Appendix VI: Estimating Weekly Demand Uncertainty from Monthly Data

The standard deviation of demand uncertainty used in the safety stock equation is a measure of the *weekly* uncertainty of real demand about the plan. Ideally, data should be taken on a weekly basis so that this statistic can be estimated directly as the sample standard deviation of the difference between the weekly plan and the actual demand. However, it is fairly common that such data is not readily available. Typically, the factory has data aggregated at the monthly level for comparing plans to actual demand. An estimate of weekly demand uncertainty can still be obtained if we make a simplifying assumption about the interdependence of the demand uncertainty from week to week.

Assumption: Demand uncertainties are independent from week to week within a month, that is, knowing the difference between the actual demand and the plan for this week does not give you any information for predicting the difference between the actual demand and the plan next week. If this is the case, then

$$52\sigma^2_{weekly} = 13\sigma^2_{monthly}$$

or

$$\sigma_{weekly} = \sqrt{\frac{3}{13}}\,\sigma_{monthly}.$$