Corrections to: Bayesian Econometrics by Gary Koop (published by Wiley)

I would like to thank John Bagnall, Luc Bauwens, Dries Benoit, Vincent Castel, Joshua Chan, Matteo Ciccarelli, Leslie Djuranovik, Bill Griffiths, Mike Kim, Bo Laurson, Jack Li, James MacKinnon, Jan Magnus, Zhenming Su, Peter Summers, Dick Startz, Umed Temurshoev and Fuyu Yang for pointing out these errors.

- Page 1, the second equation on this page should be:

$$p(A, B) = p(B|A)p(A).$$

- Page 5, 8 lines after (1.8), the probability here should be $p(y^*|y)$
- Page 20, (2.18) should be

$$var(h|y) = \frac{2\overline{s}^{-4}}{\overline{\nu}}.$$

  This error was also made in the Matlab code used in the empirical example on pages 28-30 so results here will be (very slightly) off

- Page 23 and page 269, Jeffreys prior should be

$$p(\beta, h) = \frac{1}{\sqrt{h}},$$

- Page 36, (3.7), the $h^{\frac{1}{2}}$ term in the likelihood function should be $h^{\frac{k}{2}}$
- Page 37, (3.19) should be

$$var(h|y) = \frac{2\overline{s}^{-4}}{\overline{\nu}}.$$

- Page 38, (3.24) should be

$$p(\beta, h) \propto h^{\frac{k-2}{2}}$$

- Page 42, (3.37) should be:

$$PO_{12} = \frac{\left(|X_1'X_1|\right)^{-\frac{1}{2}}\left(\nu_1 s_1^2\right)^{-\frac{N}{2}} p(M_1)}{\left(|X_2'X_2|\right)^{-\frac{1}{2}}\left(\nu_2 s_2^2\right)^{-\frac{N}{2}} p(M_2)}.$$

- Page 45: to be consistent with previous notations, in the first line after (3.38) write $N\left(0_T, h^{-1}I_T\right)$

- Page 45: In (3.39) change S to T.
- Page 46, line 1: Change (3.38) to (3.39).
- Page 51, Table 3.2: The estimates of standard deviations of the prior and posterior h are slightly off. This is because MATLAB file ch3post.m in line 58 should have hvar=2/(v1*s12^2) and not hvar=2/v1s12.
- Page 60, 2 lines above (4.3), should refer to "(3.3), (4.1) and (4.2)"
- Page 66, last line: "posterior involves is a mixture" should read "posterior involves a mixture".
- Page 66, equation 4.14 should be

$$CD = \frac{\widehat{g}_{S_A} - \widehat{g}_{S_C}}{\sqrt{\frac{\widehat{\sigma}_A^2}{S_A} + \frac{\widehat{\sigma}_C^2}{S_C}}}. \tag{4.14}$$

- Page 79, 2 lines above (4.39), the reference to (4.38) should refer to (4.37)
- Page 84, line 4 from the top: "weights are then calculated as specified in (4.38)."
- Page 84, line 8 from the top: "as in (4.37), we can calculate..."
- Page 103, line 18 from the top: "we are setting $g(y) = Skew(y)$ or $Kurt(y)$ and$g(y^\dagger) = Skew(y^\dagger)$ or $Kurt(y^\dagger)$." The expectation symbols need to be deleted.
- Page 103, has a description of the posterior predictive p-value. It is correct as stands, but could be a bit misleading (the method described calculates the probability of more extreme values than the observed test statistic *in one tail only of the its posterior distribution*). The way I have defined it, the posterior predictive p-value is a number between 0 and 0.5. You can get a more conventional p-value by doubling this (which should work well if the distribution is roughly symmetric).
- Page 106, equation (5.22) should be

$$f(\theta) = \frac{1}{(1-p)(2\pi)^{\frac{k}{2}}} |\widehat{\Sigma}|^{-\frac{1}{2}} \exp\left[-\frac{1}{2}\left(\widehat{\theta}-\theta\right)' \widehat{\Sigma}^{-1}\left(\widehat{\theta}-\theta\right)\right] 1\left(\theta \in \widehat{\Theta}\right),$$

- Page 107, line 3: "for the noninformative prior given in (5.4), and ..."
- Page 107, line 4 in the second paragraph from bottom should refer to (5.6).
- Page 120, equation (6.8) is missing a $|\Omega|^{-\frac{1}{2}}$ and the $h^{\frac{1}{2}}$ should be $h^{\frac{k}{2}}$.

- Page 129 says "... linear regression model with independent student-t errors". Formally, this holds for a fixed ν_λ. When we treat ν_λ as an unknown parameter and give it a hierarchical prior the results is a mixture of Student-t's.

