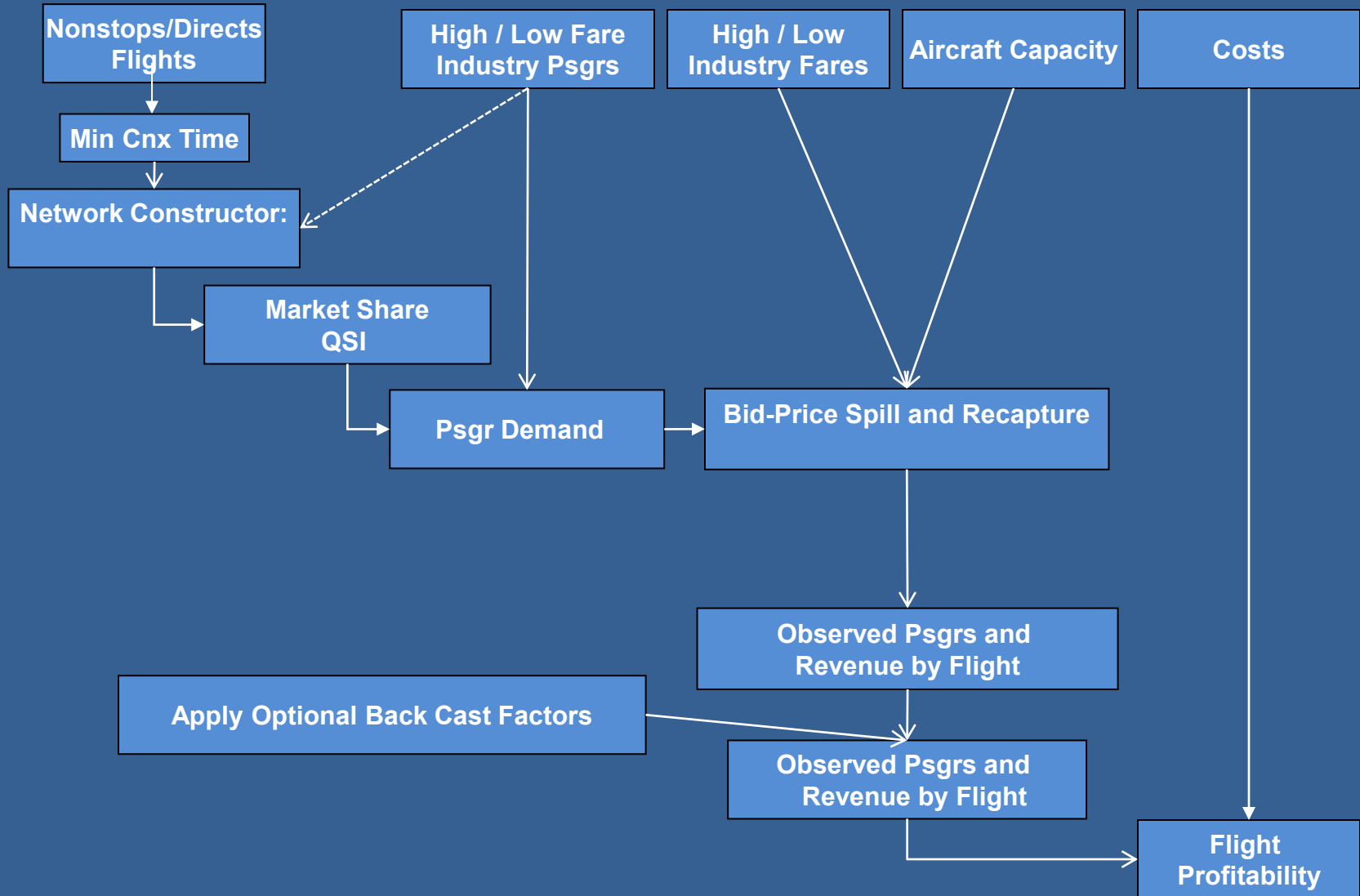


Why We Forecast

- We forecast to understand the revenue and profit changes based on such events as:
 - Mergers
 - Code Shares
 - Costs
 - OA schedule change
 - Economic change
 - Aircraft acquisitions and retirements
 - Schedule structure

Forecast Process



Document Overview

- Included in the Process section
 - Network Constructor
 - Market Share / Quality of Service Index (QSI)
 - Spill and Recapture
 - Bid Price Spill
 - Iterative and Exhaustive recapture
 - Revenue Proration
 - Apply Back Cast Factors (BCF)
 - Costs
- For a more detailed review
 - Spill and Recapture and Costs have their own sections
 - Network Constructor and QSI are in the deep dive sections

