

Corrections and additions to:

Matrix Algebra  
Econometric Exercises 1  
Cambridge University Press, 2005

by Karim M. Abadir and Jan R. Magnus

January 5, 2012

Below we have compiled a list of typos, errors, ambiguities, and additions, both as a service to our readers and as a reminder to ourselves to be included in possible reprints of the book.

Some of the items are very trivial, but still need to be attended to; others involve typos and errors.

We are always on the look-out for mistakes and we encourage our readers to report them to us. Please address your comments to Jan Magnus at [magnus@uvt.nl](mailto:magnus@uvt.nl).

We thank the following persons for communicating their findings to us:

Tirthankar Chakravarty  
Christoph Hanck  
J.P. Lewis  
Gideon Magnus  
Jan Stoop  
Hana Voňková

**Exercise 4.27 (page 86)**

The solution to (a) should read:

(a) The matrix  $|\mathbf{A}|$  is nonsingular because  $\text{rk}(\mathbf{A}) = \text{rk}(\mathbf{A}'\mathbf{A}) = \text{rk}(\mathbf{I}_n) = n$ .

**Exercise 5.40 (page 118)**

In the displayed formula in the exercise,  $|A|$  should be boldface:  $|\mathbf{A}|$ .

**Exercise 6.19 (page 141)**

Line 4 in the solution runs over the margin.

**Exercise 7.91 (page 206)**

Line 2 in the exercise: delete comma after displayed matrix  $\mathbf{A}$ .

**Exercise 8.10 (page 215)**

Line 1 in the solution runs over the margin.

**Exercise 8.23 (page 220)**

The solution is not as tight as it should be. The correct solution reads as follows.

***Solution***

Since  $\mathbf{A}$  is positive definite, Exercise 8.22 implies that  $\mathbf{A} = \mathbf{B}\mathbf{B}'$  where  $\mathbf{B}$  is square. Since  $\mathbf{A}$  has full rank, so has  $\mathbf{B}$  (Exercise 4.13(d)). By the QR decomposition (Exercise 7.35), we can write  $\mathbf{B}' = \mathbf{Q}\mathbf{L}'$ , where  $\mathbf{Q}$  is orthogonal and  $\mathbf{L}$  is lower triangular with positive diagonal elements. Hence,  $\mathbf{A} = \mathbf{B}\mathbf{B}' = \mathbf{L}\mathbf{Q}'\mathbf{Q}\mathbf{L}' = \mathbf{L}\mathbf{L}'$ .

**Exercise 8.69 (page 239)**

The last two lines of the solution should be replaced by:

Now premultiply both sides by  $\mathbf{V}^{-1/2}$  and postmultiply both sides by  $(\mathbf{X}'\mathbf{X})^{-1}$ . Upon transposing, we obtain the required equality. (Compare Exercise 12.29.)

## Chapter 9, Introduction (page 245)

Last line: “theeigenvalues” should be “the eigenvalues”.

### Exercise 9.11 (page 253)

Line 1 should read: “Let  $C$  and  $D$  be two real  $n \times n$  matrices, ...”

The reason for restricting  $C$  and  $D$  to be real (which is only needed for part (a)) is that the logarithmic function is multiple-valued, even in the case of a scalar complex variable. Taking logarithms on both sides of an equation, the equality may not hold anymore if the principal value is taken on both sides.

### Exercise 12.1 (pages 322–323)

In the solution to b), second line:  $(1/bb')bb'$  should read  $(1/b'b)bb'$ . Also, in the solution to c), third line from the end: “if and only” should read “if and only if”.

### Exercise 13.25 (page 366)

Line 5 from bottom: At the end of the formula giving  $D\mathbf{F}(\mathbf{X})$ , the differential  $d\text{vec } \mathbf{X}$  should be removed.

### Exercise 13.38 (page 373)

Last line: “ $d\text{vec}(\mathbf{Y}) = \mathbf{D}^+ d\text{vec } \mathbf{Y} = \dots$ ” should be: “ $d\text{vech}(\mathbf{Y}) = \mathbf{D}^+ d\text{vec } \mathbf{Y} = \dots$ ”.

### Exercise 13.53 (page 382)

Line 9: displayed formula should end with full stop (.).

### Exercise 13.56 (page 384)

Line 1: “Then, since  $\mathbf{R}'\boldsymbol{\beta} = \mathbf{c}$ , we find the solution for  $\mathbf{l}$  as” should be: “Then, denoting the constrained solution by  $(\tilde{\boldsymbol{\beta}}, \tilde{\mathbf{l}})$ , we have  $\mathbf{R}'\tilde{\boldsymbol{\beta}} = \mathbf{c}$ , and hence”

Line 4:  $\mathbf{X}\boldsymbol{\Omega}^{-1}\mathbf{X}$  should be  $\mathbf{X}'\boldsymbol{\Omega}^{-1}\mathbf{X}$ .

**Appendix A, Section A.3.4 (page 408)**

Line 17: the formula

$$f^{(n)}(c)(x - c)^n/n!$$

should read

$$f^{(n)}(c)(x - b)^n/n!$$