

Why do women get lower pay

Tomas Dosedel, 365877

In this assignment I will perform multivariate analysis of Czech Household Panel Survey data in order to answer the research question “Which determinants influence the income of men and women?” The dependent variable – income – is coded as a gross hourly income in Czech Crowns. Because the distribution of income is not normal, which is the basic assumption of linear regression, it is usually converted into natural logarithm of income [c. f. Doseděl, Katriňák 2017]. Using natural logarithm of dependent variable means that the regression coefficient can be interpreted directly as a per cent change [Benoit 2011; Princeton 2015].

The independent variables include gender of the respondent (male, female), attained educational level (recoded into primary, vocational, secondary, bachelor, master), marital status (recoded into married, not married, never married) and the length of work experiences. The results are presented in table 1.

In model M1, the only independent variable is a gender of a respondent. As shown in table 1, if a respondent is female, her income will be 24.5 per cent lower in comparison with the income of male. This is consistent with the findings of Eurostat [2018]. In model M2, except from gender, also the attained educational level is used. Table 1 shows that the higher education the respondent attains, the higher his or her income will be. For example employers with master degree have by 119 per cent higher income in comparison with primary educated people.

In next two steps I added work experiences (in model M3) and marital status (in model M4). The quality of the respective models are slightly rising (from 0.01 for model M1 up to 0.08 for model M4). The influence of the work experience seems to be very weak, but it is important to realize that the coefficient show the percentual change for every year of work experience, so for average 40-years long work career, the influence changes from 0.000 per cent to 1,028 per cent because of the compound interest.

Into the final model M5 I added the interaction between gender and educational level, because from literature review I know that the education work differently for men and women. The final model is slightly better than model M4 (R-squared is 0.082). Very interesting is the decrease in the influence of gender itself (from 0.264 down to 0.061) which mean, that the great part of gender differences in income are because of the education, not the gender itself.

The influence of marital status can be interpreted as follows. Divorced and widowed people get slightly higher salary than people who are currently married. People, who were never married, have slightly lower income in comparison with people who are currently married, even when controlling for age and education (i. e. the difference is not caused by the lower age of single people or higher age of divorced/widowed people).

Table 1: Determinants of income (OLS regression)

		M1	M2	M3	M4	M5
Gender	Male	Ref.	Ref.	Ref.	Ref.	Ref.
	Female	-0.245 ***	-0.249 ***	-0.251 ***	-0.264 ***	-0,061
Education	Primary		Ref.	Ref.	Ref.	Ref.
	Vocational		0.594 ***	0.591 ***	0.585 ***	0.554 ***
	Secondary		0.894 ***	0.919 ***	0.914 ***	0.905 ***
	Bachelor		0.913 ***	1.036 ***	1.023 ***	1.091 ***
	Master		1.190 ***	1.243 ***	1.238 ***	1.273 ***
Work experiences			0.006 ***	0.005 ***	0.006 ***	
Marital status	Married				Ref.	Ref.
	Not married				0.072	0.065
	Never married				-0.023	-0.015
Gender * Education	Primary, Man					Ref.
	Vocational, woman					-0.164
	Secondary, woman					-0.185
	Bachelor, woman					-0.309
	Master, woman					-0.270
Cons.		4.914 ***	4.078 ***	3.914 ***	3.937 ***	3.937 ***
N		2,942	2,942	2,942	2,942	2,942
R ²		0.0134	0.0761	0.0807	0,0815	0.0822

