Executive Summary

The purpose of this report is to determine the *data pattern* of Consolidated Edison Company's quarterly revenue from 1985 till 1999. Only from understanding the data pattern that we can choose to right model to forecast the company's quarterly revenues for 2000 reasonably well. Datafile that we use are collected quarterly revenue from Consolidated Edison Company from 1985 till 1999.

First, we plot AutoCorrelation graph of the datafile (see Figure 1 in Appendix). The graph shows a declining line that starts from positive value outside control limit and ends with negative value inside control limit. This is a clear indication of a *trend*. But the graph also showing some sign of seasonality with peaks along the declining line.

To confirm the seasonality, we take a first difference of the first graph to reduce the strength of the trend (see Figure 2). Once the trend indication or the declining line has been removed, a seasonality indication or the peaks are amplified, confirming the datafile has *seasonality* as well. Next we amplify the seasonality further to determine the strength and length of the seasonality

If we take a second difference of the first graph, the indication of the seasonality is getting stronger (see Figure 3). This allows us to check the length of the seasonality by observing its peaks at 4, 8, and 12. Thus we can say that the length of this *strong seasonality* is *four* or an *annual seasonality* in this case. Now we can check linearity of the trend.

We can determine the linearity of the trend by taking a long or seasonal difference of the datafile, thus reducing the strength of the seasonality (see Figure 4). The first seasonal difference has dispersed the seasonality into a stationary, an indication that the datafile has a linear trend. We can confirm this linearity further by inspecting the scatter plot of the datafile (see Figure 5). A visual observation of the plot does indicate that the data does have a *linear trend*.

Overall, the data file has a *strong seasonality* pattern of *four periods*, or *annual seasonality* in this case, and has a-*linear trend* pattern as well.

Appendix:

Figure 1: AutoCorrelation plot (number of lags: 29, degree of differencing: 0)

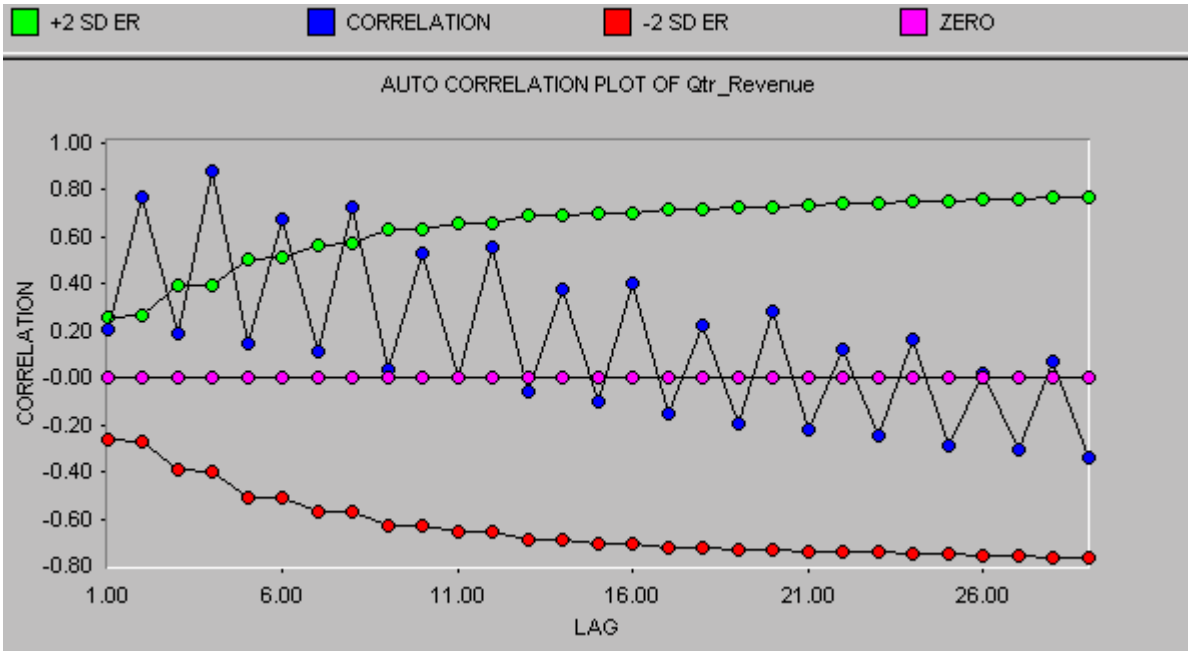

Figure 2: AutoCorrelation plot (number of lags: 29, degree of differencing: 1)

