Errata

Dynamic General Equilibrium Modelling, 2nd Edition Springer: Berlin 2009

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Chapter 1.2

p. 14: item 2 should read: “2. The policy function h is increasing and differentiable.“

p. 22: the policy function proposed for the stock of capital should be:

$$K_{t+1} = k_0 K_t^{k_1}$$

Accordingly, the next to last line on this page should read:

“where the constants k_0 and k_1 are unique functions ...“

p. 23: the formula for the savings rate s is

$$s = \left[\beta a + \beta^2 (1-a)\delta^{1-\epsilon}\right]^{\frac{1}{\epsilon}}$$

p. 25: the condition for convergence is $1/\beta < 1$. Accordingly, the sentence in the middle of the page should read:

“If $1/\beta < A$, the stock of capital approaches ...“

Chapter 1.3

p. 28: The derivative of $\mathscr{L}$ with respect to K_1 should be:

$$\frac{\partial \mathscr{L}}{\partial K_1} = E_0\{-\lambda_0 + \omega_1 + \beta\lambda_1(1-\delta+Z_1 f'(K_1))\} = 0,$$

p. 30: The transversality condition in equation (1.25) should be:

$$\lim_{t\to\infty} \beta^t E_0 \lambda_t K_{t+1}.$$

Chapter 1.5

p. 46: at the top of the page, in the third equation $(1-\delta)$ instead of $(1+\delta)$.

Problem 1.2

The equation that determines the constant k_0 in question d) should be

$$k_0^{1/\delta}(1-\beta(1-\delta)) = \alpha\beta\delta.$$

Accordingly, the answer to question e) is trivial.

Appendix 2

p. 68: The growth factor of $F(X_t, 1)$, g_F must be smaller not greater than on. Thus:

$$g_F := \frac{F(X_{t+1}, 1)}{F(X_t, 1)} = \text{constant} < 1$$

p. 70: equation (A.2.3), the first line on the rhs of this equation should be

$$\frac{C^{1-\eta} v_1(1-N)}{1-\eta} + v_2(1-N) \text{ if } \eta \neq 1.$$

At the bottom of this page: the brace below the term $u_{11}(\cdot)/u_1(\cdot)C$ should not span the term dC/C, thus:

$$\underbrace{\frac{u_{21}(\cdot)}{u_2(\cdot)}C}_{\xi} \frac{dC}{C} = \underbrace{\frac{u_{11}(\cdot)}{u_1(\cdot)}C}_{-\eta} \frac{dC}{C} + \frac{dA}{A}$$

Chapter 2.4

p. 104: In equation (2.45) the definition of the coefficients h_K^C and h_Z^C includes the minus sign. Therefore, the braces should include the minus signs:

$$\bar{C}_t = \underbrace{-\frac{t^{21}}{t^{22}}}_{=:h_K^C} \bar{K}_t \underbrace{-\frac{q_2/\lambda_2}{t^{22}(1-(\varrho/\lambda_2))}}_{=:h_Z^C} \bar{Z}_t.$$

p. 105: In the formulas for the analytic solution the coefficients must be interchanged:

$$C_t = 0.732 Z_t K_t^{0.27},$$
$$K_{t+1} = 0.268 Z_t K_t^{0.27}$$

Chapter 2.5

p. 116: On the right-hand side of equation (2.67) a minus sign is missing. The equation should read:

$$\begin{bmatrix} g^1_{K'} + g^1_{C'} h_K^C & g^1_C + g^1_{C'} \left(h_K^K\right)^2 \\ g^2_{K'} + g^2_{C'} h_K^C & g^2_C + g^2_{C'} \left(h_K^K\right)^2 \end{bmatrix} \begin{bmatrix} h^K_{KK} \\ h^C_{KK} \end{bmatrix} = - \begin{bmatrix} \mathbf{h}_K^T H(g^1) \mathbf{h}_K \\ \mathbf{h}_K^T H(g^2) \mathbf{h}_K \end{bmatrix},$$

Problem 2.4

p. 171: Third paragraph, first line: $\vartheta = 0.5$ instead of $\psi = 0.5$. Furthermore, the last equation on this page should be:

$$Y_t = Z_t N_t^\alpha K_t^{1-\gamma} (K_t^G)^{1-\alpha-\gamma}.$$

Chapter 6.3

p. 321: equation (6.33) should be

$$R_{t+1} = \frac{\Pi_{t+1} - I_{t+1} + q_{t+1}K_{t+2}}{q_t K_{t+1}} = \frac{d_{t+1} + v_{t+1}}{v_t}.$$

Chapter 7.2

p. 343: on the right hand side of equation (7.16) the arguments of the function F_i must be interchanged, i.e., $F_i(\epsilon, a'^{-1}(\epsilon, a'))$.

