

Airport traffic forecasting

The art of predicting the future

It is no secret that in order to succeed in a highly competitive environment such as the aviation market it is necessary to analyze and understand the current market situation as well as foresee potential development scenarios and perform precise risk assessments. But it is extremely difficult to orient in nowadays reality with highly volatile market conditions, which are very sensitive to economic and political situation not just globally but on the domestic market as well.

Besides the external environment, it is also very important to predict future developments such as capacity requirements from the internal point of view. In the case of airports it has to be performed well in advance in order to be able to adjust the infrastructure, which is quite a time-consuming and resource-intensive matter.

Sometimes airports do this job quite well themselves but more often they fall into the trap of their own subjective opinion and niche market understanding, which in the best-case scenario only limits their future opportunities. For this particular reason, credit and financial organizations or other potential investors demand an independent opinion from a third party.

So there is no doubt that development of a trustworthy traffic forecast based on reliable and solid data and a deep understanding of the particular market and industry as a whole is the crucial issue and should not be underestimated.

As a part of the world's biggest aviation consortium, Lufthansa Consulting has extensive experience in performing market potential analyses, creating air traffic forecasts and foreseeing air service developments. In order to elaborate airport traffic forecasts it uses well-proven methodology, which consists of four steps:

1. Data collection and traffic segmentation
2. Organic growth forecast (correlated to GDP traffic)
3. Non-organic factors that impact estimates (not related to economic situation)
4. Crisis pattern amendments (if applicable)

During the very first step of the process, all the necessary data is collected and proper segmentation is performed. Unfortunately, it is common practice among airports, even the larger ones, to underestimate the importance of the proper collection and analysis of historical data. This can lead to a misunderstanding of the current situation and cannot therefore form a reliable basis for a forecast.

As a second step, an organic growth forecast is developed. The correlation between traffic growth and growth in GRP (i.e. growth in the region of the airport) and GDP (growth in the country as a whole) is demonstrated statistically and is used to extrapolate air traffic growth of the airport in the future.

The GDP forecast is provided by multiple trusted sources including international and local organizations, state authorities, rating agencies, research institutions, commercial and investment banks. The data is then calibrated with corresponding weights and reference values in order to obtain a widely acceptable forecast for a future period. The resulting growth forecast is a combination of the intermediate forecast and the GDP growth forecast, which in some cases is calibrated for the country. Micro- and macro-levels considering saturation effects can be based on average regional or country growth rates and/or the expected level of population mobility in order to even out possible regional deviations from the trend.

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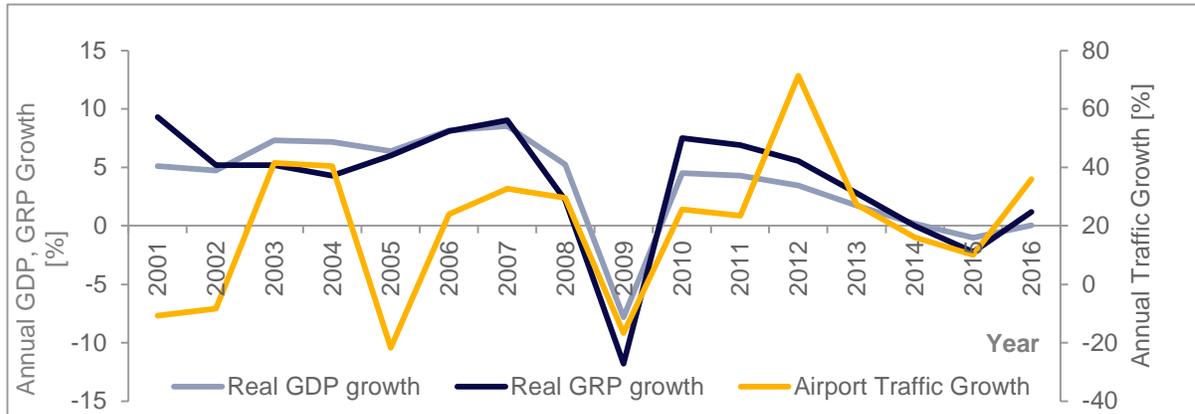


Figure 1: Historic growth rates of GDP, GRP and passenger traffic

Non-organic factors are applied to the organic growth rates in order to fine-tune traffic volume in accordance with factors unrelated to the economy such as technology and nature-related shocks, political crises, mass events, etc.

Three types of non-organic factors are taken into account in Lufthansa Consulting forecasts:

- non-recurrent factors: one-off events that influence traffic for a very limited period of time, e.g. a FIFA championship
- mid-term influencing factors: a group of factors that impact traffic for a longer period of time, e.g. runway refurbishment
- so called “shifting” factors: these factors lift traffic up or down at the moment of occurrence in order to adjust traffic to the “new reality” (e.g. liberalization, subsidies, etc.)

After adjusting the forecast to take account of non-organic factors, “crisis patterns” are applied, if necessary, to estimate the intensity of an industry crisis, its duration and recovery period.

An individual crisis pattern, based on the experience of previous crises, is modeled for each traffic segment and complemented traffic growth produced by the correlation with economic growth. Crisis patterns are characterized by the depth (h) and speed (v) of decline, crisis duration (d), recovery period duration (ℓ) and speed before crisis (α) with deviation (δ). In addition, recovery is normally accompanied by accelerated growth, for example, as shown in Figure 2, the recovery of the airport traffic after financial crisis one year delayed from the economy.

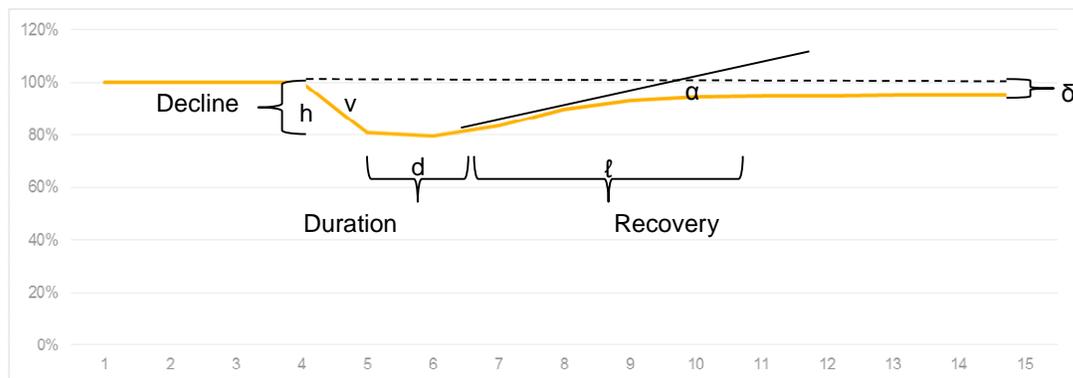


Figure 2: Example of a crisis pattern

The resulting traffic forecast is usually split into three possible scenarios: optimistic, pessimistic and the most likely scenario split into traffic segments in order to provide the highest level of forecast authenticity. Each scenario has its own GDP forecast, as well as a set of non-organic factors and crisis patterns.