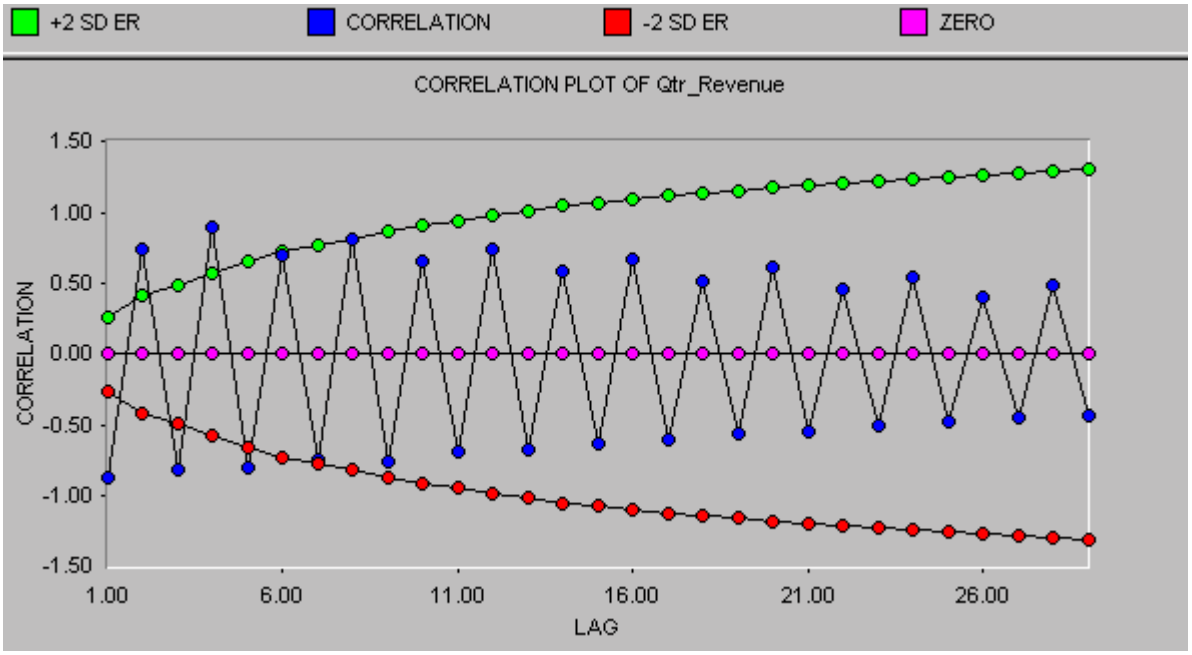

Figure 3: AutoCorrelation plot (number of lags: 29, degree of differencing: 2)

