CORRECTIONS

ON APPLICATIONS OF EXCESS LEVEL PROCESSES TO (N,D)-POLICY BULK QUEUEING SYSTEMS

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In the above paper, published in the *Journal of Applied Mathematics and Stochastic Analysis* [1], several formulas and phrases are found to be erroneous. Although the listed below corrections fix the problems, the full corrected version reads better and is now available as a technical report [2].

Correction 1. Page 553, lines 13-19 should become:

... such that for each n , (X_n, Y_n) depend only on the n th interrenewal time $\tau_n - \tau_{n-1}$. Consequently,

$$(A, B, \tau) = \{(A_n = \sum_{k=0}^n X_k, B_n = \sum_{k=0}^n Y_k, \tau_n); n = 0, 1, \dots\} \quad (2.2)$$

is a three-dimensional delayed renewal process.

Process Z will be described in terms of the following transformations:

$$\gamma_0(z, \vartheta, \theta) = \mathbb{E}[z^{X_0} e^{-\vartheta Y_0 - \theta \tau_0}], \quad \gamma(z, \vartheta, \theta) = \mathbb{E}[z^{X_1} e^{-\vartheta Y_1 - \theta(\tau_1 - \tau_0)}],$$

$$|z| \leq 1, \operatorname{Re}(\vartheta) \geq 0, \operatorname{Re}(\theta) \geq 0, \quad (2.3)$$

$$\alpha_0(z) = \gamma_0(z, 0, 0), \quad \alpha(z) = \gamma(z, 0, 0), \quad (2.4)$$

$$\gamma_0(z, \vartheta) = \gamma_0(z, \vartheta, 0), \quad h_0(\theta) = \gamma_0(1, 0, \theta), \quad \gamma(z, \vartheta) = \gamma(z, \vartheta, 0), \quad h(\theta) = \gamma(1, 0, \theta), \quad (2.5)$$

Correction 2. Theorem 1 on page 554, lines 14-15, should be restated as follows:

Theorem 1. *Let (X_n, Y_n) be independent of $\tau_n - \tau_{n-1}$ for each n . Then,*

$$\frac{1}{h_0(\theta)} \mathfrak{T}^*(\xi, \theta, z, \vartheta; x, s) = \gamma_0(z, \vartheta) - \gamma_0(xz, \vartheta + s) \frac{1 - \xi h(\theta) \gamma(z, \vartheta)}{1 - \xi h(\theta) \gamma(xz, \vartheta + s)}. \quad (2.16)$$

Insert 3. Following Theorem 1, we add Theorem 1a:

Theorem 1a. *With no above assumption on the independence,*

$$\mathfrak{T}^*(\xi, \theta, z, \vartheta; x, s) = \gamma_0(z, \vartheta, \theta) - \gamma_0(xz, \vartheta + s, \theta) \frac{1 - \xi \gamma(z, \vartheta, \theta)}{1 - \xi \gamma(xz, \vartheta + s, \theta)}. \quad (2.16a)$$

Correction 4. Page 559, lines 10-12 should read:

$$\begin{aligned}\gamma(z, \vartheta, \theta) &= \mathbb{E}[z^{X_{1e}^*} - \vartheta Y_{1e}^* - \theta(\tau_1 - \tau_0)] \\ &= \mathbb{E}[\mathbb{E}[\mathbb{E}[z^{X_{1e}^*} - \vartheta Y_{1e}^* - \theta(\tau_1 - \tau_0)] \mid X_1^*] \mid \tau_1 - \tau_0] \\ &= \varphi\{\theta + \lambda[1 - \alpha(z\beta(\vartheta))]\}.\end{aligned}\quad (6.2)$$

The three-dimensional benchmark process, to which the busy period policy is applied, is now

$$(A, B, \tau) = \{(A_n = \sum_{k=0}^n X_k^*, B_n = \sum_{k=0}^n Y_k^*, \tau_n); n = 0, 1, \dots\}. \quad (6.3)$$

Correction 5. Page 559, line 16 should be corrected as

... the marginal transformation $\gamma(z, 0, 0)$ satisfies formula (6.1).

Correction 6. Page 559, lines 18-19 should read:

$$\begin{aligned}\mathbb{E}^0[\xi^{\nu_e} - \theta r_{\nu_z} A_{\nu}] \\ = 1 - [1 - \xi\varphi\{\theta + \lambda(1 - \alpha(z))\}] \mathfrak{L}_D \mathfrak{D}_x^{N-1} \left\{ \frac{1}{1 - \xi\varphi\{\theta + \lambda(1 - \alpha(xz\beta(s)))\}} \right\},\end{aligned}\quad (6.4)$$

References

- [1] Dshalalow J.H., On applications of excess level processes to (N,D)-policy bulk queueing systems, *JAMSA*, **9:4** (1996), 551-562.
- [2] Dshalalow J.H., On applications of excess level processes to (N,D)-policy bulk queueing systems, *Tech. Report*, **MS-19702** (1997), 1-12.