

Chapter 14

Fundamentals of Data Visualization

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Visualizing Trends

- When making scatter plots or time series, we are often more interested in the overarching trend of the data than in the specific detail.
- By drawing the trend we can create a visualization that helps the reader immediately see key features of the data.
- There are two fundamental approaches to determining a trend:
 - We can smooth the data by some method.
 - We can fit a curve with a defined functional form.
- Once we have identified a trend we can look specifically at deviations from the trend.
- Or we can separate the data into multiple components, including the underlying trend, any existing cyclical components, and episodic components or random noise.

Dow Jones for 2009



- How can we show the dominant trends without the noise?

Smoothing

- To generate a moving average, we take a time window, say the first 20 days in the time series.
- Calculate the average price over these 20 days.
- Then move the time window by one day, so it now spans the 2nd to 21st day.
- Calculate the average over these 20 days.
- Move the time window again, and so on.
- The result is a new time series consisting of a sequence of averaged prices.

- Financial analysts usually plot the smooth curve at the end point.
- Statisticians usually plot the smooth curve at the center of the window.

