CORRECTION OF TYPOS IN
"INTRODUCING ADVANCED MACROECONOMICS: GROWTH AND BUSINESS CYCLES"

CORRECTIONS RELEVANT ALSO FOR THE SECOND PRINT

Very important corrections are indicated by: (!!!)

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Preface

Page xix, line 17: Replace "Henrick" by "Henrik"

Book One

Chapter 3

Page 62, line 7: Replace "Nevertheless, an optimal combination ..." by "Nevertheless, a combination ..." (change "an" into "a" and drop "optimal").

Page 84, in Table 3.1: In the heading of third column, replace "t_t" by "y_t" (**!!!**)

Page 88, in Exercise 1:

In first line replace "$Y = BK^a L^{1-\alpha}$" by "$Y = BK^\alpha L^{1-\alpha}$" (replace one a by α) (**!!!**)

In line 12, the formula, replace "$0 < \alpha < 0$" by "$0 < \alpha < 1$" (**!!!**)

Page 90, in Exercise 4: Between line 6 and 7, insert some additional vertical space.

Page 94, in Exercise 11:

line 5 from below: Replace "... $k_t$the function..." by "k_t, the function...".

last character of line 5 from below and first characters of line 4 from below: y_t must be in one line and horizontal space is missing after it.

Chapter 4

Page 111, line 4 from below, in the subsection head: Replace "... and income ..." by "... and the income ..." (that is, insert "the" between "and" and "income").

Page 122, line 3: Replace "$\nabla 1-\alpha$" by "$1-\alpha$" (drop the "∇" appearing as first character) (**!!!**)

Page 126, in Exercise 8, at several places a wrong font has been used for v:

In the formula of line 2 for v_t, in the formula of line 6 for v_{t+1} and v_t, and in line 14 for v^* as well as for v_t.

Chapter 5

Page 131, line 8 from below: Insert a "," (comma) in front of "respectively".

Page 135, in Figure 5.2:

In the upper diagram, the label on the horizontal axis should be $\tilde{k}_t$, that is, replace "k_t" by "$\tilde{k}_t$" (**!!!**)

In the upper as well as the lower diagram, the curve should start being very steep (the way the curves and lines look, but not the labels, can be taken over from Figure 3.5).

Page 156, between line 11 and 12 from below (after "3", before "The *alternative* ..."): Insert vertical space.

Chapter 6

Page 168, in the heading of subsection: Replace "statics" by "analysis" (**!!!**)

Page 169, line 8: Delete "static" (**!!!**)

Page 169, line 17: In "y_t^*" the subscript "t" should be placed below the superscript "$*$" (move t to the left).

Page 172, line 23 - 24: Delete the entire paranthesis "(Compute ... α and φ.)" (**!!!**)

Page 174, in Figure 6.5: In label on horizontal axis, replace "... $[\ln s_H \ln (n + 0.075)]$" by "... $[\ln s_H - \ln (n + 0.075)]$", that is, insert a "$-$" in the second square bracket. (**!!!**)

Page 188, in Ecercise 7, line 2 - 3: Replace the full sentence "Find ... and comment." by "Comment." (**!!!**)

Chapter 7

Page 195, the subsection "Convergence to steady state":

Replace the entire first paragraph of lines 1 - 6, "You may have ... in terms of z_t" by:

"The Solow model with land can conveniently be analysed directly in terms of the capital-output ratio, $z_t \equiv K_t/Y_t = k_t/y_t$, for which we want to establish convergence to a constant steady state level. We could have chosen to analyse the Solow model of Chapter 5 in z_t as well, as you were in fact asked to do in an exercise. It is often a matter of

choice, whether the dynamic system associated with a growth model should be expressed in variables such as capital per effective worker or in the capital-output ratio. This way you will come to see examples of both."