Chapter 8.4

p. 426: Equation (8.33) and text below should read:

$$f'(a', s') = \sum_{s} \sum_{a=a'^{-1}(a',s)} \pi(s'|s) f(a, s), \tag{01}$$

where $a'^{-1}(a', s)$ denotes the inverse of the function $a'(a, s)$ with respect to its first argument a.

Chapter 9.2

p. 472: the last equation should be

$$K_t^{\alpha} N_t^{1-\alpha} = \sum_{s=1}^{6} \frac{c_t^s}{6} + K_{t+1} - (1-\delta)K_t$$

p. 476: The first-order condition (9.20b) should read:

$$\frac{1}{\beta} = \frac{(c_{t+s}^{s+1} + \psi)^{-\eta}(1 - n_{t+s}^{s+1})^{\gamma(1-\eta)}}{(c_{t+s-1}^{s} + \psi)^{-\eta}(1 - n_{t+s-1}^{s})^{\gamma(1-\eta)}}(1 + r_{t+s}), \quad s = 1, \ldots, 5.$$

In addition, the subsequent text should be replaced by:

Furthermore, we substitute consumption from the budget constraint, $c_{t+s-1}^s = (1-\tau_{t+s-1})w_{t+s-1}n_{t+s-1}^s + (1+r_{t+s-1})k_{t+s-1}^s - k_{t+s}^{s+1}$ for $s = 1, \ldots, 4$ or $c_{t+s-1}^s = b_{t+s-1} + (1+r_{t+s-1})k_{t+s-1}^s - k_{t+s}^{s+1}$ for $s = 5, 6$, and use $k_t^1 = k_t^7 = 0$ so that (9.20) is a system of 9 non-linear equations in the 9 unknowns $\{k_t^2, k_{t+1}^3, k_{t+2}^4, k_{t+3}^5, k_{t+4}^6, n_t^1, n_{t+1}^2, n_{t+2}^3, n_{t+3}^4\}$.

p. 478: the first equation should be:

$$K_t = \frac{1}{6}\sum_{s=1}^{6} k_t^s, \quad N_t = \frac{1}{6}\sum_{s=1}^{6} n_t^s.$$

p. 480: First paragraph, second line: 40×40 matrix instead of 20×20 matrix.

p. 485: Equation (9.23) should be:

$$Y_t = (A_t L_t)^{1-\alpha} K_t^{\alpha}.$$

Equation (9.25) should be:

$$\frac{\partial Y_t}{\partial L_t} = w_t = (1-\alpha) k_t^{\alpha} A_t.$$

p. 488: In the second equation on this page it should be ϕ_s instead of ϕ_t. Thus:

$$F_{t+1}(\tilde{\omega}', s+1, j) = \sum_{\tilde{\omega}' = \tilde{\omega}_t'(\tilde{\omega}, s, j)} \phi_s F_t(\tilde{\omega}, s, j), \quad s = 1, \ldots, 74,$$

Chapter 9.3

p. 483: equation (9.21) has a wrong index of the survival probability

$$\max \sum_{s=1}^{J} \beta^{s-1} \left(\Pi_{j=1}^{s} \phi_{j-1}\right) u(c_{t+s+1}(s), l_{t+s-1}(s))$$

Chapter 10.1

p. 513: in the line below equation (10.12) it should be $\sigma_\epsilon^2 = 0.045$ and not $\sigma_\epsilon = 0.045$.

p. 514: next to the last line, due to a bug in the program `Rch101.g`, which has been fixed in the most recent version, the Gini coefficient of labor income is not 0.413 but 0.399.

Chapter 10.2.1

p. 526: equation (10.25), the coefficient of $\hat{r}_t$ is not unity but $r/(r+\delta)$:

$$\frac{r}{r+\delta} \hat{r}_t = \hat{Z}_t - (1-\alpha) \sum_{s=2}^{60} \frac{k^s}{K} \frac{1}{60} \hat{k}_t^s + (1-\alpha) \sum_{s=1}^{40} \frac{n^s}{N} \frac{1}{60} \hat{n}_t^s.$$

Chapter 11.1

p. 555: next to last line, it should read $c = r(\cos\theta + i \sin\theta)$.

p. 560: Matrix multiplication is in general not commutative $AB \neq BA$, except in special cases. Thus, equation (11.8a), is not a rule.

p. 568: The equation before the last paragraph should read

$$L\tilde{\mathbf{x}} = \mathbf{b}$$

and not $L\tilde{\mathbf{x}} = \mathbf{x}$.