Network Constructor

Network Constructor Inputs

- Schedule: non-stops and direct (same flight) service
 - Code Share flights
- Minimum Connect Time
- Maximum Connect Time
- U.S. Preclearance Time
 - U.S. Customs is done at select foreign airports
- Fare availability by Origin and Destination (O&D)

Network Constructor

- Combines non-stop and direct flights to build online and interline connections
 - Connections must meet minimum passenger connect times and maximum passenger connect times
 - Number of connections retained determined by market size
 - Connections ranked on quality - based on stops and online/interline status
 - Pattern of connections governed by rules such as
 - Circuity
 - Minimum number of nonstops to prevent connections
 - Overlapping

Quality of Service Index

Demand Share Calculation

- The Quality-of-Service index (QSI) is used to assign a score to each service in an O&D.
- The scores for all services are summed for the O&D and each service receives a weekly market share equal to its score divided by the O&D total score.

Demand Share Calculation

- QSI includes the following variables:
 - Service type
 - Equipment type
 - Elapsed time penalty
 - Non-stop proximity penalty
 - Time-of-day
 - Airline Preference
 - Route Presence
 - Airport Presence
 - Relative Fare
 - Displacement

QSI Equation



Spill and Recapture

Spill and Recapture

- Spill and recapture estimates the portion of demand that is accommodated on the available seat capacity
 - Passengers are first spilled from O&D services, then reattracted to other services, and finally recaptured on the most attractive and available service
 - Passengers are spilled because of excess demand on a segment, or in the case of flow passengers, because of excess demand on up-line or down-line segments
 - Revenue is optimized in the industry using Bid Price Spill, a spill engine that minimizes spilled revenue
 - Two recapture methods can be used, iterative or exhaustive

Bid Price Spill

Bid Price Spill

- The Bid-Price Spill engine determines bid prices for each leg given capacity constraints, then spills passengers to reach an optimum system revenue solution
 - Bid Price requires a coefficient of variation (CV) to function, either a system average CV or a variable CV calculated for each leg
 - The larger the CV, the more passengers will be spilled (less certainty)

Iterative Recapture

Iterative Recapture

- Spilled passengers are first reaccommodated on their desired flights using the Trapezoidal Rule
 - The result of this step is that as many passengers as possible fly on their preferred flight
- This step may iterate several times
 - In practice, however, few additional passengers are accommodated after the first iteration

Exhaustive Recapture

Re-estimate Demand Based on Availability

- Bid Price Spill has accommodated most high fare passengers on their preferred services, and as many low fare passengers as space allows
- As in the real world, value conscious passengers must move to less attractive services, as evidenced by their availability, to receive the lowest fares
- Exhaustive recapture recalculates demand based on availability, and reaccommodates the mostly low fare demand up to the level predicted by RM's forecasting models

Revenue Proration

Revenue Proration

- O&D revenue is prorated to the flight segments comprising each service
 - Domestic Revenue Prorate: Segments are valued proportionally from a table of target fares constructed by Revenue Management
 - International Revenue Prorate: Segments are valued proportionally from a table of cost and mileage weighted fares constructed by IATA.

Back Cast Factors (BCF)

Description of BCF

- BCF adjusts passengers per flight and revenue per passenger based on one or more months of historical data
 - Period or annual market size and fare files utilize multiple months
- Used as a ‘band-aid’ to eliminate error
 - BCF accuracy for revenue and passengers can exceed 99%

Creation and Application of BCF

- BCF monthly files are created by matching a back-cast to the corresponding actual month's data
 - File contains backcast observed passengers and revenue and actual passengers and revenue by operation
 - Example: Backcast Pax/Flight 120, Actual Pax/Flight 126, BCF 1.05
- BCF's are applied by first matching a forecasted flight to the like flight in the BCF file, then adjusting the forecasting flight by the appropriate passenger and revenue BCF
 - Passengers and revenue are not fixed, by vary with the forecasted observed passengers and revenue
- Multiple months can be weighted by simple average or exponential smoothing
 - Minimum number of matched months is specified, typically 1

Costs

Costs

- Cost information is maintained by the finance department
- Costs are calculated per nonstop operation (LEG) and revenues are calculated on an O&D basis.
- Costs per operation are converted to average day per week to calculate profitability
 - Revenue is “average day” by definition
- Calculation of domestic and international operating costs is based on airport, entity and equipment type
- Cost variables include:
 - Passenger variable costs
 - Fuel (both air and taxi times)
 - Landing fees
 - Variable overhead
 - Fixed overhead
 - Aircraft ownership