DECOMPOSITION OF A TIME SERIES

Patterns that may be present in a time series

Trend: Data exhibit a steady growth or decline over time.

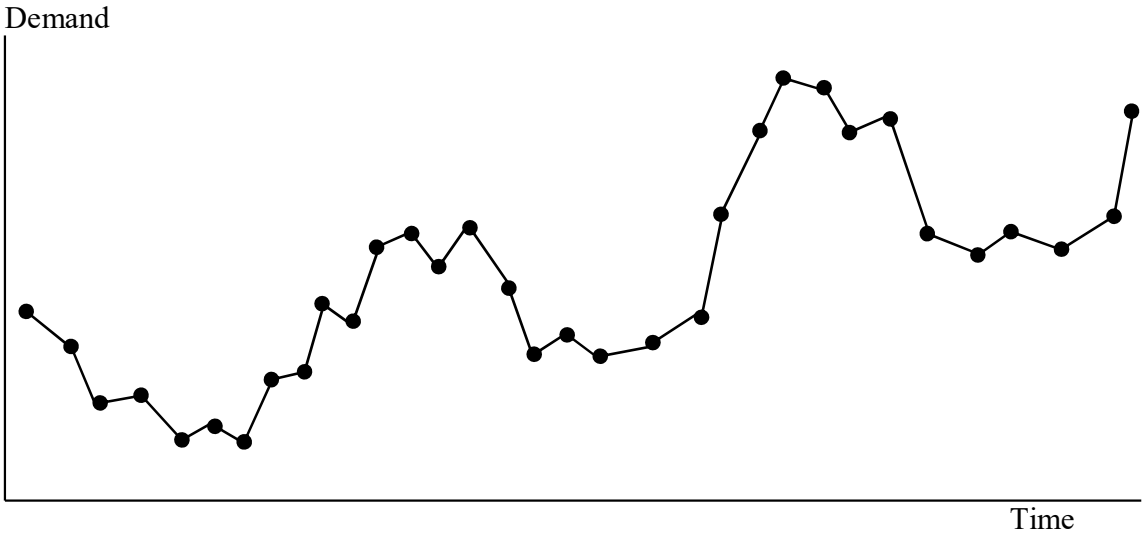
Seasonality: Data exhibit upward and downward swings in a short to intermediate time frame (most notably during a year).

Cycles: Data exhibit upward and downward swings in over a very long time frame.

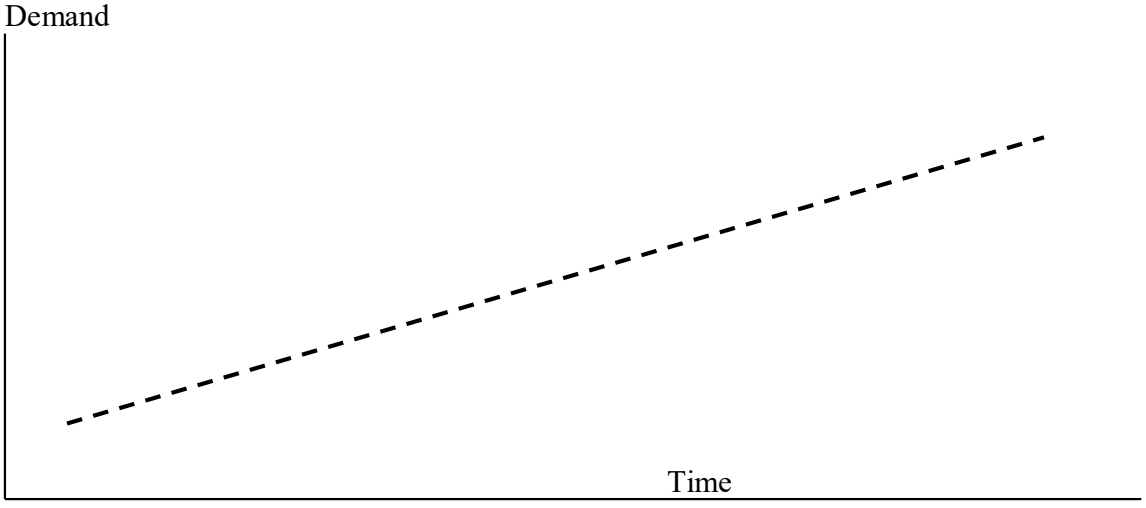
Random variations: Erratic and unpredictable variation in the data over time with no discernable pattern.