(This paraghraph has to be rewritten. We have tried to give the new one the same length as the old one). **(!!!)**

Page 212, line 12: In the formula "$z^* = ...$" drop parenthesis around "$\beta + \kappa$", that is, write:

$$z^* = \frac{s}{\frac{\beta}{\beta + \kappa}(n + g) + \delta}$$

Page 214, line 3 from below: Replace "$... = \beta + \kappa + \varepsilon.)$" by "$... = \beta + \kappa + \varepsilon).$"

Chapter 8

Page 225, line 9: In formula (14) the "$(\alpha + \phi - \alpha\phi)/(1 - \phi)$" coming just after the first "$\tilde{k}_t$" should be an exponent on this "$\tilde{k}_t$", that is, the formula should read:

$$\tilde{k}_{t+1} = \frac{1}{1 + n} \left(s\tilde{k}_t^{(\alpha + \phi - \alpha\phi)/(1 - \phi)} + (1 - \delta)\tilde{k}_t^{1/(1 - \phi)} \right)^{1 - \phi}.$$

(!!!)

Page 227, line 4: Replace "$g_{se}^A \cong \phi/(1 - \phi)n$" by "$g_{se}^A \cong \phi n/(1 - \phi)$" **(!!!)**

Page 236, line 1 from below: Replace "... between the (constant) growth rate of GDP ..." by "... between the long run growth rate of GDP ..." (drop "(constant)" and insert instead "long run")

Page 242, in Exercise 2:

   Question 1, line 3: Replace ".)" by ")."

   Question 2, line 3, in the formula replace "$(1-\delta)$" by "$1-\delta$", that is, drop paranthesis around $1 - \delta$ in numerator.

Page 245, line 17: In the exponent on the "H_t" replace "$\varphi'(\alpha + \varphi)$" by "$\varphi/(\alpha + \varphi)$" **(!!!)**. Furthermore, the formula is not written in the fonts otherwise used for exercises.

Page 246, lines 6 and 7 from below: In this formula over two lines, on the left hand side in the first line "$\tilde{k}_t$" should be replaced by "$\tilde{k}_{t+1}$" and in the second line the exponent on the first "$\tilde{k}_t$" should be "$\alpha/(1 - \phi)$", that is, "$s\tilde{k}_t^{[\alpha - \phi(1 - \alpha)]/(1 - \phi)}$" should be replaced by "$s\tilde{k}_t^{\alpha/(1 - \phi)}$" **(!!!)**

Page 250, line 13: Replace "Inputs: The ..." by "Inputs: the ..."

Chapter 9

Page 264, Figure 9.5: In the figure legend replace "... labour-augmenting progress..." by "... labour-augmenting technological progress..." (that is, insert "technological") **(!!!)**

Page 266, line17, the formula at the end of this line, "$g_{se} = (1+n)^{\lambda/(1-\phi)}$", must be replaced by "$g_{se} = (1+n)^{\lambda/(1-\phi)} - 1$" (minus one should be added). **(!!!)**

Page 267, in the paragraph "Now turn ... return to g_{se}":

line 8 (of this paragraph): replace "A_{10}^{ϕ}" (standing in the formula after the second "=") by "$A_{10}^{\phi-1}$" (add minus one in exponent),

line 9: replace "A_9^{ϕ}" (standing in the first formula) by "$A_9^{\phi-1}$" and replace "$(A_{10}/A_9)^{\phi}$" (standing in the second formula) by "$(A_{10}/A_9)^{\phi-1}$" (at two places add minus one in exponent),

line 10: at two places replace "(s_R'/s_R)" by "$(s_R'/s_R)^{\lambda}$" (add exponent λ) and replace "$(1+g_9)^{\phi}$" by "$(1+g_9)^{\phi-1}$" (add minus one in exponent),

line 11: replace "$(1+g_9)^{\phi}$" by "$(1+g_9)^{\phi-1}$" (add minus one in exponent) and replace "(s_R'/s_R)" by "$(s_R'/s_R)^{\lambda}$" (add exponent λ),

line 12: replace "(s_R'/s_R)" by "$(s_R'/s_R)^{\lambda}$" (add exponent λ).

(!!!)

