

## Chapter 2

### Exercises

1. (a)  $\alpha = 0.1$ .

(b)  $\alpha = 0.1$  remains the best fit under different initial estimates.

2. Three-year moving average forecast for 2013 =  $\frac{55 + 70 + 80}{3} \approx 68$ .

Linear trend model (2006 as year 1)  $d_t = 11.25t$ ,  $d_8 = 11.25 \times 8 = 90$ .

Linear trend model provides better fit.

3.  $\hat{a}_0 = 2$ ,  $\hat{b}_0 = 3$ ; forecast always equals actual demand.
4. Yearly average = 141.25, constant over three years.

Seasonal indices are 0.708, 0.873, 1.699, and 0.720 for quarters I, II, III, and IV, respectively.

Forecasts are 100, 123, 240, and 102 for quarters I, II, III, and IV respectively; identical to averaging quarterly sales over the three years.

5. Quarterly sales are 140, 35, 35, and 70.

Tracking signals for the current year are 0, 5.79, 6.05, and 12.41. Model may be underestimating demand.

### Problem

Use actual demand at Mega Mart and sales to other super markets as the historical data to build a seasonal forecasting model. The seasonal indices are 0.8327, 0.8516, 1.4710, and 0.8447 for quarters I, II, III, and IV, respectively. The forecast for the next three years are as follows:

Quarter Year	I	II	III	IV
2013	942	963	1663	955
2014	981	1003	1733	995
2015	1021	1044	1803	1036

Assume no inventory at the end of each quarter, the total cost (3 years) when using the public warehouse is \$636,255. If a private warehouse is used exclusively, the warehouse must be large enough to store 1,803 thousand pounds of rice, the highest quarterly forecast. The total cost is \$710,568. OTC should use a combination of public and private warehouse. It should lease 963 square feet of private warehouse and store extra inventory in the public warehouse. The total cost using this plan is \$544,764.