Appendix 1: Full Forecast Partition

Forecast variance is equal to

$$\begin{aligned} V_{T+q}^{(F)} = & V_{T+q}^{(I)} + V_{T+q}^{(PA)} + V_{T+q}^{(D)} + V_{T+q}^{(PS)} \\ & + \varepsilon_{T+q}^{(I,PA)} + \varepsilon_{T+q}^{(I,D)} + \varepsilon_{T+q}^{(I,PS)} + \varepsilon_{T+q}^{(PA,PS)} + \varepsilon_{T+q}^{(PA,D)} + \varepsilon_{T+q}^{(D,PS)} \\ & + \varepsilon_{T+q}^{(I,PA,D)} + \varepsilon_{T+q}^{(I,PA,PS)} + \varepsilon_{T+q}^{(I,D,PS)} + \varepsilon_{T+q}^{(PA,D,PS)} \\ & + \varepsilon_{T+q}^{(I,PA,D,PS)}, \end{aligned} \tag{1}$$

with interaction terms calculated as

$$\varepsilon_{T+q}^{(I,PA)} = V_{T+q}^{(I+PA)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(PA)}\right] \tag{2}$$

$$\varepsilon_{T+q}^{(I,D)} = V_{T+q}^{(I+D)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(D)}\right] \tag{3}$$

$$\varepsilon_{T+q}^{(I,PS)} = V_{T+q}^{(I+PS)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(PS)}\right] \tag{4}$$

$$\varepsilon_{T+q}^{(PA,D)} = V_{T+q}^{(PA+D)} - \left[V_{T+q}^{(PA)} + V_{T+q}^{(D)}\right] \tag{5}$$

$$\varepsilon_{T+q}^{(PA,PS)} = V_{T+q}^{(PA+PS)} - \left[V_{T+q}^{(PA)} + V_{T+q}^{(PS)}\right] \tag{6}$$

$$\varepsilon_{T+q}^{(D,PS)} = V_{T+q}^{(D+PS)} - \left[V_{T+q}^{(D)} + V_{T+q}^{(PS)}\right] \tag{7}$$

$$\varepsilon_{T+q}^{(I,PA,D)} = V_{T+q}^{(I+PA+PD)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(PA)} + V_{T+q}^{(D)}\right] - \left[\varepsilon_{T+q}^{(I,PA)} + \varepsilon_{T+q}^{(I,D)} + \varepsilon_{T+q}^{(PA,D)}\right] \tag{8}$$

$$\varepsilon_{T+q}^{(I,PA,PS)} = V_{T+q}^{(I+PA+PS)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(PA)} + V_{T+q}^{(PS)}\right] - \left[\varepsilon_{T+q}^{(I,PA)} + \varepsilon_{T+q}^{(I,PS)} + \varepsilon_{T+q}^{(PA,PS)}\right] \tag{9}$$

$$\varepsilon_{T+q}^{(I,D,PS)} = V_{T+q}^{(I+D+PS)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(D)} + V_{T+q}^{(PS)}\right] - \left[\varepsilon_{T+q}^{(I,D)} + \varepsilon_{T+q}^{(I,PS)} + \varepsilon_{T+q}^{(D,PS)}\right] \tag{10}$$

$$\varepsilon_{T+q}^{(PA,D,PS)} = V_{T+q}^{(PA+D+PS)} - \left[V_{T+q}^{(PA)} + V_{T+q}^{(D)} + V_{T+q}^{(PS)}\right] - \left[\varepsilon_{T+q}^{(PA,D)} + \varepsilon_{T+q}^{(PA,PS)} + \varepsilon_{T+q}^{(D,PS)}\right] \tag{11}$$

$$\begin{aligned} \varepsilon_{T+q}^{(I,PA,D,PS)} = & V_{T+q}^{(F)} - \left[V_{T+q}^{(I)} + V_{T+q}^{(PA)} + V_{T+q}^{(D)} + V_{T+q}^{(PS)}\right] \\ & - \left[\varepsilon_{T+q}^{(I,PA)} + \varepsilon_{T+q}^{(I,D)} + \varepsilon_{T+q}^{(I,PS)} + \varepsilon_{T+q}^{(PA,D)} + \varepsilon_{T+q}^{(PA,PS)} + \varepsilon_{T+q}^{(D,PS)}\right] \\ & - \left[\varepsilon_{T+q}^{(I,PA,D)} + \varepsilon_{T+q}^{(I,PA,PS)} + \varepsilon_{T+q}^{(I,D,PS)} + \varepsilon_{T+q}^{(PA,D,PS)}\right] \end{aligned} \tag{12}$$

which simplifies to

$$\textbf{Two-way interactions:} \quad \gamma^{(i,j)} = V^{(i+j)} - \sum_{m=(i,j)} V^{(m)} \tag{13}$$

$$\textbf{Three-way interactions:} \quad \varepsilon^{(i,j,k)} = V^{(i+j+k)} - \sum \boldsymbol{\gamma} - \sum_{m=(i,j,k)} V^{(m)} \tag{14}$$

$$\textbf{Four-way interactions:} \quad \Delta^{(i,j,k,l)} = V^{(i+j+k+l)} - \sum \boldsymbol{\varepsilon} - \sum \boldsymbol{\gamma} - \sum_{m=(i,j,k,l)} V^{(m)} \tag{15}$$

$$\tag{16}$$