Chapter 11.2

p. 574: In the statement of the implicit function theorem it should read:

Then there exits an open ball B, centered at $\bar{\mathbf{x}} \in U_1$ and a continuous map $\mathbf{f} : B \subset U_1 \rightarrow U_2$ such that $\bar{\mathbf{y}} = \mathbf{f}(\bar{\mathbf{x}})$ and ...

p. 575: equation (11.38) should be:

$$J(\bar{\mathbf{x}}) := \mathbf{f}_x(\bar{\mathbf{x}}) = -D_y^{-1}(\bar{\mathbf{x}}, \bar{\mathbf{y}}) D_x(\bar{\mathbf{x}}, \bar{\mathbf{y}}),$$

p. 578: fifth line: is should be: $s''(x_0) = s''(x_n) = 0$

p. 580: In the definition of a family of orthogonal polynomials, the "if and only if" refers to the case $i \neq j$ only, i.e., there is no special requirement for the case $i = j$ (except in the definition of orthonormal polynomials).

p. 581: In equation (11.45), the second line left to the brace should read

$$\frac{\pi}{2} \text{ if } i = j \neq 0.$$

p. 582: To be consistent with equation (11.46), equation (11.50) should be

$$\hat{f}(z) = \frac{1}{2}\alpha_0 + \sum_{i=1}^{n} \alpha_i T_i(X(z)).$$

p. 584: In the definition of the discrete version of the orthogonality property of Chebyshev polynomials, the relation between the upper limit of summation in equation (11.56), m and the indices i and j is: $i, j < m$.

Chapter 11.3

p. 601: Equation (11.78) should be:

$$\begin{aligned}
&\int_{a_1}^{b_1} \cdots \int_{a_n}^{b_n} f(z_1, \ldots, z_n) dz_1 \ldots dz_n \\
\simeq &\frac{\pi^n (b_1 - a_1) \ldots (b_n - a_n)}{(2m)^n} \sum_{i_1=1}^{m} \cdots \sum_{i_n=1}^{m} f(Z(\bar{x}_{i_1}), \ldots, Z(\bar{x}_{i_n})) \\
&\times \sqrt{1 - \bar{x}_{i_1}^2} \ldots \sqrt{1 - \bar{x}_{i_n}^2}.
\end{aligned}$$

Chapter 11.5

p. 610: The right hand side of equation (11.88) should begin with x_s not x_{s+1}, i.e.,

$$x_{s+2} = x_s - \frac{x_{s+1} - x_s}{f(x_{s+1}) - f(x_s)} f(x_s).$$

p. 613: Second line: In the definition of the Lipschitz property, the statement should be: "for all $\mathbf{x}^1, \mathbf{x}^2 \in \mathcal{N}(\mathbf{x}^s)$".

p. 615: In equation (11.93) the plus sign is missing, i.e., the equation should read:

$$A^{s+1} = A^s + \frac{[\mathbf{y}^{s+1} - A^s \mathbf{w}^{s+1}] (\mathbf{w}^{s+1})^T}{(\mathbf{w}^{s+1})^T (\mathbf{w}^{s+1})}.$$

Chapter 12.1

p. 649: line 9 from the top, the approximation is:

$$\mathbf{f}(\mathbf{x}^* + \mathbf{h}) \simeq \mathbf{f}(\mathbf{x}^*) + J(\mathbf{x}^*)\mathbf{h}, \; \mathbf{h} = \mathbf{x} - \mathbf{x}^*,$$

Chapter 12.4

p. 663: equation (12.17):

$$\min_{(g_t)_{t=1}^T} \sum_{t=1}^{T} (y_t - g_t)^2 + \lambda \sum_{t=2}^{T-1} [(g_{t+1} - g_t) - (g_t - g_{t-1})]^2.$$

p. 664: the entry in the second row and fourth column of the matrix K should be 1 and not zero.

References

p. 683: In Section 11.3.2 we cite Stroud (1971). However, this book does not appear in the References. This missing entry is:

Strout, A.H. 1971. Approximate Calculation of Multiple Integrals. Englewood Cliffs, NJ. Prentice-Hall.