e-16 ***
## as.factor(NAICS_21)10  3.289e-02  2.245e-02   1.465 0.142829
## as.factor(NAICS_21)11  1.895e-01  2.273e-02   8.337  < 2e-16 ***
## as.factor(NAICS_21)12  2.233e-01  2.274e-02   9.821  < 2e-16 ***
## as.factor(NAICS_21)13  1.640e-01  2.457e-02   6.675 2.49e-11 ***
## as.factor(NAICS_21)14  2.258e-01  2.245e-02  10.059  < 2e-16 ***
## as.factor(NAICS_21)15  1.155e-01  2.276e-02   5.075 3.88e-07 ***
## as.factor(NAICS_21)16  1.040e-01  2.328e-02   4.465 8.03e-06 ***
## as.factor(NAICS_21)17  9.222e-02  2.255e-02   4.089 4.34e-05 ***
## as.factor(NAICS_21)18  1.235e-01  2.282e-02   5.412 6.26e-08 ***
## as.factor(NAICS_21)19  6.657e-02  2.283e-02   2.916 0.003547 **
## as.factor(NAICS_21)20  1.246e-01  2.290e-02   5.441 5.33e-08 ***
## as.factor(NAICS_21)21  2.103e-01  2.291e-02   9.179  < 2e-16 ***
## TENURE                 5.821e-04  1.873e-05  31.083  < 2e-16 ***
## UTOTHRS                2.253e-05  2.364e-05   0.953 0.340520
## ATOTHRS                7.767e-05  2.136e-05   3.635 0.000278 ***
## PAIDOT                 1.926e-04  3.878e-05   4.968 6.79e-07 ***
## UNPAIDOT               6.397e-04  4.941e-05  12.946  < 2e-16 ***
## as.factor(UNION)2     -1.577e-02  9.045e-03  -1.744 0.081188 .
## as.factor(UNION)3     -5.259e-02  3.832e-03 -13.722  < 2e-16 ***
## as.factor(PERMTEMP)2  -5.598e-02  8.280e-03  -6.761 1.39e-11 ***
## as.factor(PERMTEMP)3  -6.734e-02  5.551e-03 -12.132  < 2e-16 ***
## as.factor(PERMTEMP)4  -6.266e-02  7.388e-03  -8.481  < 2e-16 ***
```

```
## as.factor(ESTSIZE)2    2.378e-02  4.232e-03   5.619 1.94e-08 ***
## as.factor(ESTSIZE)3    6.013e-02  4.707e-03  12.775  < 2e-16 ***
## as.factor(ESTSIZE)4    9.264e-02  5.249e-03  17.649  < 2e-16 ***
## as.factor(MJH)2       -4.163e-02  5.934e-03  -7.016 2.32e-12 ***
## as.factor(COWMAIN)2   -3.714e-02  5.518e-03  -6.731 1.71e-11 ***
## as.factor(FIRMSIZE)2   3.501e-02  5.507e-03   6.358 2.07e-10 ***
## as.factor(FIRMSIZE)3   4.804e-02  5.500e-03   8.734  < 2e-16 ***
## as.factor(FIRMSIZE)4   6.573e-02  5.092e-03  12.907  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.287 on 51653 degrees of freedom
##   (8369 observations deleted due to missingness)
## Multiple R-squared:  0.6142, Adjusted R-squared:  0.6132
## F-statistic: 642.3 on 128 and 51653 DF,  p-value: < 2.2e-16

## Anova Table (Type III tests)
##
## Response: log_hrlwages
##                Sum Sq    Df    F value    Pr(>F)
## (Intercept)    302163     1 1441598.54 < 2.2e-16 ***
## as.factor(SEX)    172     1     821.06 < 2.2e-16 ***
## Residuals       10853 51780
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Anova Table (Type III tests)
##
## Response: log_hrlwages
##                     Sum Sq    Df   F value    Pr(>F)
## (Intercept)         3798.9     1 23220.063 < 2.2e-16 ***
## as.factor(SEX)       150.8     1   921.669 < 2.2e-16 ***
## as.factor(PROV)      211.4     9   143.591 < 2.2e-16 ***
## as.factor(AGE_12)    885.1    11   491.819 < 2.2e-16 ***
## as.factor(MARSTAT)    61.7     5    75.479 < 2.2e-16 ***
## as.factor(EFAMTYPE)   62.0    17    22.296 < 2.2e-16 ***
```

```
## as.factor(IMMIG)      72.7     2   222.050 < 2.2e-16 ***
## Residuals           8464.2 51736
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Anova Table (Type III tests)
##
## Response: log_hrlwages
##                     Sum Sq    Df   F value    Pr(>F)
## (Intercept)         1985.8     1 13948.864 < 2.2e-16 ***
## as.factor(SEX)       240.9     1  1692.181 < 2.2e-16 ***
## as.factor(PROV)      173.5     9   135.435 < 2.2e-16 ***
## as.factor(AGE_12)    437.8    11   279.561 < 2.2e-16 ***
## as.factor(MARSTAT)    34.4     5    48.348 < 2.2e-16 ***
## as.factor(EFAMTYPE)   29.8    17    12.309 < 2.2e-16 ***
## as.factor(IMMIG)     167.6     2   588.650 < 2.2e-16 ***
## as.factor(EDUC)     1099.7     6  1287.415 < 2.2e-16 ***
## Residuals           7364.5 51730
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Anova Table (Type III tests)
##
## Response: log_hrlwages
##                     Sum Sq    Df   F value    Pr(>F)
## (Intercept)          731.1     1 8876.4478 < 2.2e-16 ***
## as.factor(SEX)        50.7     1  615.8119 < 2.2e-16 ***
## as.factor(PROV)      129.3     9  174.4930 < 2.2e-16 ***
## as.factor(AGE_12)     69.6    11   76.8076 < 2.2e-16 ***
## as.factor(MARSTAT)    10.3     5   25.0642 < 2.2e-16 ***
## as.factor(EFAMTYPE)    6.1    17    4.3697 3.964e-09 ***
## as.factor(IMMIG)      25.7     2  156.0386 < 2.2e-16 ***
## as.factor(EDUC)       60.8     6  123.1247 < 2.2e-16 ***
## as.factor(NOC_40)   1393.3    39  433.7730 < 2.2e-16 ***
## as.factor(NAICS_21)  196.4    20  119.2231 < 2.2e-16 ***
## TENURE                79.6     1  966.1665 < 2.2e-16 ***
```

```
## UTOTHRS                0.1     1    0.9085 0.3405205
## ATOTHRS                1.1     1   13.2168 0.0002777 ***
## PAIDOT                 2.0     1   24.6792 6.793e-07 ***
## UNPAIDOT              13.8     1  167.5863 < 2.2e-16 ***
## as.factor(UNION)      15.7     2   95.3144 < 2.2e-16 ***
## as.factor(PERMTEMP)   19.0     3   76.7132 < 2.2e-16 ***
## as.factor(ESTSIZE)    30.4     3  122.8376 < 2.2e-16 ***
## as.factor(MJH)         4.1     1   49.2198 2.316e-12 ***
## as.factor(COWMAIN)     3.7     1   45.3010 1.707e-11 ***
## as.factor(FIRMSIZE)   14.5     3   58.7111 < 2.2e-16 ***
## Residuals           4254.1 51653
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```