Page 272, the formula in line 4 of Question 2 in Exercise 1: Replace the "$\dot{k}$" on the left hand side by "$\dot{\tilde{k}}$" (the k must have a $\tilde{}$ above it and on top of that a $\cdot$) **(!!!)**

Page 272, the Hint in line 5 of Question 2 in Exercise 1: Replace "... use the log-difference trick on the formula for g_A.)" by "... take logs on both sides and then differentiate with respect to time in the above formula for g_A)." **(!!!)**

Page 272, line 5 and 6 of Question 2 in Exercise 1: After the parenthesis containing the hint there should be new line plus some vertical space (that is, the "Assume first that $\phi < 1$ and $n > 0$." should appear just as the remark "Now consider ... by $\bar{L}$." coming between Question 4 and 5.

Page 274, Exercise 6, Question 3. This question is erroneous, and the entire text should be replaced by:

"**3.** Compute the range that the annual rate of convergence, $1 - G'(g_{se})$, will be in for values of λ between $1/2$ and 1, values of ϕ between $1/4$ and $3/4$, and values of n between 0.5% and 1% per year. Comment on the order of magnitude of $1 - G'(g_{se})$ for these

non-extreme parameter values, e.g., by comparing to the rate of convergence we typically find for output per effective worker in the Solow model. Figure 9.7 in this chapter shows a relatively slow convergence of g_t for the particular parameter values $\lambda = 1$, $\phi = 1/2$, and $n = 0.005$. Does this relatively slow convergence seem to be robust for parameters in the non-extreme region considered here?"

(This is shorter than the old Question 3. It should, however, be possible to move the text on page 275, the last page of the chapter, appropriately upwards, e.g., to let Exercise 7 start at the top of page 275).

(!!!)

Page 275, line 5 of Question 2 in Exercise 7: Replace "... in period 0.)" by "... in period zero)."

Chapter 10
Page 291, line 4 from below, the two last characters: Replace ".)" by ")."

Chapter 11
Page 315, line 12: Replace "... their ..." by "... the person's ..."

Page 322, line 4: Replace "... $\bar{x} = \frac{1}{T}\sum_{t=1}^{T} x$ is:" by "... $\bar{x} = \frac{1}{T}\sum_{t=1}^{T} x_t$ is:" (that is, add subscript t on the last x) (!!!)

Chapter 12
Page 357, in the figure: Replace "$(1-e)^m (w-b)^m$" by "$(1-e)^\eta (w-b)^\eta$" (at two places write η instead of m). (!!!)

Page 358, in Figure 12.6: The straight line (or ray) through the origin should not be there, please remove it. (!!!)

Page 358, line 5: Replace "... $e^* < 1 - n$ ..." by "... $e^* < 1 - \eta$ ..." (that is, replace n by η) (!!!)

Page 358, line 6: Replace "$u^*(= 1 - e^*) > n$." by "$u^* (= 1 - e^*) > \eta$." (that is, insert horizontal space between "u^*" and "(", and replace n by η) (!!!)

Page 359, lines 14-15: At two places replace "n" by "η" (!!!)

Chapter 13
Page 373, line 9 from below, first word in the line: Replace "members" by "member" (a representative member is one person)

Page 379, line 4: Replace "Section 1" by "Section 2"

Page 379, formula (13): Replace "... $\frac{1}{1-1/\sigma u}b$" by "... $\frac{1}{1-1/(\sigma u)}b$" **(!!!)**

Page 383, line 4 from below: Replace "members" by "member"

Page 385 - 386, Exercise 2, Question 1, line 5 and Question 3, line 2: A wrong font has been used for v.

Page 388, line 5 from below: Replace "$(m^p)^2(b-a)(1-\tau) < 1$" by "$(m^p)^2(b-a)/(1-\tau) < 1$" (insert a "/" between "$(b-a)$" and "$(1-\tau)$") **(!!!)**

Page 389, line 3: Replace "$tw^* - a$" by "$\tau w^* - a$" (change t into τ) **(!!!)**

Page 389, line 10: Replace ".)" by ")."

