Airline on-time performance, measured by the percent of flights arriving at their destination on time, has attracted growing interest in recent years as the number of air travelers has increased. Figure 1 provides a graph of the percent of U.S. major air carriers' domestic flights arriving on time from January 2001 to December 2010. The time series data in the graph exhibits strong seasonal variation, which masks the underlying trend.

Seasonality of the on-time arrival data can be viewed separately. One way to observe the seasonal patterns in the data, unaffected by the impact of changing long-term trends, is to calculate the monthly seasonal factors—as shown in figure 2. Such cyclical increases and decreases can suppress or magnify the underlying trend, depending on if they are in synchronization or out of synchronization with the direction the overall trend is taking. For example, growth in overall on-time arrivals may actually be masked if a seasonal decrease skews the number of on-time arrivals downward. Conversely, an increase in overall on-time arrivals can be magnified by a seasonal increase. Decreases or leveling in the overall trend can also be similarly masked by seasonal fluctuations.

Seasonality is the systematic, although not necessarily regular, intrayear movement caused by the changes of the weather, the calendar, and timing of decision, directly or indirectly through the production and consumption decisions made by the agents of the economy.”


Figure 1: U.S. Major Air Carriers Domestic On-Time Arrivals (percent of total scheduled domestic operations), January 2001–December 2010

As the histogram shows, the seasonal factors exhibit a distinctive pattern—typically higher percentages of on-time arrivals in the spring and fall, and lower percentages in summer and winter (attributable to increased travel and severe weather).

Once the seasonality is removed from the data, the long-term trend of on-time arrivals becomes more obvious. Figure 3, which compares the actual data to the underlying trend, indicates a significant decrease in on-time arrivals in the month of September 2001. The trendline also indicates a decline in on-time arrivals from 2003 through 2007. However, the trend of on-time arrivals rose in 2008 before becoming relatively level in 2009 and 2010. The seasonality of the data tended to mask the level trend over these last 2 years.

**Figure 2:** Monthly Seasonal Factors for U.S. Major Air Carriers Domestic On-Time Arrivals, (expressed as percentage point differences relative to the trend), based on data from January 2001 to December 2010

**Figure 3:** U.S. Major Air Carriers Domestic On-Time Arrivals (percent of total scheduled domestic operations)—Actual and Underlying Trend, January 2001—December 2010