FORECAST

Methodology

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What is a forecast?

A forecast is **an estimate of future market developments**, over a given period, using statistical methods. Upply's forecast allows us to obtain forecasts of transport price trends **over a 6-week period**.

The forecasts made by Upply are based on a set of information available to date. To produce its indices, Upply has **data on the monthly or weekly evolution** of transport prices for a given mode (road, sea, air).

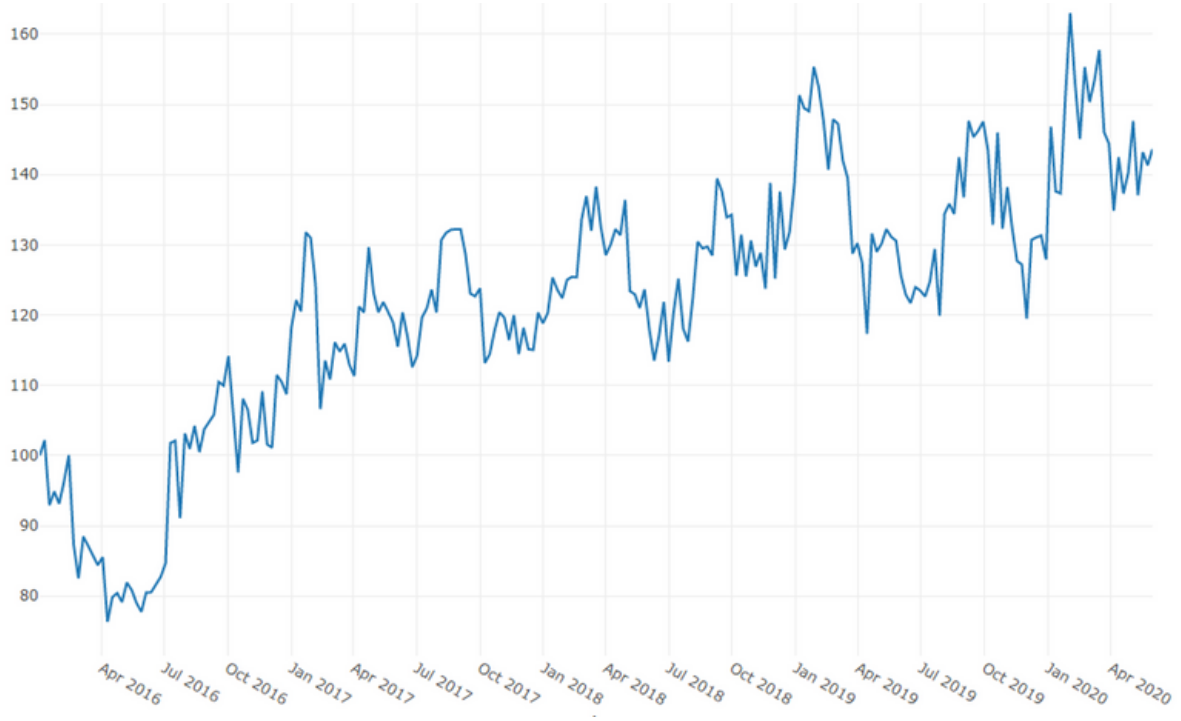
In the light of past trends, Upply identifies recurring trends that may be expected to recur in the future: short and medium term movements, seasonality, etc.

However, some events remain particularly unpredictable: political decisions, economic shocks or health crises.

Definition of a time series

A time series is a **series of observations repeated over time, at different and usually equidistant dates** (daily, monthly, quarterly or annual observations). A time series is often represented by a graph where the abscissa corresponds to the dates and the ordinate to the observed values.

Time series are used in many areas: meteorology, demography, economics, biology, etc.

