

How to Predict Future Occupancy

By Howard Hammerman

When demographers make predictions about population growth they examine trends by age and race. They have found that birth rate varies significantly by these factors. By applying age and race specific birth rates to the current population of age and race totals, their final projections are often very close to the actual numbers that are achieved.

The hotel and resort industry has found that market segment, reservation source and prior stays are good predictors of future occupancy. I have devised a method that uses these factors along with historical trends to produce accurate future occupancy predictions quickly and easily. This paper described the method using only market segment. The same concepts could be used with additional predictors to get even more accurate results.

I will use the example a fictional hotel with 140 rooms. The forecasted month is March, 2012. I call this the “target” month. The current date is November 30, 2011. I call this the “as of” date. For simplicity’s sake, we will assume that the hotel has only two markets: FIT and Group. As of November 30, 2011 the hotel had the following on-the-books (OTB) reservations for the target month:

FIT	1,500 room nights
Group	500 room nights
Total	2,000 equal to 46% occupancy

The following table shows OTB and final occupancy figures for the past five years. The right-most column, the rent-up ratio, is simply the final occupancy divided by the OTB reservations as of a given date -- in this case November 30 of each year.

OTB and Final Occupancy for FIT for March as of Nov 30

Year	OTB Nov 30	Final For March	Rent Up Ratio
2007	1,600	2,990	1.8688
2008	1,460	2,700	1.8493
2009	1,940	2,960	1.5258
2010	1,100	2,110	1.9192
2011	900	2,520	2.8000
Averages	1,400	2,656	1.8971

Scanning these numbers we see that the FIT market was definitely affected by the recession. Occupancy bottomed out in 2010 while the rent up ratio bottomed out in 2009. Both numbers have recovered. Rents up ratios were higher in 2011 than in any of the previous four years. This reflects the growing trend for guests to book their rooms closer to their arrival date.

OTB and Final Occupancy for Groups for March as of Nov 30

Year	OTB Nov 30	Final For March	Rent Up Ratio
2007	500	560	1.1200
2008	780	850	1.0897
2009	550	570	1.0364
2010	420	460	1.0952
2011	380	360	0.9474
Averages	526	560	1.0646

The trend for groups is more stable. For each of the five years under examination, by the end of November more than 90 percent of the reservations that would ever take place had already happened. Note that it is even possible for the number of realized reservations to be less than the current OTB number as a result of cancellations. This is shown for 2011.

The following table applies the average ratios shown above to the current OTB numbers and forecasts occupancy four months in advance:

Predicted Occupancy for Mach, 2012

Market	Current OTB	Ratio	Forecast	Occupancy
FIT	1,500	1.8971	2,845	
Group	500	1.0646	532	
Total	2,000		3,377	78%

Using this method I can predict a total of 3,377 occupied room nights in March. This is not as high as some of the past years but higher than the last two years.

All the required numbers for this analysis can be generated from the HOST PMS. You get them by running the various statistical reports and then copying the needed numbers into a spreadsheet. The remaining calculations are easily done within Excel. Or you can use the OccTrack program created by Hammerman Associates that generates the needed numbers, ratios and calculations for you with little more than a single click of a mouse button.

The HOST 4CP report also provides projections. And, by selecting markets you can get the projections for a given market. However, the HOST report simply uses the previous year's rent up ratio and applies it to the current OTB numbers. This is what the projections would look like if one took this simplistic approach:

Predicted Occupancy for March using the HOST Method

Market	Current OTB	Ratio	Forecast	Occupancy
FIT	1,500	2.8000	4,200	
Group	500	0.9474	474	
Total	2,000		4,674	108%

The HOST method drastically over-estimates FIT and slightly under-estimates group occupancy. The predicted occupancy is 30 percentage points higher than the number arrived at using my more conservative method. And the predicted occupancy is obviously impossible since it is over 100 percent. Even limiting the projection to 100 percent produces incorrect results.

By using the average rent up ratio over a period of years, the method I described dampens the wide swings that are the result of year to year variations. At the same it bases the projections on the performance of members of sub-groups with similar characteristics (in this case markets), who, theoretically will continue to act alike in the future. As a consequence, this method gets better results.