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# Forecasting the (Revenue) Future

*Airlines can forecast revenues with considerable accuracy to help make timely corrective marketing actions and enhance cash management.*

■ By Peter Berdy and Ana Maria Escobar | *Ascend* Contributors

Now more than ever, banks, lenders, shareholders and other stakeholders are eager to find answers about the future state of airline finances — just like executives who run the airlines. Prior to dramatic swings in the oil market, management had been able to predict costs within a fair amount of accuracy. However, that capability has rarely been the case for revenues, especially passenger revenue.

Yet, airlines have the capability to forecast revenues with accuracy by using revenue management techniques to successfully forecast, track and calibrate close-in passenger revenues covering a future period of approximately three months, which is the crucial timeframe for taking fare, sales and marketing actions.

The capability to accurately forecast close-in revenue enables airlines to get advance notice to see if they are tracking to their revenue plan, and the information can be used to take timely corrective marketing actions as well as for cash management.

## Methodology to Project Revenue

Typically, an airline's revenue management team is equipped with data and tools to get specific and important tasks completed: setting the proper inventory levels (booking classes) to optimize passenger revenue and establishing overbooking levels. This work is conducted by a staff of trained analysts who are focused on setting detailed inventory and overbooking levels as a matter of their day-to-day job responsibilities.

By using all three components — data, tools and a trained team — an airline has the resources necessary to develop accurate forecasting for passenger revenue for the near term.

## Data

The data itself is of key importance. There are two data sources that are often readily available at an airline and can be used for forecasting revenue. They are passenger booking data and ticket control number data, which includes the fare value.

Booking data, which is updated con-

stantly, is used to calibrate and initialize the revenue management tool and as an input for forecasting demand. In the revenue management system, this data usually gets cleansed to remove outliers and any unusual activity. The revenue management tool also requires fare data for the discount allocation process. Depending on the system and airline, fare data used for the revenue management system can be taken from several sources, such as historical data, published fares, weighted average fare by booking class, and origin and destination. Therefore, it may not reflect the actual fare paid by the customer.

TCN, which contains a lot of valuable data and is usually current, is the second data source. It contains both passenger counts and fares for ticketed passengers. TCN data comprises information from tickets that have been issued for use during future travel periods. It can also be used to estimate the final average fare for a future period. This estimated average final fare combined with the passenger demand forecast from the revenue management system will result in forecast revenues.

To estimate the final average fare for a future period, it is necessary to create a reference fare curve using historical TCN data. This curve is used to establish the change that takes place in the average fare over time; the curve uses the historical relationship of the average fare for tickets sold prior to a baseline period and compares it with the final average fare in the same baseline period.

By using this curve, the historical fare variation can be applied for future months and assumes they will display similar behavior as in the past. The methodology takes the current snapshot of the TCN average fare and applies the factor from the average fare curve based on the number of days to the final forecast period.

A key factor to consider, however, is that TCN does not include data from certain distribution channels. Also, for groups and wholesale travel, fares on the ticket are bulk fares, which are different than the actual net fare received by the company. Therefore, some TCN data needs to be matched to the net fare through

special tables that link the fare basis code to the net fare value.

To correct these imperfections and use the data for forecasting, TCN needs to be compared with historical revenue accounting data to establish a relationship and create adjustment factors at different levels of detail depending on the forecasting need. TCN also needs to be adjusted for known pricing activity that may occur during the period of the future forecast.

## Tools

Revenue management tools, such as the systems within the *Sabre® AirMax® Revenue Management Suite*, contain powerful software used for maximizing total revenue by setting inventory controls at a defined level — flight, departure date, cabin and booking class. The forecast and optimization can be completed by leg, segment, or origin and destination level. The tools require calibration, including identifying and setting parameters, such as season assignments and calendars, to ensure quality data is used and accurate fares are properly fed into the system.

Each revenue management system uses different statistical models to forecast demand. For flights with similar behavior, models create a correlation between time and the booking process. The booking activity for future flights is then combined with the models to predict the final demand.

Typically, the forecast demand is only used to establish inventory levels by booking class and overbooking levels. Revenue management tools have not been used to forecast revenues for airlines. However, airlines can readily use the output from revenue management systems to forecast passengers, which, when linked to a good fare source, can produce an accurate revenue forecast.

Like all forecasting models, the output from revenue management systems will contain errors, presenting the need for the tool to be adjusted and benchmarked against recent historical information. The error will be larger when using the forecast at a detailed level,



such as by flight, by day. The error will be smaller when there is a group of flights or at an entity level with a large group of similar flights. The measurement of this error enables airlines to adjust the forecast provided by the tool and more accurately estimate passenger demand.

**Trained Staff**

Application of analytical skills is the final and most important aspect of forecasting passenger revenue. Trained revenue management analysts know what is going on in their assigned markets or region. In addition, they develop a good feel for trends and usually refine their skills over time.

ically composed of like markets that are grouped together, such as those in a similar geographical region or those that share common passenger characteristics such as discretionary markets.

