

Wages regression exercise 2

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For Friday, September 18, please. Again I'm asking you to submit your answers in the form of a PDF file via Canvas: look under Assignments for "Wage Regression 2". This exercise uses the same data file as the previous one, `eurowages.gdt`.

1. Add the square of `exper` and the log of wage to the dataset.
2. Estimate a model with the log of wage as dependent variable and `educ`, `exper`, the square of `exper`, and `male` as independent (also include an intercept).
3. Add a new series: the product of `educ` and `male`, as in

```
series male_educ = male * educ
```

A variable of this sort is known as an *interaction term*.

4. Re-estimate the model from step 2 with the addition of the interaction term: is it statistically significant at the 5 percent level? Does it improve the model?
5. Using the estimates from step 4, perform the following pair of comparisons. First, determine the predicted log wage for (a) a woman with an `educ` level of 3 and 10 years of experience and (b) a man with the same education and experience levels. Second, repeat the exercise but using an `educ` level of 5.

Method for step 5: Use matrix multiplication: that is, multiply a row vector representing the specified characteristics into the vector of estimated coefficients. The characteristics must appear in the same order as the regressors—so if `educ` appears second in the model, the `educ` value must be the second element in the vector. Here's an example for a woman with education level 2 and 5 years of experience (the first 1 is for the intercept):

```
matrix b = $coeff # do this once after estimating the model
matrix e2f = {1, 2, 5, 25, 0, 0}
prediction = e2f * b
```

Note that for a man the last two elements of the characteristics vector would be different.

6. Based on your results, what information is the coefficient on the interaction term giving you?