Teaching With The Forecaster Simulation Revisited

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Mercer University, Stetson School of Business (SSBE), condenses its semesters into two eight-week sessions. As you might imagine, time is at a premium, making it a challenge to cover the requisite operations management material in class. Therefore, I am always on the lookout for exercises that allow me to accomplish several objectives in the same event. The Forecaster Simulation helps me accomplish multiple goals simultaneously by presenting students with multiple scenarios or mini-cases involving demand forecasting. It also helps me introduce students to the LINKS Simulation by way of the Forecaster Simulation.

The Forecaster Simulation is a great exercise for introducing forecasting principles at the beginning of each eight-week session. In the first week of class, students are assigned readings that include industry suggestions for developing demand forecasts as well as reading material from the text. In the second week of class, students come prepared to work in their respective groups during class to develop forecasts for the five Forecaster Simulation scenarios. I prepare the actual data for each scenario ahead of time to speed up the data entry process and make it available to the students before their arrival at the beginning of the second class (Figure 1).

Class begins with a brief review of the basic demand forecasting models, including time-series, causal, and regression models. We also review approaches for determining forecasting accuracy. We then explore the LINKS Simulation interface to familiarize everyone with the simulation inputs as well as the helpful resources. Finally, we begin the Forecaster Simulation exercise. As each team progresses from one scenario to the next, each team's forecast approach and its accuracy for each of the five mini-cases is recorded. When all of the teams have completed the scenarios, I display the compiled results for each scenario so that we can discuss the models as well as the accuracy for each. The students are always surprised by the variation in responses. They also begin to realize that demand forecasting is not just a simple math problem to be solved.

One of several unintended consequences of using the Forecaster Simulation is the early introduction of the LINKS environment. Many of my students request a practice run before the LINKS begins. They are convinced that the only way they can perform well is to experience at least one "practice" round to "figure out how the game works". There are numerous arguments as to why a practice run is necessary but ultimately it boils down to one central theme – fear of the unknown.

Another unintended consequence, and maybe one of the more important ones from a forecasting perspective, is that the students begin to realize that forecasting is neither simple nor perfect. The students are beginning to develop a sense of forecasting by doing. LINKS reinforces that idea.

Forecaster Simulation Exercise Results

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Problem 1

	Method	Accuracy				
		Forecaster Simulation Score			Average	Benchmark
		Year 4	Year 5	Year 6		
Firm 1	Simple Regression	90.2%	54.7%	3.8%	49.6%	65.2%
Firm 3	Weighted moving average	74.3%	50.5%	92.3%	82.4%	65.2%
Firm 4	Moving average	59.6%	73.4%	86.0%	73.0%	65.3%
Firm 5	Guess	96.9%	83.8%	49.9%	76.9%	65.2%
Firm 6	Linear regression	89.9%	54.7%	4.2%	49.6%	65.2%

Problem 2

	Method	Accuracy			
		Forecaster Simulation Score		Average	Benchmark
		Quarter 1	Quarter 2		
Firm 1	Weighted Moving Average	95.8%	93.2%	94.5%	84.6%
Firm 3	Linear Regression	94.7%	97.3%	96.0%	84.6%
Firm 4	Moving Average	78.7%	83.5%	81.1%	84.6%
Firm 5	Guess	86.0%	98.7%	92.4%	84.6%
Firm 6	Moving average	74.1%	80.3%	77.2%	84.6%
Firm 7					

Problem 3

	Method	Accuracy							
		Forecaster Simulation Score						Average	Benchmark
		January	February	March	April	May	June		
Firm 1	Seasonality w/weighted moving average	98.3%	97.0%	81.0%	83.5%	94.9%	74.2%	**88.2%**	77.5%
Firm 3	Weighted moving average	94.8%	99.6%	83.8%	86.3%	91.2%	69.8%	87.6%	77.5%
Firm 4	Moving average	94.8%	99.6%	83.8%	86.3%	91.2%	69.8%	87.6%	77.5%
Firm 5	Guess	99.8%	87.9%	86.2%	97.6%	86.9%	79.6%	89.7%	77.5%
Firm 6	Moving average	94.8%	99.7%	83.8%	96.3%	91.3%	69.9%	87.6%	77.5%

Problem 4

	Method	Accuracy			
		Forecaster Simulation Score		Average	Benchmark
		Product 1	Product 2		
Firm 1	Averaged months 3 & 4	85.5%	85.5%	71.8%	61.1%
Firm 3	Moving average and Compared Differences	85.5%	58.1%	71.8%	61.1%
Firm 4	Moving average	85.5%	58.1%	71.8%	61.1%
Firm 5	Guess	31.1%	50.4%	40.8%	61.1%
Firm 6	Exponential Smoothing	83.4%	83.2%	83.3%	61.1%

Problem 5

	Method	Accuracy	
		Forecaster Simulation Score	Benchmark
Firm 1	Forecasted the remaining inventory at the end of each month using a regression model. Used that to determine the sales in each month. We then projected the month 9 sales using a weighted moving average to determine the order value needed for month 9.	78.2%	71.8%
Firm 3	Linear regression	50.2%	71.8%
Firm 4	Moving average	93.0%	71.8%
Firm 5	Guess	68.1%	71.8%
Firm 6	Weighted moving average	60.3%	71.8%