Book Two

Chapter 14

Page 404, let Formula (3) be simply:

$$HP = \sum_{t=1}^{T} (y_t - g_t)^2 + \lambda \sum_{t=2}^{T-1} \left[(g_{t+1} - g_t) - (g_t - g_{t-1})\right]^2$$

that is, drop the "$\overbrace{}^{c_t}$" and the "$\overbrace{}^{\text{change ... } t+1}$" and put the content of the square bracket on line.

Chapter 15

Page 450, line 2 below the figure: Replace "$D_t^e/K_t = \theta g\left(Y_t/K_t, E_t\right)$" by "$D_t^e/K_t = g\left(Y_t/K_t, E_t\right)$", that is, drop "$\theta$" in this formula. **(!!!)**

Page 461, line 1: The very last "B" should be "B_2". **(!!!)**

Chapter 16

Page 477, Figure 16.7: in the diagram, replace "$0 < \sigma < 1$" by "$0 < \sigma < \infty$" **(!!!)**

Chapter 17

Page 501, last definition in equation (12): Replace "$v \equiv \widetilde{m}\left(\frac{\varepsilon}{D_\varepsilon}\overline{Y}\right)(\ln \varepsilon - \ln \varepsilon)$" by "$v \equiv \widetilde{m}\left(\frac{\overline{\varepsilon}}{D_\varepsilon}\overline{Y}\right)(\ln \varepsilon - \ln \overline{\varepsilon})$" (put a bar over two of the three ε's) **(!!!)**

Page 502, last two definitions in equation (14): Replace "$\frac{\partial l}{\partial Y}$" by "$\frac{\partial L}{\partial Y}$"; replace "$\frac{\partial l}{\partial i}$" by "$\frac{\partial L}{\partial i}$" **(!!!)**

Chapter 18

Page 536, 13th line from above: Replace "..more strongly.." by "less" (that is, write "...employment fluctuates less in the competitive market....") **(!!!)**

Page 548, Exercise 2, question 2, first line: Replace "higher" by "lower" (that is, write "...labour demand is lower at the sectoral level ....") **(!!!)**

Page 550, 5th line from bottom of page: Replace "$\pi^e \equiv p^e - p^e_{-1}$" by "$\pi^e \equiv p^e - p_{-1}$" (that is, replace "$p^e_{-1}$" by "$p_{-1}$") **(!!!)**

Chapter 19

Page 560, first formula in equation (6): Replace "$(\pi_t - \pi^*)$" by "$(\pi^* - \pi_t)$" **(!!!)**

Page 587, Table 19.3, headline of third column: This headline should read: "Standard deviation of hours worked relative to standard deviation of output" **(!!!)**

Page 594,

in Formula (63): Replace "... $(g - \bar{g})$ ..." by "... $(g_t - \bar{g})$ ..." (put subscript t on g), **(!!!)**

in Formula (66): Replace "... y_{t-1} ..." by "... $\hat{y}_{t-1}$ ..." (put a hat on y_{t-1}) **(!!!)**

Chapter 20

Page 612 (both of the following corrections are very important):

equation (11): Replace this equation by

$$\sigma_y^2 = \frac{2\gamma\left(1 + \alpha\gamma\right)^{-1}\sigma_z^2 + \alpha\sigma_s^2}{\gamma\left(2 + \alpha\gamma\right)}, \tag{11}$$

equation (14): Replace this equation by

$$\sigma_y^2 = \frac{2\sigma_z^2}{\left(1 + \alpha\gamma\right)\left(2 + \alpha\gamma\right)} = \frac{2\sigma_v^2}{\left(1 + \alpha_2 b + \alpha_2\gamma h\right)\left[2\left(1 + \alpha_2 b\right) + \alpha_2\gamma h\right]}, \tag{14}$$

Page 623 (*all* of the corrections on p. 623 are very important):

