Supplemental file for the paper titled "Statistical Process Control Using Dynamic Sampling Scheme" by Zhonghua Li and Peihua Qiu

To save some space in the paper of the above title, some numerical results are presented in this supplemental file.

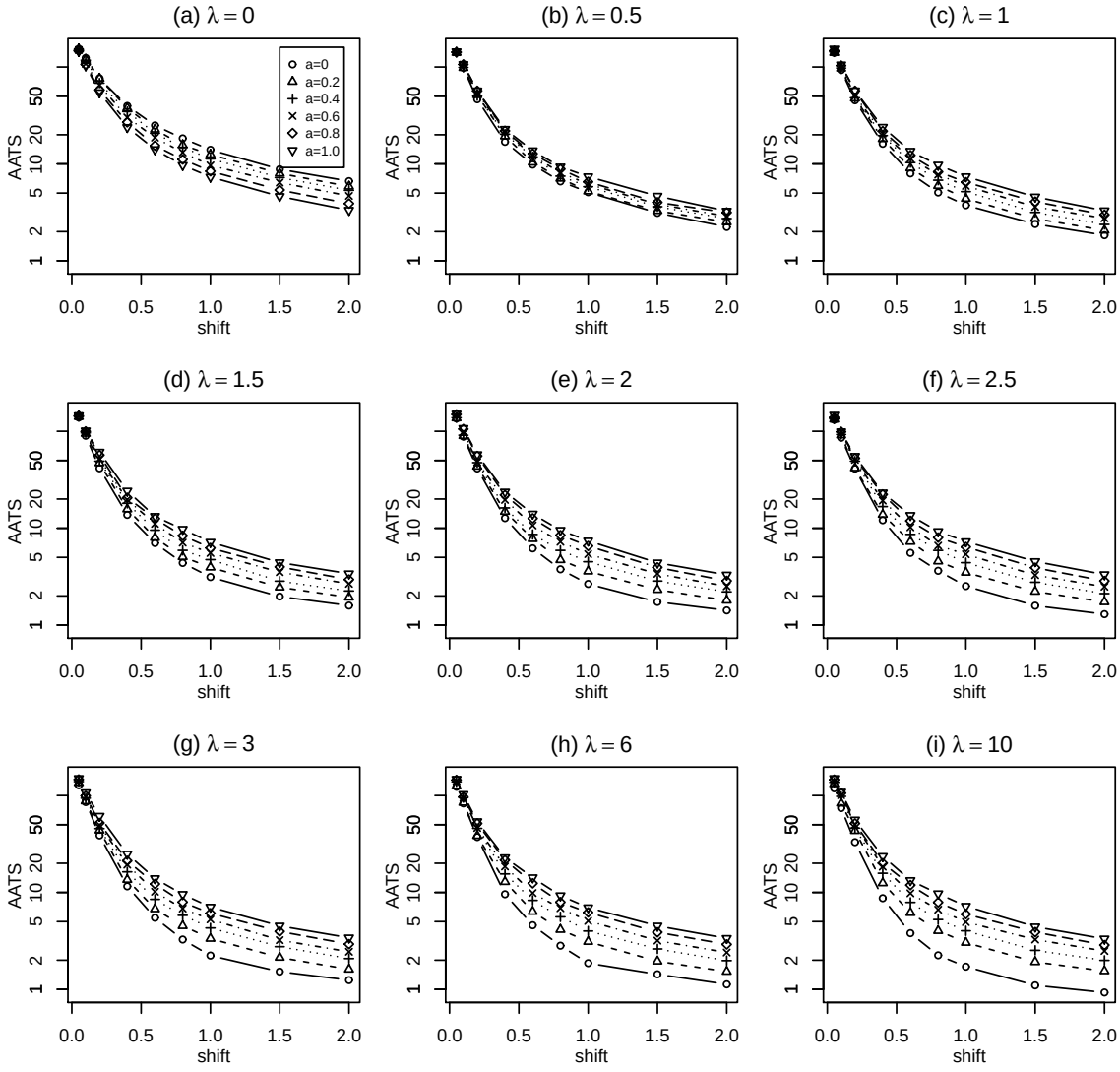

Figure 1: $AATS_1$ values of the chart (2)–(3) when the IC process distribution is $N(0,1)$, the mean shift size at the initial observation time is 0.05, 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.5, or 2.0, $ATS_0 = 200$, $k = 0.25$, a changes its value among 0, 0.2, 0.4, 0.6, 0.8 and 1.0, and $\lambda = 0$ (plot (a)), $\lambda = 0.5$ (plot (b)), $\lambda = 1$ (plot (c)), $\lambda = 1.5$ (plot (d)), $\lambda = 2$ (plot (e)), $\lambda = 2.5$ (plot (f)), $\lambda = 3$ (plot (g)), $\lambda = 6$ (plot (h)), or $\lambda = 10$ (plot (i)).