ILLUSTRATION OF TIME SERIES DECOMPOSITION

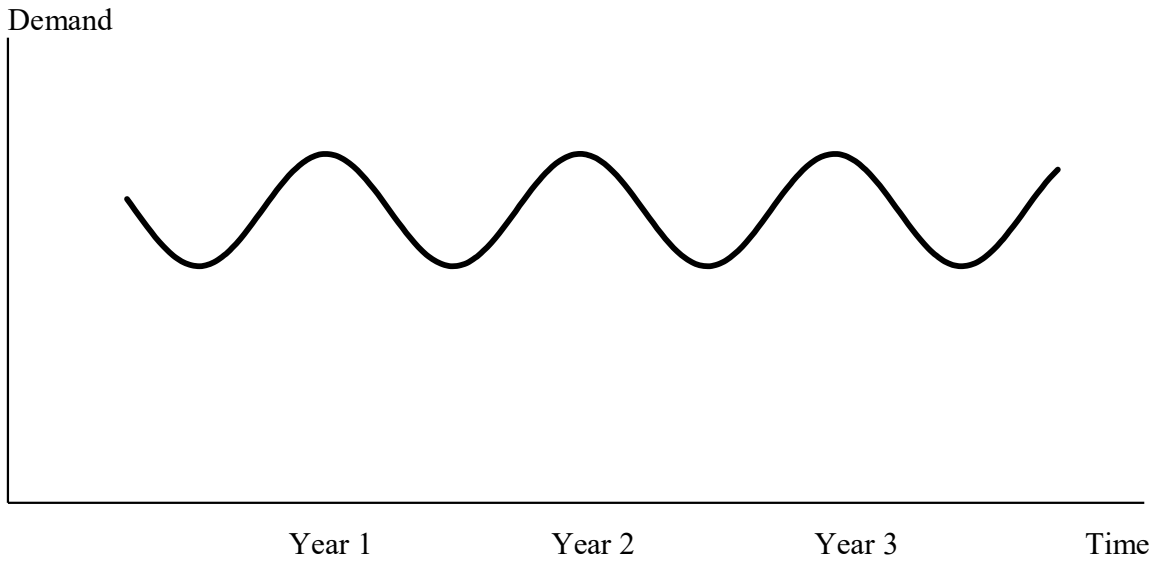
Hypothetical Pattern of Historical Demand