Equations (25a) and (25b) should be *deleted* and should be replaced by the following single equation:

$$
\begin{aligned}
\widehat{y}_t \;=\; & \beta z_t - \beta\left(1 - \beta\right)z_{t-1} - \beta^2\left(1 - \beta\right)z_{t-2} - \beta^3\left(1 - \beta\right)z_{t-3} - \cdots \\
& -\alpha\beta s_t - \alpha\beta^2 s_{t-1} - \alpha\beta^3 s_{t-2} - \alpha\beta^4 s_{t-3} - \cdots
\end{aligned} \tag{25}
$$

in first line below equation (28): Replace "(25a)" by "(25)"

in third line below equation (28): Replace "(25a)" by "(25)"

in line right above equation (29): *Delete* the words "From (25b)-(27) it then follows that:"

equation (29): *Delete* this equation

the two lines above equation (30): *Delete* these two lines

equation (30): *Delete* this equation

in line right above equation (29), after the words "..have identical variance σ_s^2.", insert the following text and subsequent equation: "Using (26) through (28) and denoting the asymptotic variance of $\widehat{y}$ by σ_y^2, we may therefore write the variance of the sum on the right-hand side of (25) as:

$$\sigma_y^2 = \beta^2 \sigma_z^2 + \left[(1-\beta)^2 \sigma_z^2 + \alpha^2 \sigma_s^2\right] \left(\beta^2 + \beta^4 + \beta^6 + \cdots\right) \tag{29}$$

Page 624, (*all* of the corrections on p. 624 are very important):

in first line, Replace "(30)" by "(29)"

second line (the unmumbered equation): this equation should be numbered as "(30)"

in third line (right below the equation), write "so from (29) and (30) we get" (that is, insert "..(29) and ")

equation (31): This equation should be corrected to:

$$\sigma_y^2 = \frac{\beta^2 \left[2\left(1-\beta\right)\sigma_z^2 + \alpha^2 \sigma_s^2\right]}{1-\beta^2}. \tag{31}$$

Page 625

first line in Question 1 (8th line from the top): Replace "(41)-(44)" by "(36)-(38)", that is, write "...in the model (36)-(38) and..." **(!!!)**

first and second line in Question 3: Replace "(45) and (46)" by "(39) and (40)" **(!!!)**

first line in Question 4: Replace "(47) and (48)" by "(41) and (42)" **(!!!)**

Page 626, fourth line in Question 1 (seventh line from the bottom): Replace "(52)" by "(46)" **(!!!)**

Chapter 21

Page 634,

line right above equation (23): Delete the words "assuming that $h \neq 0$" **(!!!)**

line right above equation (24): The last part of this line should read "..the solution for the expected inflation rate (assuming that $h \neq 0$):" **(!!!)**

Page 658,

seventh line in Question 2 (line right above equation (82)): Replace "(78)" by "(81)" **(!!!)**

equation (82): Replace "$\alpha_1 c_\pi (\pi_t - \pi^*)$" by "$\alpha_1 c_\pi (\pi^* - \pi_t)$" **(!!!)**

second line in Question 3: Replace "(80) and (81)" by "(81) and (82)" **(!!!)**

Page 660,

equation (96): Replace "$1+r$" by "$(1+r)^2$" in the denominator in the second formula in (96) (the formula for $Q_{t+2,t}$) **(!!!)**

equation (97): Replace "$1 + r$" by "$(1+r)^n$" in the denominator in this formula

equation (98): Replace "$Q_t = \frac{\overline{h} - \tau_t}{1+r} + \frac{\overline{h} - \tau_{t+1,t}^e}{1+r} + \frac{\overline{h} - \tau_{t+2,t}^e}{1+r} + ...$"

by "$Q_t = \frac{\overline{h} - \tau_t}{1+r} + \frac{\overline{h} - \tau_{t+1,t}^e}{(1+r)^2} + \frac{\overline{h} - \tau_{t+2,t}^e}{(1+r)^3} + ..$" (notice the corrections in the denominators) **(!!!)**

Chapter 22

Page 679, footnote 9: The last sentence: "In Exercise 4 you are invited to demonstrate that even if $\overline{r}$ is mismeasured, we still obtain the expressions for the optimal values of b and h given in Eqs (43) and (44) below." should be *deleted* and *replaced* by the following sentence: "In Exercise 4 you are invited to analyze the case where $\overline{r}$ is mismeasured." **(!!!)**

Page 690, equation (64): Replace y with y_t (add the subscript t).