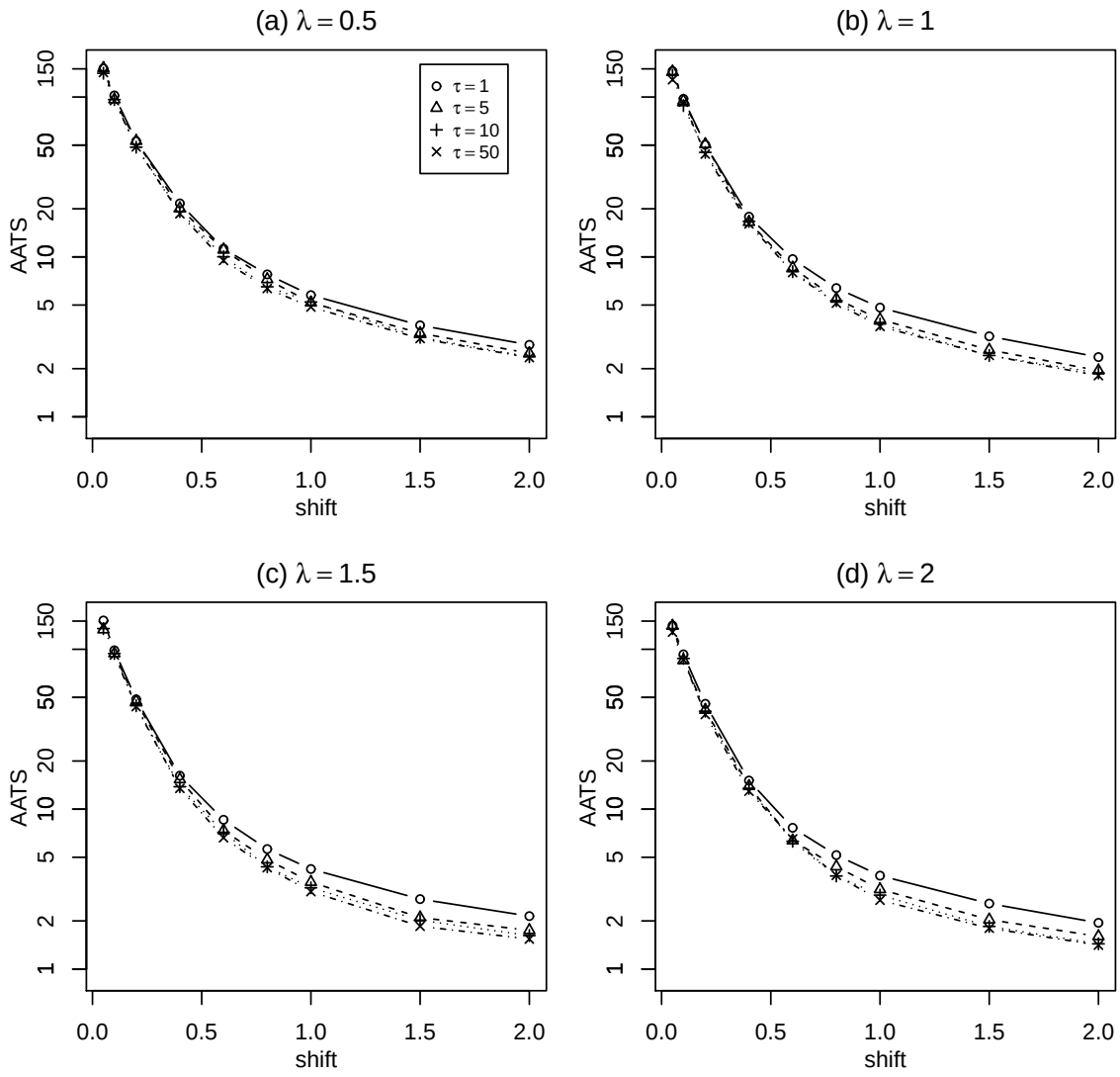

Figure 2: $AATS_1$ values of the chart (2)–(3) when the IC process distribution is $N(0,1)$, the mean shift size at the initial observation time is 0.05, 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.5, or 2.0, $ATS_0 = 200$, $k = 0.25$, and the shift time $\tau = 1, 5, 10$, or 50. In the chart, a is chosen 0, and λ is chosen 0.5 (plot (a)), 1 (plot (b)), 1.5 (plot (c)), and 2 (plot (d)).

