

# Errata for “MPhil Econometrics – Limited Dependent Variables and Selection”

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This document contains errata for my lecture slides. The times and dates given below refer to the *most recent version* of the document that contained the error. Subsequent versions have been corrected.

**Version: 2020-02-02 at 17:11:59**

- Slides 6–7
  - I originally forgot to include the limits at infinity and minus infinity as assumptions of the index model. These have been added to slide 6, and slide 7 now refers back to them.
- Slide 9
  - At the bottom-left of the slide, the partial effect for Probit was incorrect:  $\exp\{-\mathbf{x}'\boldsymbol{\beta}/2\}$  has been corrected to  $\exp\{-(\mathbf{x}'\boldsymbol{\beta})^2/2\}$
- Slide 16
  - In Step 4, the original expression forgot to condition on  $\mathbf{x}_i$ . I’ve added “ $|\mathbf{x}_i$ ” to the inner expectation to correct this.
- Slide 19
  - Added a sentence about why I don’t like pseudo R-squared. You’ll learn more on the problem set!

**Version: 2020-01-30 at 12:34:30** One of these typos is arguably **major**.

- Lecture 2
  - Slide 4: In the first order condition at the bottom of the slide, two instances of  $\mathbf{x}'y$  have been changed to  $\mathbf{x}y$ .
  - Slide 9: Under the heading “Sample” in the left column,  $\boldsymbol{\theta}_o$  has been changed to  $\widehat{\boldsymbol{\theta}}$ .
  - Slide 19: In the expression for  $\mathbf{K}$ ,  $\mathbf{x}_i\mathbf{x}_i'$  was missing from the third equality. It has been added.
  - Slide 20: The inequality for Underdispersion ran the wrong way:  $\sigma^2 > 1$  has been corrected to  $\sigma^2 < 1$ .

**Version: 2020-01-29 at 12:10:36**

- Lecture 1
  - The definition of  $s_y^2$  on slide 20 was incorrect:  $(y_i - \bar{y})$  has been corrected to  $(y_i - \bar{y})^2$ .

**Version: 2020-01-28 at 12:10:09** Major errors are **indicated in red** and a “meta-erratum,” i.e. something that I *said* was an error in lecture but is in fact correct, is **indicated in blue**.

- Lecture 1
  - Slide 15: “ $\boldsymbol{\theta}_o$  is consistent for  $\boldsymbol{\theta}_o$ ” has been corrected to “ $\widehat{\boldsymbol{\theta}}$  is consistent for  $\boldsymbol{\theta}_o$ ”
- Lecture 2
  - Slide 2: In the bottom-most displayed equation there is a  $\boldsymbol{\beta}$ . In class I said that this should be a  $\boldsymbol{\theta}$  but I was wrong. Here  $\boldsymbol{\theta}$  is being used to indicate a vector of *arbitrary* parameter values while  $\boldsymbol{\beta}$  is being used to indicate a *particular* vector of parameter values: the solution to the population least-squares problem.
  - Slide 4: in the middle displayed equation,  $(\mathbf{A} + \mathbf{A}')\mathbf{x}$  has been corrected to  $(\mathbf{A} + \mathbf{A}')\mathbf{z}$
  - Slide 4: in the bottom-most displayed equation  $\boldsymbol{\theta}$  has been corrected to  $\boldsymbol{\beta}$ . See my “meta-erratum” above.

- Slide 5: At the bottom of the slide I wrote that  $\log(0)$  equals  $\infty$ . This has been corrected to  $-\infty$ .
- Slide 7: Just under the heading “Assumption:” I wrote  $\beta_o$  and  $\beta$ . These have been changed to **boldface**:  $\beta_o$  and  $\beta$ .
- Slide 10: In the final displayed equation of the slide  $\exp(\mathbf{x}_i\boldsymbol{\beta})$  has been corrected to  $\exp(\mathbf{x}_i'\boldsymbol{\beta})$
- Slide 15: in the FOC at the bottom of the slide  $\{\mathbb{E}[y_i|\mathbf{x}_i] - \exp(\mathbf{x}_i'\boldsymbol{\beta})\} \boldsymbol{\beta}$  has been corrected to  $\{\mathbb{E}[y_i|\mathbf{x}_i] - \exp(\mathbf{x}_i'\boldsymbol{\beta})\} \mathbf{x}_i$ .
- Slide 16: in the FOC at the top of the slide  $\{\mathbb{E}[y_i|\mathbf{x}_i] - \exp(\mathbf{x}_i'\boldsymbol{\beta})\} \boldsymbol{\beta}$  has been corrected to  $\{\mathbb{E}[y_i|\mathbf{x}_i] - \exp(\mathbf{x}_i'\boldsymbol{\beta})\} \mathbf{x}_i$ .

**Version: 2020-01-26 at 22:50:29** All of these are “minor errors”

- Lecture 1

- Slide 8: “What parameter value  $\theta_0$ ” should be “What parameter value  $\theta_o$ ”
- Slide 11: the denominator of the definition of  $\mathbf{J}$  at the bottom of the slides contains a  $\partial^2$  that should be simply  $\partial$
- Slide 13:  $\mathbf{y}$  in the definitions of  $\mathbf{J}$  and  $\mathbf{K}$  should be  $\mathbf{y}_i$  to be consistent with the rest of the slide
- Slide 14: at the bottom of the slide  $\hat{\mathbf{J}}^{-1}\mathbf{K}\hat{\mathbf{J}}^{-1}$  should be  $\hat{\mathbf{J}}^{-1}\hat{\mathbf{K}}\hat{\mathbf{J}}^{-1}$ , i.e. the  $\mathbf{K}$  should have a “hat” over it
- Slide 16: the left hand side of the second to last displayed equation on the slide reads  $\mathbb{E} \left[ \frac{\partial \log f(\mathbf{y}|\boldsymbol{\theta}_o)}{\partial \boldsymbol{\theta}} \right]'$  but the  $'$  should be deleted
- Slide 21: At the bottom left of the slide  $y_n$  should be  $y_N$
- Slide 21: Two instances of  $y_n$  should be  $y_N$