Modeling Weekly Data

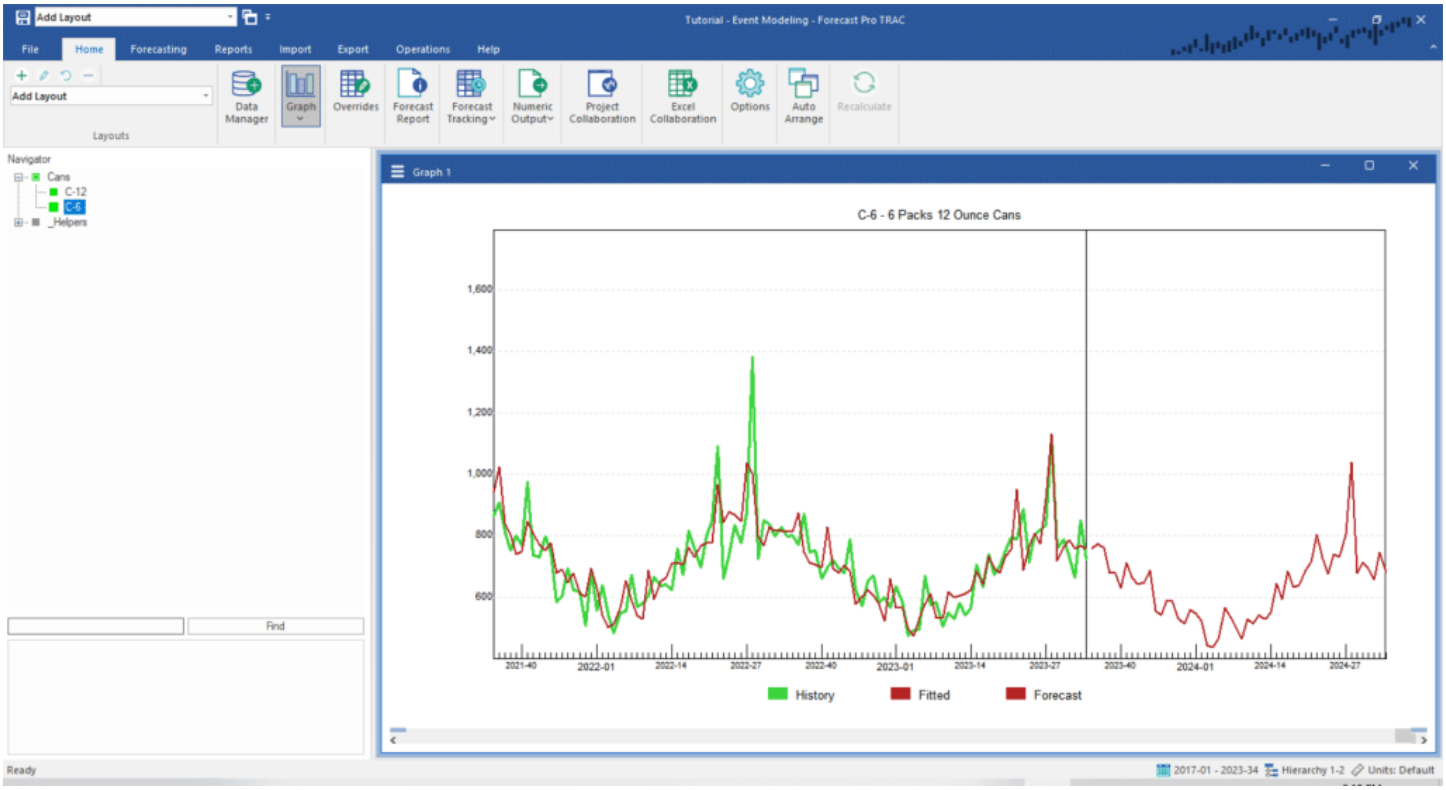
Building Event Models · https://www.forecastpro.com/documentation/forecast-pro-trac/building-event-models/modeling-weekly-data/

Start Forecast Pro and open the project, *Tutorial - Event Modeling*. In this exercise we will model weekly beer sales for a brand of beer in various package configurations.

Select C-6 on the Navigator. C-6 represents sales of beer packaged in cans and sold in 6-packs.

In order to get a better view of the data, right click on the graph to invoke its' context menu and select **Zoom**.

Add the fitted values to the graph using the graph's context menu.