Page 693, Question 2 of Exercise 4: The entire text of Question 2 ("Use the procedure...etc.") should be *deleted* and *replaced* by the following:

"**2.** Use the procedure described in Section 3 to show that the optimal values of b and h are given by the expressions

$$b = \frac{\sigma_z^2 + \alpha_2^2 \sigma_a^2}{\alpha_2 \sigma_\mu^2}$$

$$h = \frac{\gamma (\sigma_z^2 + \alpha_2^2 \sigma_a^2)}{\alpha_2 \sigma_\epsilon^2}$$

Compare these expressions to those given in Eqs. (43) and (44) in the text and give an intuitive explanation for the differences." **(!!!)**

Chapter 23

Page 710, equation (23): Replace "$(\ln \varepsilon - \ln \epsilon)$" by "$(\ln \varepsilon - \ln \overline{\varepsilon})$" **(!!!)**

Page 711, equation (27): Replace "$(\ln\varepsilon - \ln\epsilon)$" by "$(\ln\varepsilon - \ln\bar{\varepsilon})$" **(!!!)**

Page 715, equation (34): Replace "$(1 - \gamma u)$" by "$(1 - \mu - \gamma u)$" **(!!!)**

Page 716,

line right above equation (37): Replace "$\ln(1 - \gamma u) \approx -\gamma u$" by "$\ln(1 - \mu - \gamma u) \approx -\mu - \gamma u$" **(!!!)**

equation (37): Replace the first two lines in (37) by the following:

$$\overbrace{\frac{a}{M^p}}^{W} \cdot P = M^w \left(1 - \mu - \gamma u\right) \overbrace{\frac{\bar{a}}{M^p}}^{W^e} \cdot P^e \qquad \Longrightarrow$$

$$p \approx p^e + m^w - \mu - \gamma u + \ln\bar{a} - \ln a \qquad (37)$$

(!!!)

equation (38): Replace the last definition "$\bar{u} \equiv m^w/\gamma$" by "$\bar{u} \equiv \frac{m^w - \mu}{\gamma}$" **(!!!)**

Chapter 24

Page 758: The numbering of the "Summary" section should be changed from "20.5" to "24.5"

Page 762, Question 4 of Exercise 5: Replace the bracket "(a higher value of λ)" by "(a lower value of λ)" **(!!!)**

Chapter 25

Page 772, first formula in equation (10): Replace "v" by "$\bar{v}$" **(!!!)**

Page 777, the line right below equation (19): Replace "e" by "e^r" **(!!!)**

Page 778,

fourth line in second paragraph: Replace "$\left(\beta_1/\widehat{\beta}_1\right)\left(\pi^f - \pi_1\right)$" by "$\left[\beta_1\left(1 + h\theta^{-1}\right)/\widehat{\beta}_1\right]\left(\pi^f - \pi_1\right)$" **(!!!)**

ninth line in second paragraph: Replace "$\left(\beta_1/\widehat{\beta}_1\right)\left(\pi^f - \pi_2\right)$" by "$\left[\beta_1\left(1 + h\theta^{-1}\right)/\widehat{\beta}_1\right]\left(\pi^f - \pi_2\right)$" **(!!!)**

Page 792, equation (49): Replace the terms "$-\beta_1\Delta\bar{e} - \beta_1\theta^{-1}\Delta r^f$" by "$\beta_1\Delta\bar{e} + \beta_1\theta^{-1}\Delta r^f$" **(!!!)**

Appendix

Page 827, formula (14): Move the "etc." at the end of (14) to the beginning of the line just after (14).