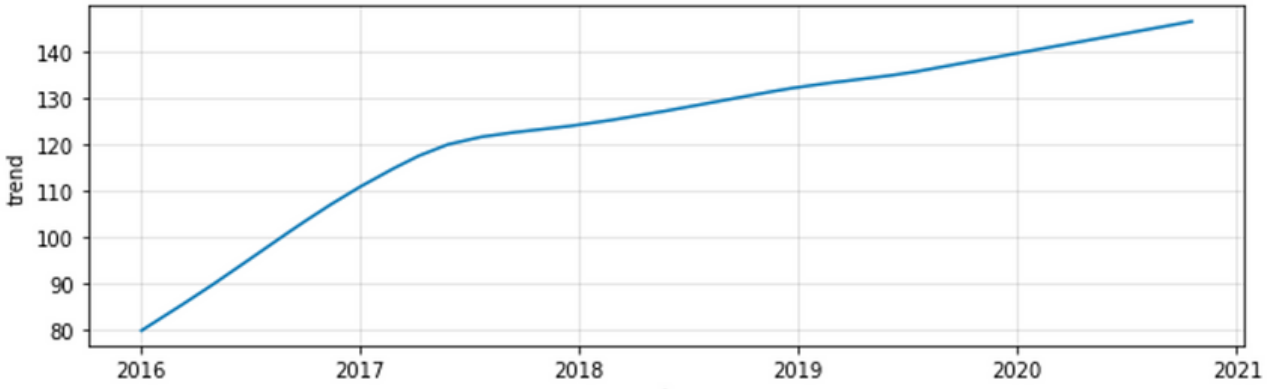


Here is one of our weekly indices on the evolution of shipping prices between Asia and Europe from 2016 to 2020.

- On the x-axis: one date per week.
- On the vertical axis: the AS-EU shipping price index, base 100.

Searching for a trend

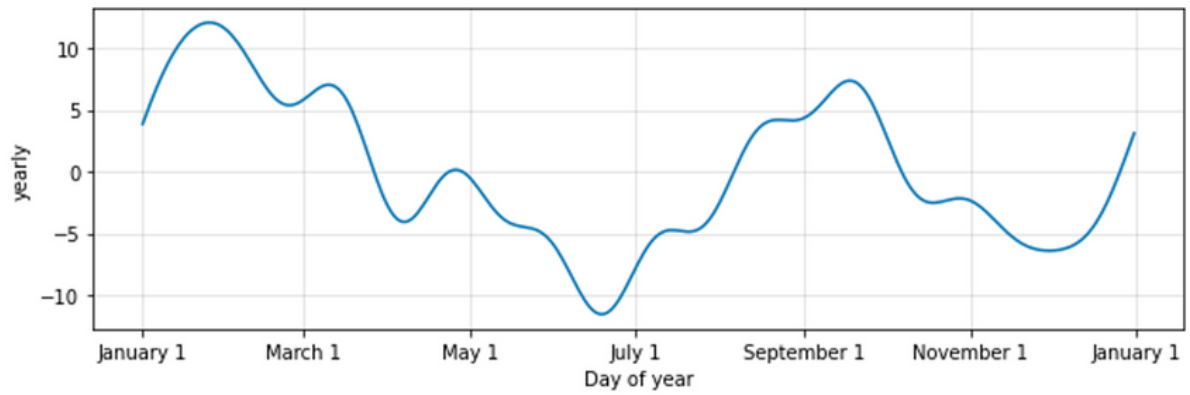
- The first step is to understand the overall trend of the time series, i.e. the long-term trend.



- In the example above, an overall upward trend is apparent since January 2016. However, there are two stages: a significant increase from 2016 to mid-2017, and then a less dramatic increase until 2020.

Searching for seasonality

In time series data, seasonality refers to **variations that recur at specific regular intervals of less than a year** (monthly or quarterly observation). In freight transport, **seasonality can be caused by various factors**: holidays, public holidays and peak periods of activity such as before the Chinese New Year in shipping, or before the end of year holidays.



In our example above, we recognize **the low season, which is between March and June, and the high season, which is between August and October** (corresponding to the period before the end-of-year holidays, when stocks are built up).