One noticeable feature of this data set is that sales for the weeks containing the three US summer holidays (Memorial Day, 4th of July, Labor Day) are higher than other weeks. If you look closely at the data by scrolling across the graph, you'll notice that these holidays sometimes change weeks, and when this occurs, the fit can be poor. For instance, the 4th of July fell in week 27 before 2020, but fell

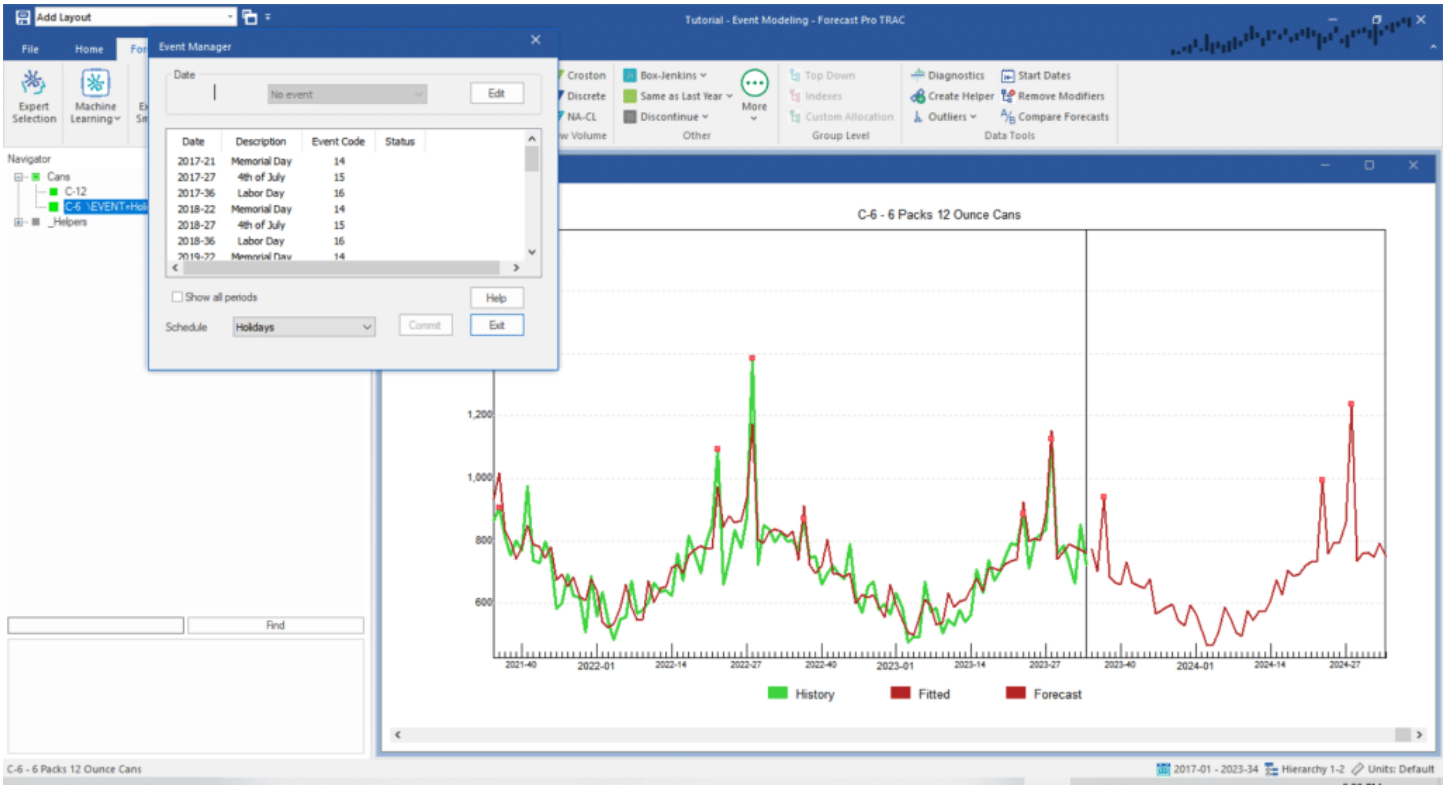
in week 28 in 2020 and thereafter. The fitted values for week 27 in 2020 and 2021 exhibit strong peaks and “miss” the actual holiday peaks that fell in week 28.

Forecast Pro used a standard Winters model to forecast C-6. This model uses 52 seasonal indexes for the data and does not accommodate the holidays changing weeks from year to year.

Select the **Forecasting** tab. Click the Events icon to open the **Manage Events** dialog box. Use the Schedule drop-down to select the Holidays schedule.

Holidays assigns event codes to each of the summer holidays. The event code “Memorial Day” is assigned to each week containing Memorial Day, the event code “4th of July” for the week containing the 4th of July and the event code “Labor Day” for the week containing Labor Day. Including an event index for each holiday allows us to model the holidays as they move around the calendar. (If we were to model this data as a monthly series, the holidays would not change periods and an event model would not be necessary.)

Click the **Commit** button to build the model.



The model now includes 52 seasonal indexes to capture seasonality and three event indexes to capture the summer holidays. Examine the fit to the holiday weeks and notice that the event model is not “missing” the holidays when they move around the calendar.

Although we would like the seasonal indexes to capture a smooth seasonal pattern in this case they do not. This is because of the high degree of random variation in the data and the complexity of using 52 indexes to model the seasonality.

