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LAMPIRAN

Lampiran 1. Pembuktian $\boldsymbol{E}(\boldsymbol{Res}(X|C)|C) = 0$

$$\boldsymbol{E}(\boldsymbol{Res}(X|C)|C) = E\left(\frac{X - E(X|C)}{\sigma(X|C)}\middle|C\right)$$

$$= \frac{1}{\sigma(X|C)} \cdot E(X - E(X|C)|C)$$

$$= \frac{1}{\sigma(X|C)} \cdot E(X|C) - E(E(X|C)|C)$$

$$= \frac{1}{\sigma(X|C)} \cdot E(X|C) - E(X|C)$$

$$= \frac{1}{\sigma(X|C)} \cdot 0$$

$$\boldsymbol{E}(\boldsymbol{Res}(X|C)|C) = 0$$

Lampiran 2. Pembuktian $\boldsymbol{Var}(\boldsymbol{Res}(X|C)|C) = 1$

$$\boldsymbol{Var}(\boldsymbol{Res}(X|C)|C) = E((Res(X|C) - E(Res(X|C)|C)^2|C)$$

$$= E(Res(X|C)|C) - E(E(Res(X|C)|C)^2|C)$$

$$= 0 - E(Res(X|C)^2|C)$$

$$= E(Res(X|C)^2|C)$$

$$= E\left(\left(\frac{X - E(X|C)}{\sigma(X|C)}\right)^2\middle|C\right)$$

$$= \frac{1}{\left(\sigma(X|C)\right)^2} \cdot E\left(\left(X - E(X|C)\right)^2\middle|C\right)$$

$$= \frac{1}{\left(\sigma(X|C)\right)^2} \cdot \left(\sigma(X|C)\right)^2$$

$$\boldsymbol{Var}(\boldsymbol{Res}(X|C)|C) = 1$$

Lampiran 3. Pembuktian

$$\boldsymbol{Res}\left(\frac{P_{i,t}}{P_{i,s}}\middle|\mathcal{P}_i(s)\right) = \frac{\frac{P_{i,t}}{P_{i,s}} - \widehat{f_{s\to t}^{P}}}{\widehat{\sigma_{s\to t}^{P}}}\sqrt{P_{i,s}}$$

$$\boldsymbol{Res}\left(\frac{P_{i,t}}{P_{i,s}}\middle|\mathcal{P}_i(s)\right) = \frac{\frac{P_{i,t}}{P_{i,s}} - E\left(\frac{P_{i,t}}{P_{i,s}}\middle|\mathcal{P}_i(s)\right)}{\sigma\left(\frac{P_{i,t}}{P_{i,s}}\middle|\mathcal{P}_i(s)\right)}$$

$$= \frac{\frac{P_{i,t}}{P_{i,s}} - \widehat{f_{s\to t}^{P}}}{\sqrt{var\left(\frac{P_{i,t}}{P_{i,s}}\middle|\mathcal{P}_i(s)\right)}}$$

$$= \frac{\frac{P_{i,t}}{P_{i,s}} - \widehat{f_{s\to t}^{P}}}{\sqrt{\frac{(\widehat{\sigma_{s\to t}^{P}})^2}{P_{i,s}}}}$$

$$= \frac{\frac{P_{i,t}}{P_{i,s}} - \widehat{f_{s\to t}^{P}}}{\widehat{\sigma_{s\to t}^{P}}}\sqrt{P_{i,s}}$$

Lampiran 4. Pembuktian

$$\boldsymbol{Res}\left(\frac{I_{i,t}}{I_{i,s}}\middle|\mathcal{I}_i(s)\right) = \frac{\frac{I_{i,t}}{I_{i,s}} - \widehat{f_{s\to t}^{I}}}{\widehat{\sigma_{s\to t}^{I}}}\sqrt{I_{i,s}}$$

$$\boldsymbol{Res}\left(\frac{I_{i,t}}{I_{i,s}}\middle|\mathcal{I}_i(s)\right) = \frac{\frac{I_{i,t}}{I_{i,s}} - E\left(\frac{I_{i,t}}{I_{i,s}}\middle|\mathcal{I}_i(s)\right)}{\sigma\left(\frac{I_{i,t}}{I_{i,s}}\middle|\mathcal{I}_i(s)\right)}$$

$$= \frac{\frac{I_{i,t}}{I_{i,s}} - \widehat{f_{s\to t}^{I}}}{\sqrt{var\left(\frac{I_{i,t}}{I_{i,s}}\middle|\mathcal{I}_i(s)\right)}}$$

$$= \frac{\frac{I_{i,t}}{I_{i,s}} - \widehat{f_{s\to t}^{I}}}{\sqrt{\frac{(\widehat{\sigma_{s\to t}^{I}})^2}{I_{i,s}}}}$$

$$= \frac{\frac{I_{i,t}}{I_{i,s}} - \widehat{f_{s\to t}^{I}}}{\widehat{\sigma_{s\to t}^{I}}}\sqrt{I_{i,s}}$$

Lampiran 5. Pembuktian

$$\boldsymbol{Res}\left(Q_{i,s}{}^{-1}\middle|\mathcal{P}_i(s)\right) = \frac{Q_{i,s}{}^{-1} - \widehat{q_s}{}^{-1}}{\widehat{\rho_s^P}}\sqrt{P_{i,s}}$$

$$\boldsymbol{Res}\left(Q_{i,s}{}^{-1}\middle|\mathcal{P}_i(s)\right) = \frac{Q_{i,s}{}^{-1} - E\left(Q_{i,s}{}^{-1}\middle|\mathcal{P}_i(s)\right)}{\sigma\left(Q_{i,s}{}^{-1}\middle|\mathcal{P}_i(s)\right)}$$

$$= \frac{Q_{i,s}{}^{-1} - \widehat{q_s}{}^{-1}}{\sqrt{var\left(Q_{i,s}{}^{-1}\middle|\mathcal{P}_i(s)\right)}}$$

$$= \frac{Q_{i,s}{}^{-1} - \widehat{q_s}{}^{-1}}{\sqrt{\frac{(\widehat{\rho_s^P})^2}{P_{i,s}}}}$$

$$= \frac{Q_{i,s}{}^{-1} - \widehat{q_s}{}^{-1}}{\widehat{\rho_s^P}}\sqrt{P_{i,s}}$$

Lampiran 6. Pembuktian

$$\boldsymbol{Res}\left(Q_{i,s}\middle|\mathcal{I}_i(s)\right) = \widehat{\boldsymbol{Res}}(Q_{i,s}) = \frac{Q_{i,s} - \widehat{q_s}}{\widehat{\rho_s^I}}\sqrt{I_{i,s}}$$

$$\boldsymbol{Res}\left(Q_{i,s}\middle|\mathcal{I}_i(s)\right) = \frac{Q_{i,s} - E\left(Q_{i,s}\middle|\mathcal{I}_i(s)\right)}{\sigma\left(Q_{i,s}\middle|\mathcal{I}_i(s)\right)}$$

$$= \frac{Q_{i,s} - \widehat{q_s}}{\sqrt{var\left(Q_{i,s}\middle|\mathcal{I}_i(s)\right)}}$$

$$= \frac{Q_{i,s} - \widehat{q_s}}{\sqrt{\frac{(\widehat{\rho_s^I})^2}{I_{i,s}}}}$$

$$= \frac{Q_{i,s} - \widehat{q_s}}{\widehat{\rho_s^I}}\sqrt{I_{i,s}}$$