# TBATS: What Does It Stand For?

**T** — **Trigonometric**

Fourier terms for seasonality

$$\sum[a_n \cos(\tfrac{2\pi n t}{m}) + b_n \sin(\tfrac{2\pi n t}{m})]$$

**B** — **Box-Cox**

Variance stabilization

$$y^{(\omega)} = (y^{\omega} - 1)/\omega$$

**A** — **ARMA**

Error autocorrelation

$$\phi(L) d_t = \theta(L) \varepsilon_t$$

**T** — **Trend**

Level + slope (possibly damped)

$$\ell_t = \ell_{t-1} + \phi b_{t-1}$$

**S** — **Seasonal**

Multiple seasonal periods

$$m_1, m_2, \ldots, m_T$$