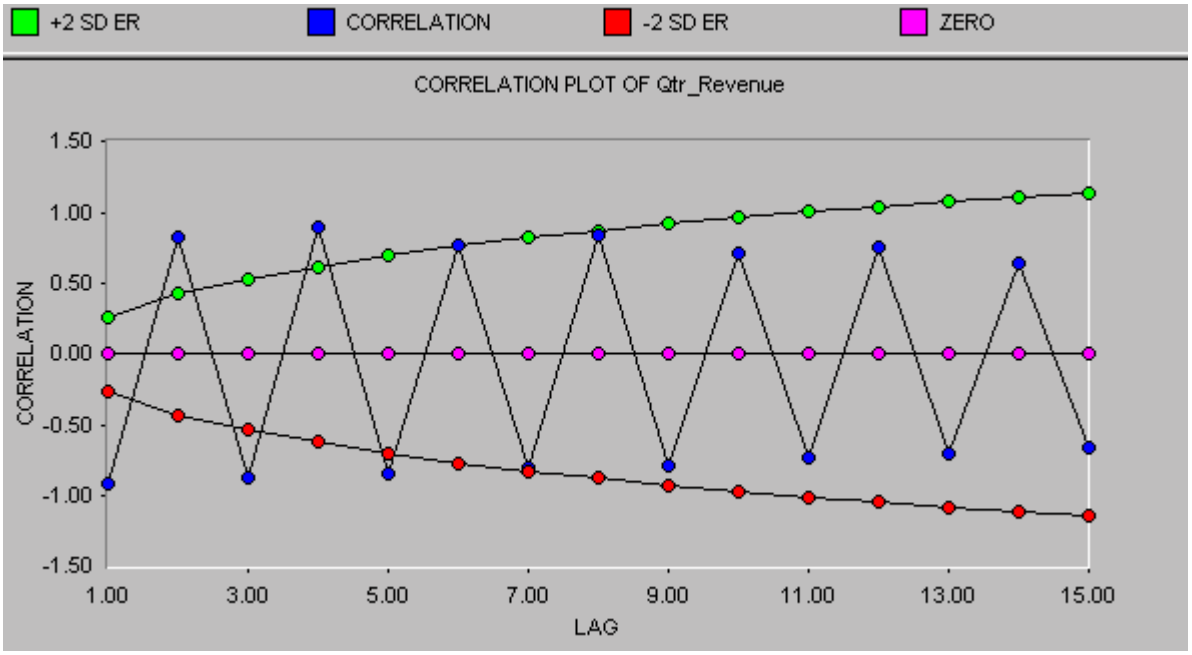

Figure 4: AutoCorrelation plot (no of lags: 29, seasonal periods: 4, degree of seasonal differencing: 1)

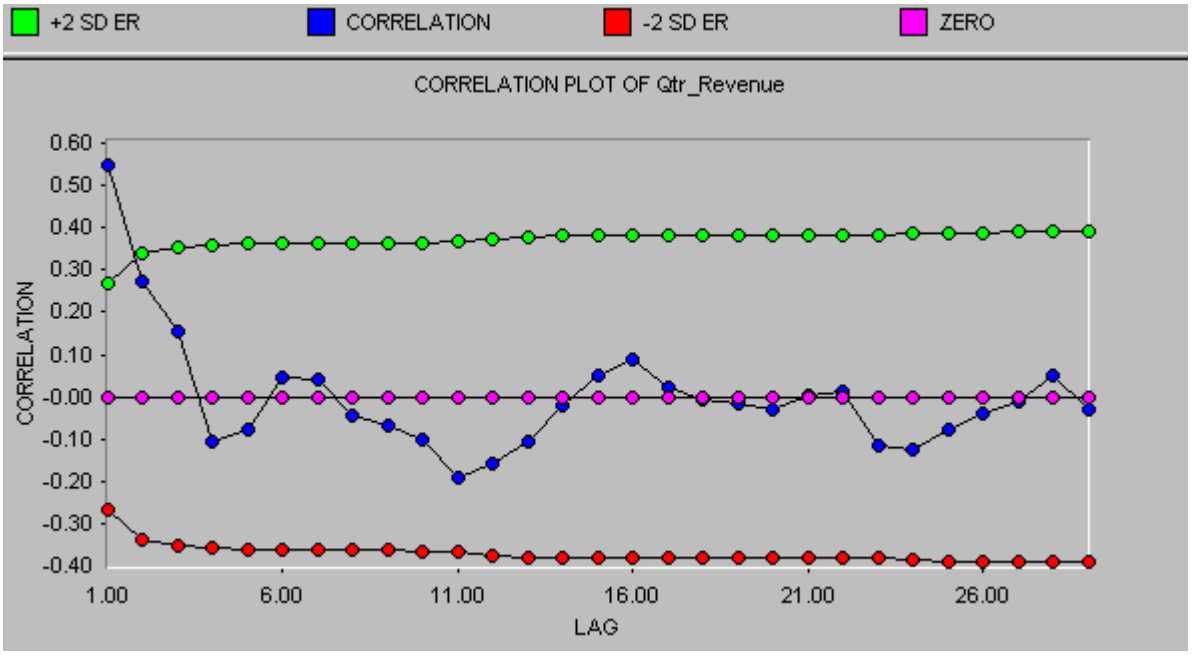

Figure 5: Scatter plot