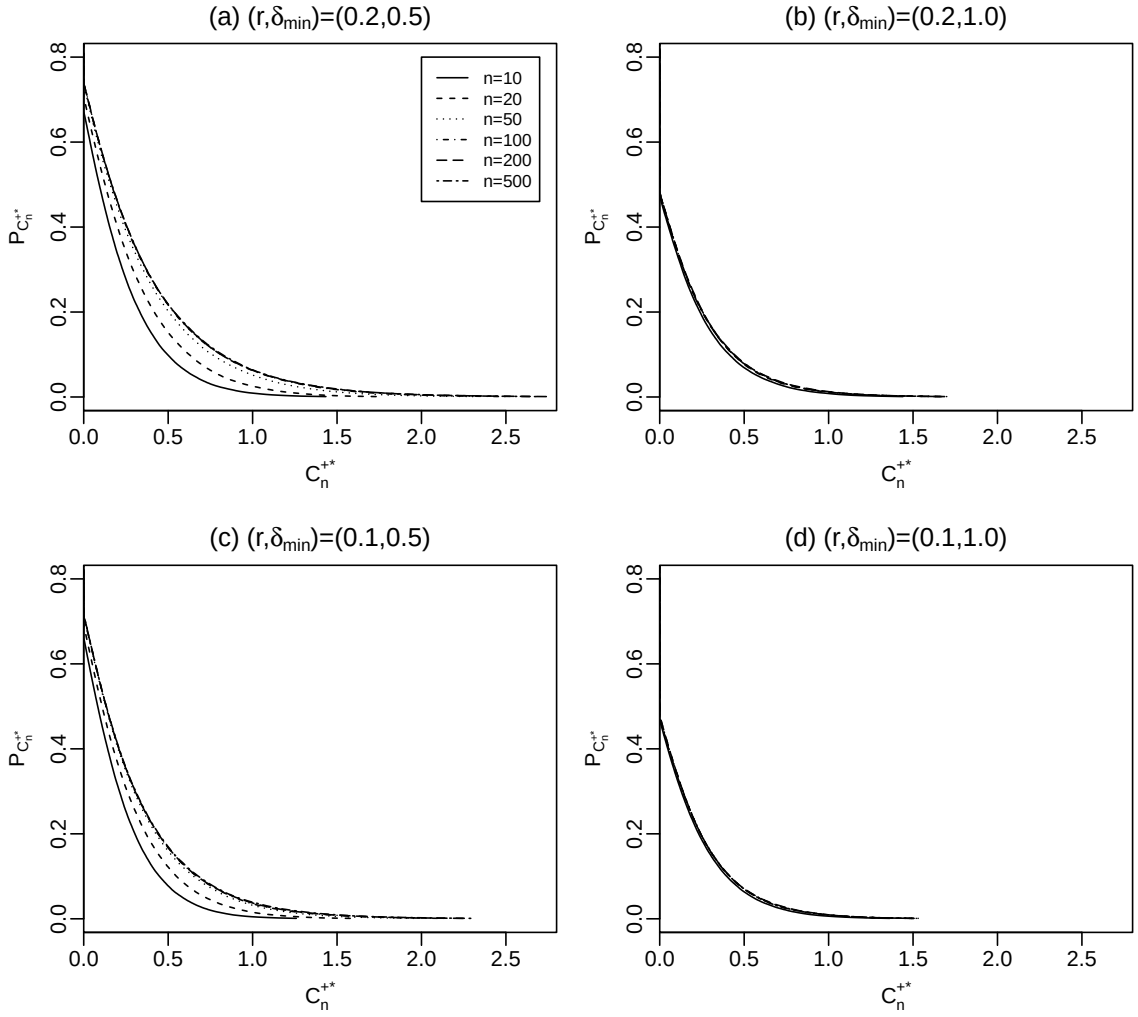

Figure 3: p-value $P_{C_n^{+*}}$ computed from the empirical distribution of C_n^+ defined by (6) in cases when $n = 10$, 20, 50, 100, 200 and 500, and when $(r, \delta_{\min}) = (0.1, 0.5)$ (plot (a)), $(r, \delta_{\min}) = (0.2, 0.5)$ (plot (b)), $(r, \delta_{\min}) = (0.1, 1.0)$ (plot (c)), and $(r, \delta_{\min}) = (0.2, 1.0)$ (plot (d)).