- Page 153, the equation near the bottom of page should be

$$\overline{\beta} = \overline{V}_\beta \left(\underline{V}_\beta^{-1} \underline{\beta} + h \sum_{i=1}^{N} \widetilde{X}_i' \left[y_i - \alpha_i \iota_T \right] \right),$$

- Page 160, (7.36) should be:

$$\widehat{p\left(\theta_2^* | y, \theta_1^*\right)} = \frac{1}{S^*} \sum_{s^*=1}^{S^*} p\left(\theta_2^* | y, z^{(s^*)}, \theta_1^{*}\right),$$

- Page 183, third line from bottom should have $E\left(\alpha_t | \alpha_{t-1}\right) = \alpha_{t-1}$

- Page 184, line 5 the u_t should be ε_t.

- Page 190, the reference to (8.10) 15 lines from the bottom of the page should be (8.19)

- Page 198, there is an error in the material on this page describing the link between the general state space formulation of (8.38) and (8.39) taken from DeJong and Shephard (1995) and the conditional posterior described on the previous page (page 197). One way of correcting this error would be to alter the two unnumbered equations on the middle of page 198 as

$$J_t = \left(0_p \ \sqrt{h} A \right)$$

and

$$A' A = H^{-1}$$

This error is also in the code used to produce the example on pages 200-202.

- Page 198, (8.42) should be

$$K_t = \left(T_t P_t Z_t' + J_t G_t' \right) D_t^{-1},$$

- Page 199, (8.44) should be

$$P_{t+1} = T_t P_t \left(T_t - K_t Z_t \right)' + J_t \left(J_t - K_t G_t \right)'$$

- Page 199, (8.47) should be

$$V_t = F_t \left(G_t' D_t^{-1} Z_t + \left[J_t - K_t G_t \right]' U_t \left[T_t - K_t Z_t \right] \right),$$

- Page 202, there was a small error in the Matlab code to make up this empirical example (see below). As a result Table 8.1 and Figure 8.3 are wrong.
- Page 242, equation for $p(\eta|y)$ at the bottom of the page is incorrect. The general form of this equation is given in (8.21) on page 189 and you can just just this form for the equation.
- Page 268, nine lines from bottom $(y_1, .., y_T)'$ should be $(y_1, .., y_N)'$
- Page 271, the degrees of freedom below (11.9) should be N-1, not N
- Page 271, in (11.12) the ι_Ts should be ι_Ns
- Page 271, between (11.11) and (11.12), the formula for P_{X_r} is incorrect. It should be:

$$P_{X_r} = M_1 - X_r \left(X_r' X_r\right)^{-1} X_r',$$

where

$$M_1 = I_N - \frac{\iota_N \iota_N'}{N}$$

- Page 290: The information matrix is based on the log of the likelihood function, not the likelihood function itself. There are two equations on this page which should have log likelihoods instead of likelihoods in them.
- Page 320, Theorem B.2, should be:

Let X and Y by two random variables, $g()$ and $h()$ be two functions and a and b be constants, then

- $E[ag(X) + bh(Y)] = aE[g(X)] + bE[h(Y)]$ and
- $var[ag(X) + bh(Y)] = a^2 var[g(X)] + b^2 var[h(Y)]$ if X and Y are independent.
- Page 322, Definitions B.13 and B.14 are repeats of the definitions on page 321.
- Page 327: In the p.d.f. of the multivariate Normal distribution write $(2\pi)^{\frac{k}{2}}$ instead of $2\pi^{\frac{k}{2}}$.
- Page 329: The Wishart is only defined for $\nu \geq N$.
- Page 339, the Hobert and Casella reference is in volume 91 (not 96 as listed in the book).
- Page 344, the correct reference should be:

Zellner, A. and Tobias, J. (2001). "Further Results on Bayesian Method of Moments Analysis of the Multiple Regression Model," *International Economic Review*, 42, 121-139.

Errors in the Computer Code on the Book's Website

In chapter8c.m there was an error (the lamba's are not fed through into the djs.m algorithm properly). I have fixed this up, but it means that the empirical results on page 202 are based on the wrong code and are incorrect.

In chapter7d.m, there is two small errors in the method of Chib marginal likelihood calculation (in lines 67 and 148, the log determinants of the prior and posterior covariance is multiplied by kx, which it should not be. I have fixed this up, but as of January 2009, I have not updated the website version).

In chapter7c.m a reader says there is an error in the drawing of the slope coefficients.

In chapter 7d.m there is a minor error in step defining sigterm1 (in two places). See equation 6.54 for correct formulation.