Irregular and random component

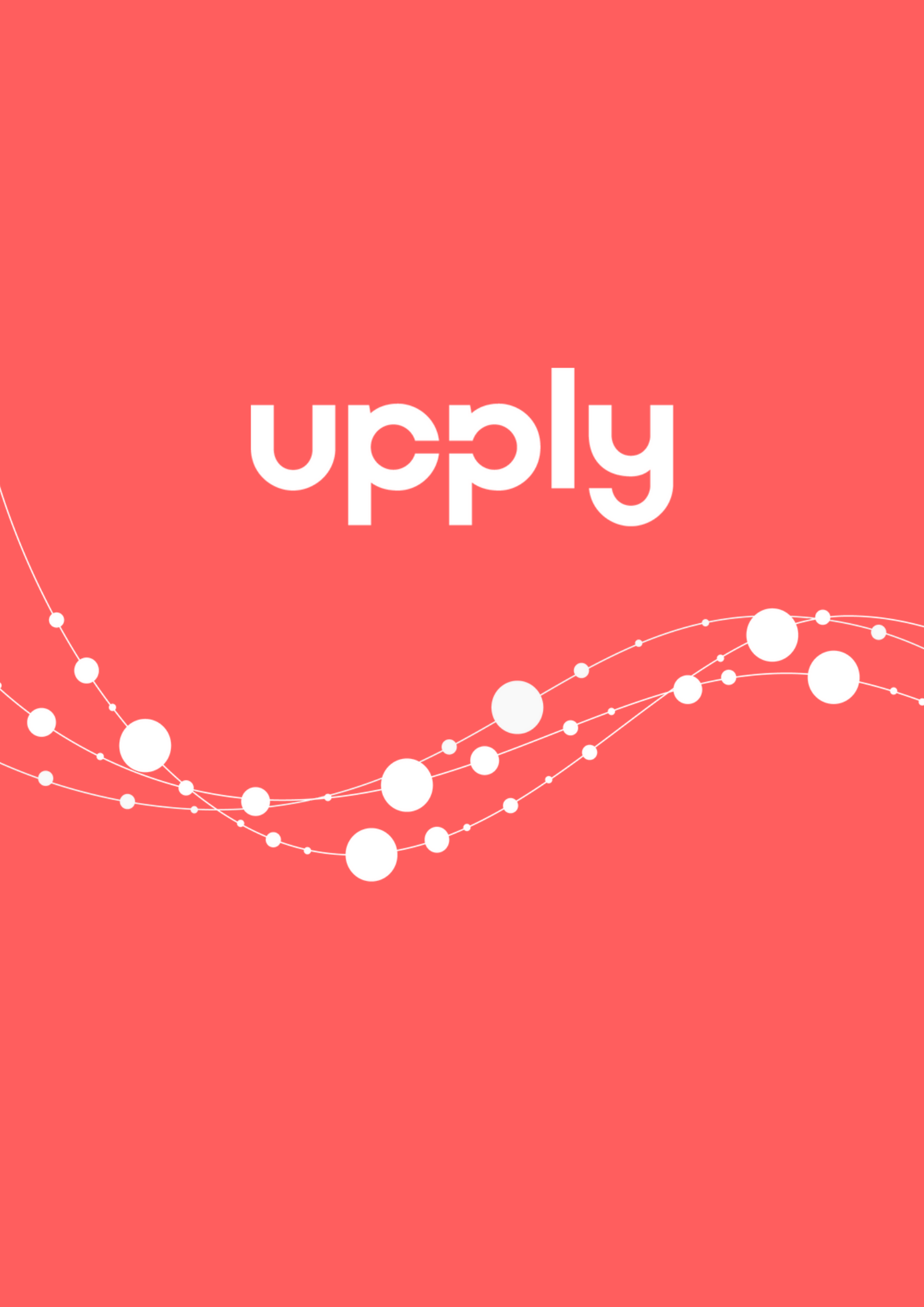
A time series cannot be fully broken down into a trend and seasonality alone. There is always **an element of randomness called the residual.** In theory, this residual should not change over time. **There are statistical techniques to try to explain the residual and thus be able to predict it in the future**.

Validation of the algorithm

Once our algorithm is built, we can evaluate its performance **on past data using a performance indicator**. We compare the forecast prediction with the reality and see if the two are far apart.

The limits of forecasting

Some events are particularly difficult to foretell: political decisions, economic shocks or health crises. **Forecasts are always uncertain and long-term trend changes are difficult to predict.**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