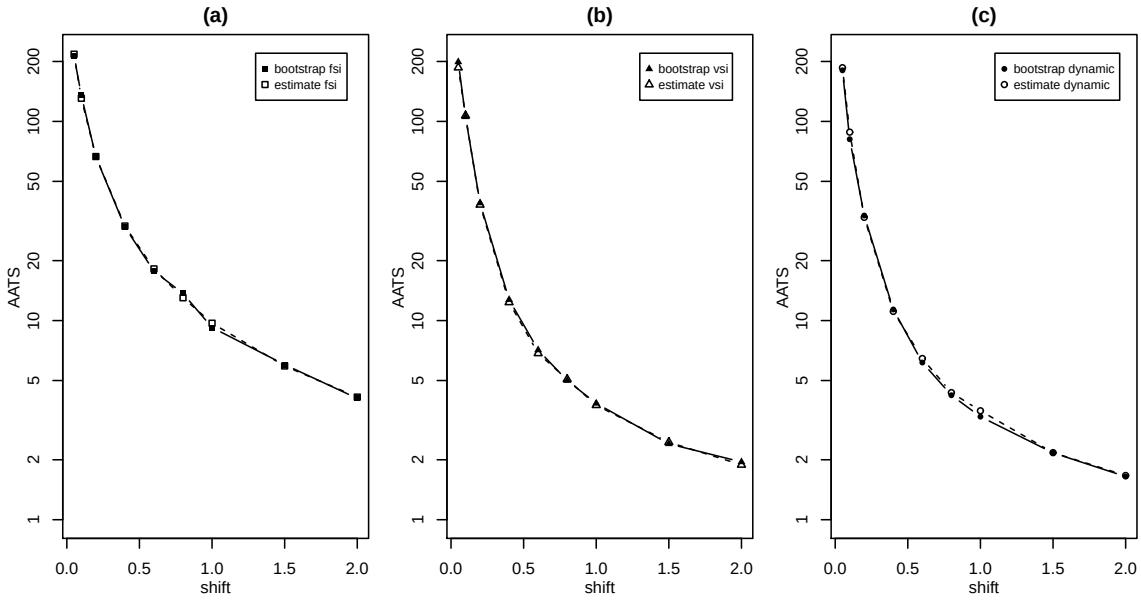

Figure 4: $AATS_1$ values of the control chart (1)–(2) when its reference value k is chosen by the adaptive selection scheme, and the sampling interval function $d(\cdot)$ is chosen by (i) the fixed sampling interval (FSI) scheme $d(C_n^+) = 1$, (ii) the conventional 2-interval VSI scheme defined by equation (7), and (iii) the dynamic VSI scheme defined by equation (5). Plots (a)-(c) show the $AATS_1$ values computed by the bootstrap approach and the distribution estimation approach for the three different sampling schemes, respectively. In this example, ATS_0 is fixed at 400.

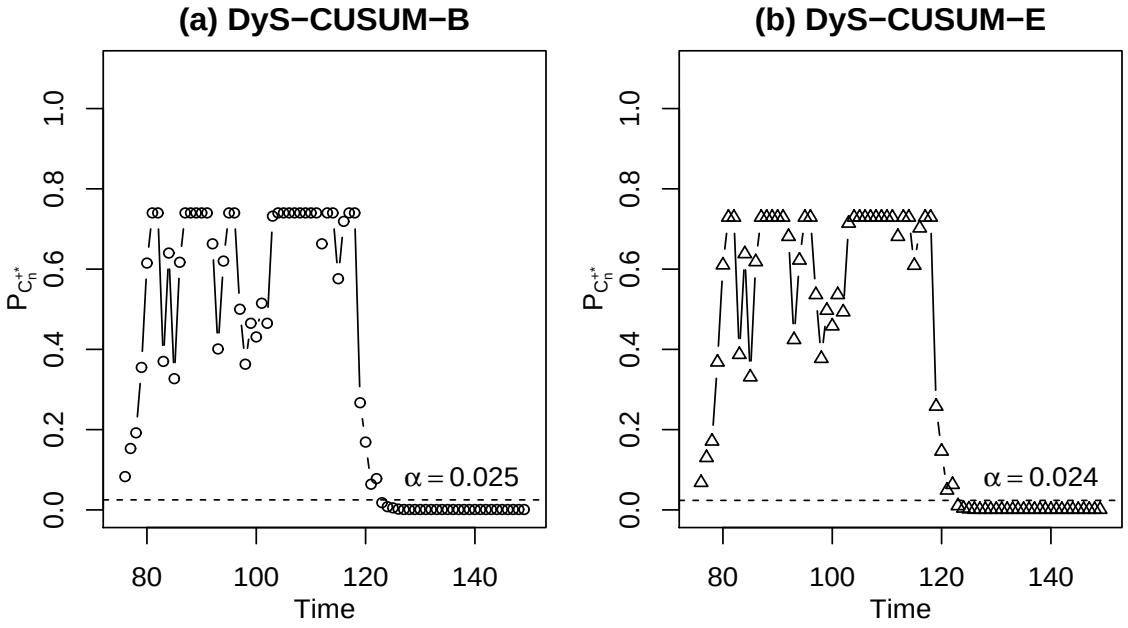

Figure 5: Control charts DyS-CUSUM-B (plot (a)) and DyS-CUSUM-E (plot (b)) for monitoring the triglyceride chemical process. The horizontal dashed lines in the plots denote the significance levels of the two charts such that $ARL_0 = 400$ for both charts.