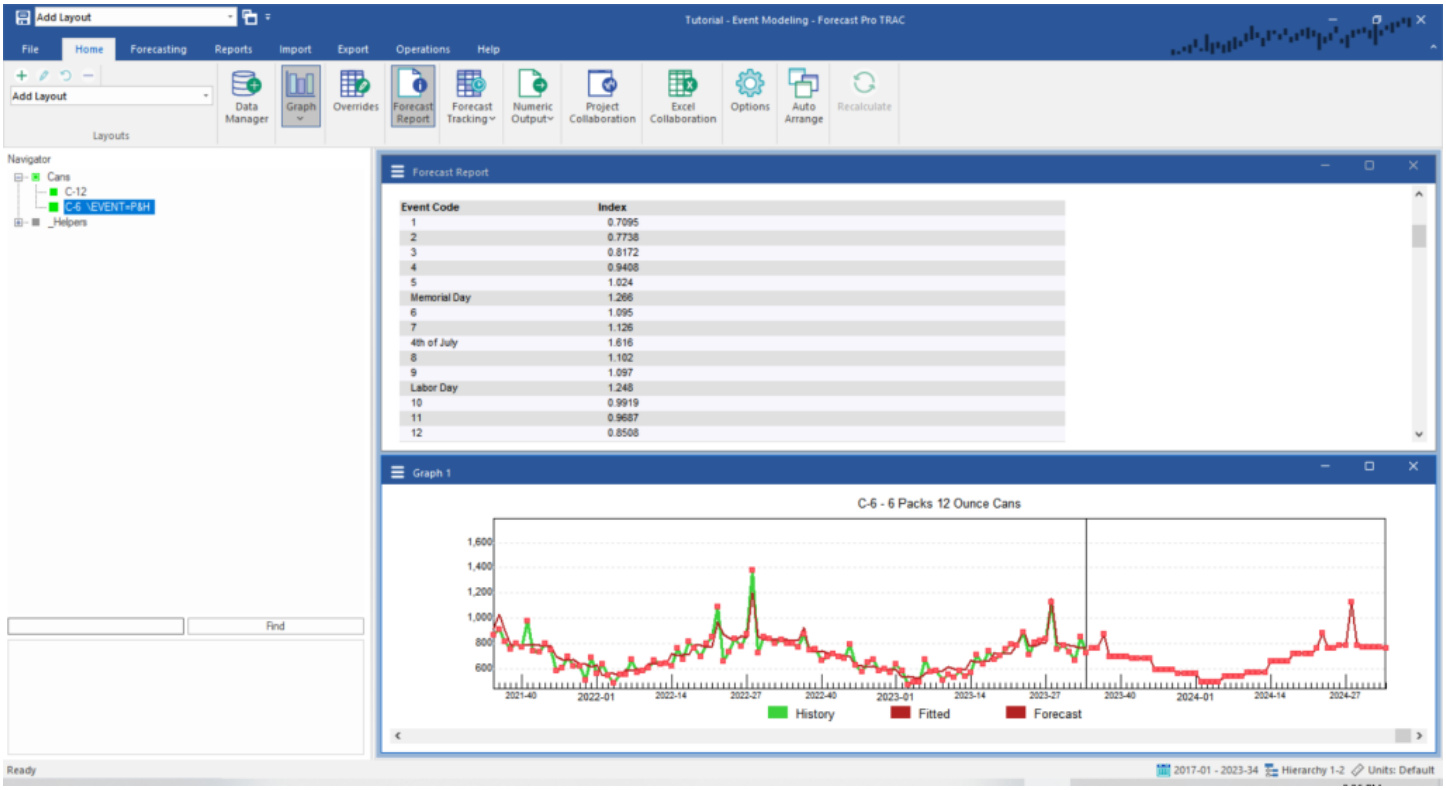
In general, monthly models will more accurately capture seasonality. Nevertheless, many corporations *must* deal with weekly or even more granular seasonal data because production and inventory control require it. Event adjustment models can help you with some of the problems that you will face.

Event models allow you to control how many indexes to include in the model. To illustrate, let's model C-6 using the _P&H event variable.

Use the Schedule drop-down box to select P&H. Notice that P&H maps each week into one of 13 periods (i.e., weeks 1-4 are assigned to Period 1, weeks 5-8 are assigned to Period 2, etc.). The summer holiday weeks (Memorial Day, 4th of July and Labor Day) have their own unique event Codes.

Click the **Ok** button to build the model and exit the manager.

Select the **Home** tab and turn on the Forecast Report view by clicking the Forecast Report icon. Click Auto Arrange to tile the windows. In the Forecast Report, scroll down to view the event indexes. The resulting model uses 16 event indexes—13 to capture the seasonality and three for the summer holidays.



Notice that the forecasts exhibit much smoother seasonality than our previous model. That is because there are now fewer indexes and more historic observations for each index to be estimated.

Exit Forecast Pro.