

CORRECTION

CENTRAL LIMIT THEOREMS FOR THE WASSERSTEIN DISTANCE BETWEEN THE EMPIRICAL AND THE TRUE DISTRIBUTIONS

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There is an error in Proposition 6.4 of our paper. It comes from a wrong expression for the covariance, $K(\rho)$, between $|Z_1|$ and $|Z_2|$, where (Z_1, Z_2) is a centered random vector with bivariate normal distribution such that $\text{Var}(Z_1) = \text{Var}(Z_2) = 1$ and $\text{Cov}(Z_1, Z_2) = \rho$. The formula for $K(\rho)$ should read

$$K(\rho) = \frac{2}{\pi}(\rho \arcsin \rho + \sqrt{1 - \rho^2} - 1), \quad \rho \in [-1, 1],$$

[see, e.g., Nabeya (1951) or Wellner and Smythe (2002), Proposition 2]. Hence, using the notation in the proof of Proposition 6.4, $K(\rho) = K_1(\rho) + K_3(\rho)$. The core of that proof remains valid, except that we should drop the contribution of K_2 to the limit in (6.14). Consequently, Proposition 6.4 should be restated as follows.

PROPOSITION 6.4. *Let Q be the quantile function of a random variable X in $DA_2(b_n)$. Assume X has regularly varying tails with exponent -2 and $\mathbb{E}X^2 = \infty$. Let B be a Brownian bridge and let G_n be as defined by (6.9). Then*

$$(6.14) \quad \lim_{n \rightarrow \infty} \mathbb{E}G_n^2 = 1 - \frac{2}{\pi}(2 - \log 2).$$

This amendment carries over to Theorems 6.7 and 6.8. The limiting distribution (6.42) in Theorem 6.7 should be

$$(6.42) \quad \frac{Z_n - \gamma_n}{b_n} \xrightarrow{d} \sqrt{1 - \frac{2}{\pi}(2 - \log 2)g}.$$

Also, in this theorem, the dividing term $\alpha + 1$ in the expression for the constants b_n , case $\alpha = -1$, should be replaced by 1. This also occurs in Theorem 6.8, where, moreover, there is a factor of 2 missing [see (6.25) and (6.26)]. The correct statement for Theorem 6.8 is:

THEOREM 6.8. *Let $V(t)$, $t \in \mathbb{R}$, be a stationary Ornstein–Uhlenbeck process and let $\alpha \in [-2, \infty)$. Then:*