Airlines can also validate the revenue forecast by using adjusted TCN data containing passengers and fares. The validation data is grouped by entity and is used to create two reference curves — a historical passenger curve and a historical average fare curve. The creation and use of the passenger curve is similar to the average fare curve. The actual average fare and ticketed passengers from TCN are compared with the historical curves as an

should be objective so errors, issues or items that are discovered can be freely discussed and reviewed internally before presenting it to executives. The internal review of the forecast should include pricing and revenue management personnel as well as members of the airline's sales team. Topics of discussion during the internal meeting will likely cover changes in consumer and competitor behavior and possible reasons to explain changes in the forecast.

For the executive review, there should be a hierarchical process that analyzes the monthly revenue forecast on a system level, then on an entity basis and more rarely on a market level. The review should include a comparison to the prior week's estimates to see how the forecast is changing, explaining variations between estimates.

Often, the weekly forecast is benchmarked against a baseline, such as the airline's monthly revenue budget. A simple spreadsheet can be used to show the latest forecast results and maintain a running history. The executive review also needs to be conducted in an open-minded discussion as a process of discovery as new activities unfold in the airline's business.

The weekly update should point out several factors, including demonstrations that the level of accuracy is within acceptable tolerance levels. As the weekly review process continues, it will become more accurate and is likely to be relied on with consistency.

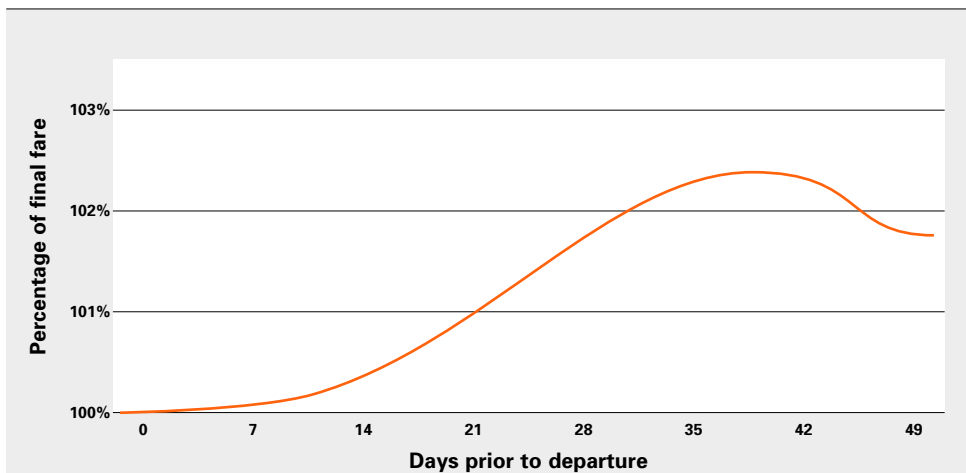
When the revenue forecast flashes signs indicating changing conditions, whether these are based on seasonality, economic events or market action by the airline or its competitors, airlines can be prepared to respond. The forecast can also be used as an indicator to signal possible needs for fare and sales actions, and it can also be used to track results of these activities.

In addition, the revenue forecast can be expected to change as it is being tracked over time. This does not mean original estimates were incorrect; there may be good reasons why the revenue estimate has changed, such as fare sales and competitive actions that cannot be foreseen. The key is to provide an accurate revenue estimate and accompany it with explanations of the variance. Simply put, if it can be measured, it can be managed.

Utilizing forecasts should provide a good early warning system. The forecast can provide insights and can be used as a guide for decisions affecting revenue. **E**

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**Average Fare Curve**



**Specific adjustment factors are used to develop the final revenue forecast. Assuming the fare 30 days before departure is US\$200, the estimated average fare will be US\$196 (US\$200/1.02). This curve will vary by market and season.**

There are certain market facts that a revenue management tool does not recognize since it works with historical data. Some examples include a new entrant, recent fare sales or special events that did not occur in the past. The analyst adjusts the demand to establish the proper booking class levels for that specific occasion. Frequently, analyst adjustments are based on market knowledge rather than on numerical data or statistics.

When analysts adjust demand, they are also modifying the output of the system. This is an important element since the output is used to forecast the revenue of the company. By using well-trained and focused analysts, the forecast should contain greater accuracy.

**Validating the Revenue Estimate**

Using revenue management systems to forecast passengers by market, combined with adjusted TCN fares by market, will provide a total passenger revenue estimate. The revenue forecast can be grouped into different levels, such as an entity basis. An entity is typ-

ically composed of like markets that are grouped together, such as those in a similar geographical region or those that share common passenger characteristics such as discretionary markets.

adjustment to estimate final passenger revenue; the validation process does not use the revenue management forecast demand but instead uses TCN data to forecast passengers. These two forecasts produce separate results on different levels (by segment from the revenue management tool and by entity using TCN), and they can be prepared rapidly. If the comparison of the detailed forecast produced by the revenue management tool and the validation forecast are similar, the forecast should be reasonably accurate. Comparing the forecasts will point out differences that can be adjusted to get weekly forecast consistency.

**Using the Revenue Forecast**

Once committed to the revenue forecasting process, which should be updated weekly, airlines can use it as a tool to measure and manage the business as well as a source to provide information to the board of directors, investors and lenders.

A process needs to be in place that measures the quality of the forecast. This process