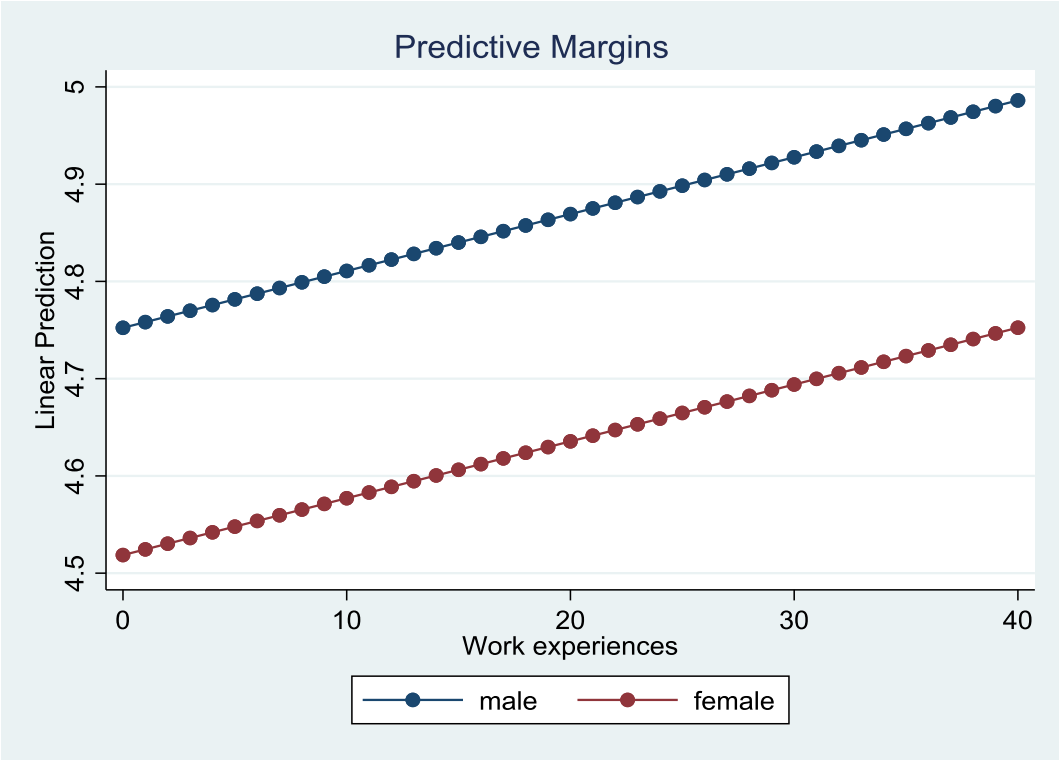
Source: CHPS 2015

Graph 1 shows the marginal effects of work experiences on log income by gender of the respondent. Graph 2 shows the marginal effects of work experiences on log income by education level attained by the respondent.

From these two graphs and model M5 presented in table 1, I can answer my research question and test my hypotheses. Hypothesis 1 assumed that **the higher the education is, the higher income will one get**. As seen is graph 2, this hypothesis cannot be rejected, because respondents with higher educational level are getting higher incomes. Hypothesis 2 assumed that **the income is positively connected with age – the more work experiences one gets, the higher his or her income is**. Both graphs 1 and 2 support this hypothesis – the income is rising as the number of year of work experiences rise. Hypothesis 3 assumed that **people in marriage will get higher salaries**. As shown in table 1, model M5, people who are currently married get 6.5 per cent lower salaries in comparison with people who are widowed or divorced, but 1.5 per cent higher income in comparison with people who were never married. Therefore his hypothesis can be rejected only partially.

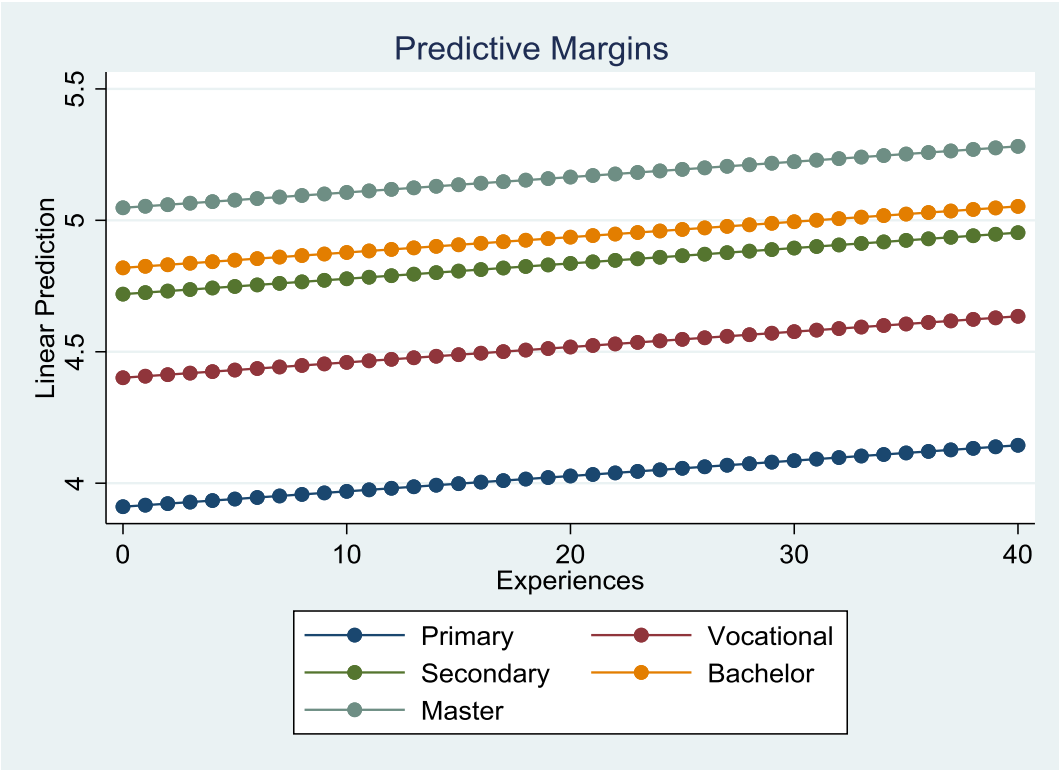
The answer to main research question **Which determinants influence the income of men and women?** Is: the main determinants of income are the educational level and the length of work experiences. The influence of gender is mainly mediated through education.

Graph 1: How work experiences influence income for different gender



Source: CHPS 2015

Graph 2: How work experiences influence income for different educational level



Source:

CHPS 2015

References:

Benoit, K. 2011. *Linear Regression Models with Logarithmic Transformations*. [online]. London: London School of Economics [cit. 28. 04. 2018]. Available at: <http://www.kenbenoit.net/courses/ME104/logmodels2.pdf>.

Doseděl, T. T. Katrňák. 2017. *Economic and Non-economic Returns to Higher Education during the Educational Expansion in the Czech Republic*. Sociologický časopis 53.5: 693-718. Praha: Sociologický ústav.

Princeton. 2015. „Log Transformation.“ *Data and Statistical Services* [online]. Princeton: Princeton University Library. [cit. 28. 04. 2018]. Available at: http://dss.princeton.edu/online_help/stats_packages/stata/log.html.