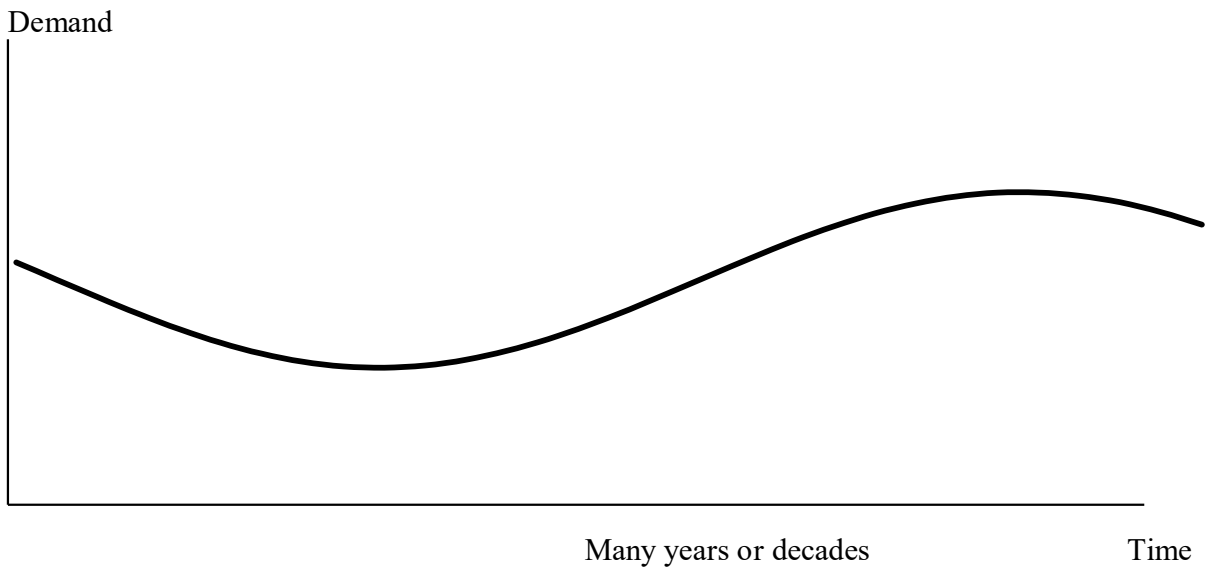
TREND COMPONENT IN HISTORICAL DEMAND



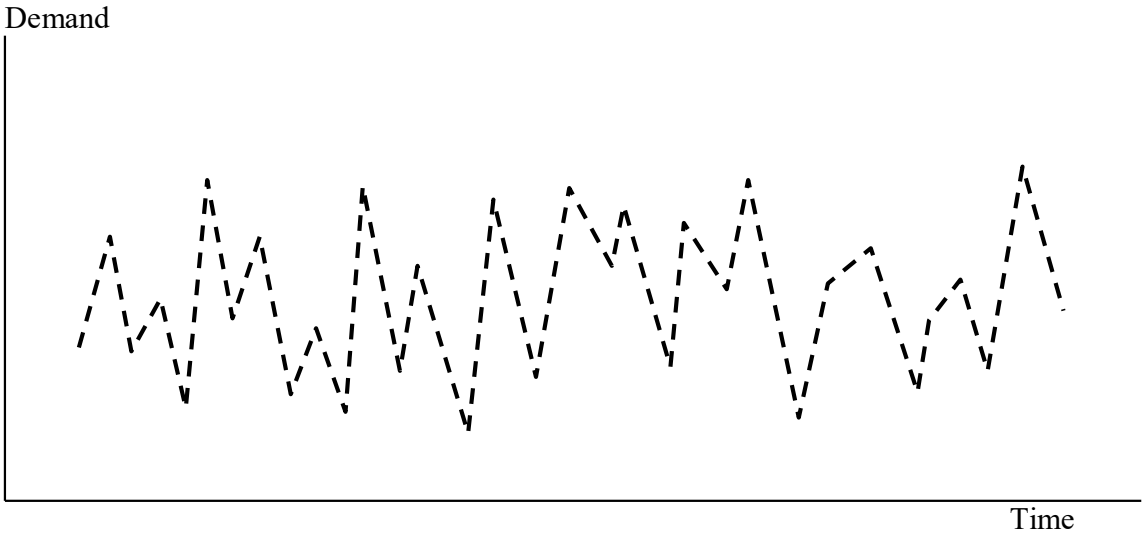
SEASONAL COMPONENT IN HISTORICAL DEMAND



CYCLE COMPONENT IN HISTORICAL DEMAND



RANDOM COMPONENT IN HISTORICAL DEMAND



DATA SET TO DEMONSTRATE FORECASTING METHODS

The following data set represents a set of hypothetical demands that have occurred over several consecutive years. The data have been collected on a quarterly basis, and these quarterly values have been amalgamated into yearly totals.

For various illustrations that follow, we may make slightly different assumptions about starting points to get the process started for different models. In most cases we will assume that each year a forecast has been made for the subsequent year. Then, after a year has transpired we will have observed what the actual demand turned out to be (and we will surely see differences between what we had forecasted and what actually occurred, for, after all, the forecasts are merely educated guesses).

Finally, to keep the numbers at a manageable size, several zeros have been dropped off the numbers (i.e., these numbers represent demands in thousands of units).

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Annual Demand
1	62	94	113	41	310
2	73	110	130	52	365
3	79	118	140	58	395
4	83	124	146	62	415
5	89	135	161	65	450
6	94	139	162	70	465