

NEGATIVE BINOMIAL REGRESSION

2ND Printing , Cambridge University Press

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ERRATA AND COMMENTS

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The following errata/typos have been identified in the 2nd printing of Negative Binomial Regression. Please report to the author any additional errors found in the text. Send to either Hilbe@asu.edu or j.m.hilbe@gmail.com. I wish to thank Chris Dorger of Intel for identifying most of the errata below.

INTRODUCTION

- p 1: Last word of first sentence. The word “model” should be replaced by “distribution”.
- p 2: 12th line in top paragraph. “binomial” misspelled.

CHAPTER 3

- p 40: Eq 3.7 should read: $\mu = \exp(\eta)$
- p 40: Eq 3.8 left side of initial = sign should read: $b'(\theta)$
- p 42: line 3 of Table 3.1 should read: WHILE (abs(Δ dev) > tolerance) {
- p 42: Eq 3.20: delete minus sign in front of Σ

CHAPTER 4

- p 52: Line before Stata commands at bottom of page: Should be in regular font.
- p 56: last number at bottom right of page: Upper CI should read 1.015039
- p 64: Section 4.3.2: 1st line: Should read “Wedderburn”

CHAPTER 5

- p 80: Eqs 5.3 and 5.4: numerator of 2nd term should read v^y . Both are v (ν)
- p 82: Eq 5.25: last term before final = should read $-r/p$ ($-(1-p)$)
- p 83: Eqs 5.30 and 5.31: delete “exp” following Σ .
- P 83: Line directly under Eq 5.32 should read: “Substituting the log-likelihood function as specified in either Equation (5.30) or Equation (5.31), we have”
- p 83: Eq 5.33. Drop second α . 2nd term of deviance should be $-(y+1/\alpha)$ only.
- p 84: Eq 5.35. The formula should appear as: $g^{-1}(\theta) = \mu = 1/\{\alpha(e^{-\theta} - 1)\}$
- p 84: Equation 5.41. I have calculated a less complex formula, which reads as:
$$L = y(xb) + (1/\alpha) * \ln(1 - \exp(xb)) + \ln\Gamma(y+1/\alpha) - \ln\Gamma(y+1) - \ln\Gamma(1/\alpha)$$

Note that this new formula is in the revised version of the Stata **cnbreg** command.
It is posted to SSC; i.e., type at the Stata command line: `. ssc install cnbreg`
- p 90: Fig 5.11: Table, change
“po5” to “P:mean=10” ; Caption: change “...: mean = 5” to “...: mean = 10”
- p.96: 7th line of section 5.5, “...the gamma scale function...” should be “...the gamma scale parameter...”?

CHAPTER 6

- p.108: Table 6.6, title of 1st column is “years”, should be “naffairs”.
- p.113: beginning of 3rd line, should be “In any case, ...”
- p.117: Table 6.9, header of 5th column should read “Percent”
- p.119: 2nd paragraph, line 4, “ZINB” should be “ZTNB”
- p.125: Caption for Table 6.13, “Tabulation” is misspelled
- p.125: Table 6.13, 1st column should read, “MD visits”

p.127: beginning of 2nd paragraph, "Edu" should be "Educ".

CHAPTER 7

p.137: Table 7.1, line beginning "NB-P", exponent appears as "rho", but should be "p".

p.137: Eqs 7.1 and 7.2, 1st "exp" should be omitted

p.138: Eqs 7.3 and 7.4, 1st "exp" should be omitted

p.138: top line on page, change to read:

"Parameterized in terms of the log link function $\ln(\mu) = x_i\beta$ or $\ln(\mu) = x_i b$ [also $x\beta$ or xb], "

p.141: Eq 7.13, CUMULANT= $-\ln(p)$

p.141: Eq 7.17, "exp" should be omitted

p.145: 1st line after top table, equation to read: $\phi = (1+\alpha) = 1.503$.

p. 146: Eq 7.25, integrand is missing a $\lambda^{\mu-1}$ after 2nd term.

p. 146: Line under Eq 7.25: Should read: "Changing λ to μ and solving to clear the integration, we have"

p. 146: Eq 7.27, $\Gamma(\mu+1)$ in denominator should be $\Gamma(y+1)$

p. 146: Eq 7.28, $\Gamma(\mu+1)$ in denominator should be $\Gamma(y+1)$; drop $d\mu$

p. 147: 1st line after Eq 7.32, should read as "The variance to mean ratio is $(1+\delta)/\delta, \dots$ "

p. 155: 1st Eq on page should be changed to:

$$f(y;\mu,\alpha) = (\mu/(1+\alpha\mu))^y (1+\alpha y)^{y-1} / y! \exp[-\mu(1+\alpha y)/(1+\alpha \mu)]$$

CHAPTER 8

p.161: Eq 8.1, term over Σ should be n , not $i=1$

p.161: Eq 8.2, exponent is "-1/a", should be "-1/alpha"

CHAPTER 10

p. 216: Eq 10.18 should read $r_{ik} = \Sigma(y_{ik} - \mu_{ik}) / \text{sqrt}(V(\mu_{ik}))$

Next line should read:

"The Poisson Pearson residual is defined as $\Sigma(y_{ik} - \mu_{ik}) / \text{sqrt}(\mu_{ik})$ "

APPENDIX A

p. 233: Not an error, but an improvement. Amend LL function for NEGATIVE BINOMIAL

CANONICAL to $y(xb) + (1/\alpha) * \ln(1-\exp(xb)) + \ln\Gamma(y+1/\alpha) - \ln\Gamma(y+1) - \ln\Gamma(1/\alpha)$

p. 234 Not an error, but an addition: Add ZERO-TRUNCATED POISSON

$$y(xb) - \exp(xb) - \ln\Gamma(y+1) - \ln(1-\exp(-\exp(xb)))$$