



QYOBO predicts API price increase 60 days in the future

Find out how our AI price forecast helped a European generics company lock in prices 11.5% below the market rate

Background

Accord Healthcare, one of Europe's fastest growing pharmaceutical companies – active in 85 markets around the globe – has been one of the earliest adopters of the QYOBO platform. Already in early 2020, Tony Watson (Director of Procurement) and Matthew Holt (Third Party Procurement Manager) introduced the platform in their organization.

Among other use cases, such as identifying reliable sources to boost its supply chain

resilience, the team at Accord uses the QYOBO platform to continuously monitor market prices and price trends for the raw materials used in their drug manufacturing facilities. A key focus thereby lies on “active pharmaceutical ingredients” (APIs) such as Paracetamol or Atorvastatin calcium to ensure the company is maintaining a competitive level of cost of goods.

Case study

In June 2022, QYOBO AI price forecast indicated a strong price increase for Atorvastatin calcium, one of Accord’s key products (see figure 1).

As many other “statins” (also known as cardiovascular drugs), Atorvastatin has seen a sharp price decrease over the past years - with average market rates dropping from around 296 USD/kg in Q4/2017 down to 199 USD/kg in Q2/2022. This development can be mainly attribute

to an increasing number of internationally active manufacturers - which increased to 41 in 2022 up from 36 in 2017 (and 10x more than the just 4 manufacturers in 2005).

Considering the historic trend, it would have been natural to assume further price decreases – in contrast, **the QYOBO AI forecast indicated a substantial increase by August/September this year.**



Figure 1: Market average price for Atorvastatin calcium (top) QYOBO platform on June 22, 2022. The dotted line indicates the forecast, and the shaded area the 95% confidence interval. (bottom) QYOBO platform on November 8, 2022: The shaded area highlights the previous forecast interval now with a solid line indicating the actual values in that timeframe.

The early warning on the imminent price increase provided to Accord and other QYOBO clients was further complemented by synthesis insights: The QYOBO platform contains over 8,000 relations between APIs and the substances used to manufacture them - so called key starting materials (KSMs aka intermediates).

Based on these relations, clients can easily analyze the market data for KSMs and compare the price

trends of an API against its KSMs. It was obvious that **while the API price had continued to decrease, prices for three of the most commonly used KSMs such as KSM 2² had stabilized** and turned into a slight upward trend between the first and second quarter of 2022 (see figure 2). The resulting decrease in gross margins for API manufacturers producing Atorvastatin made higher API prices in the long run ever more likely.

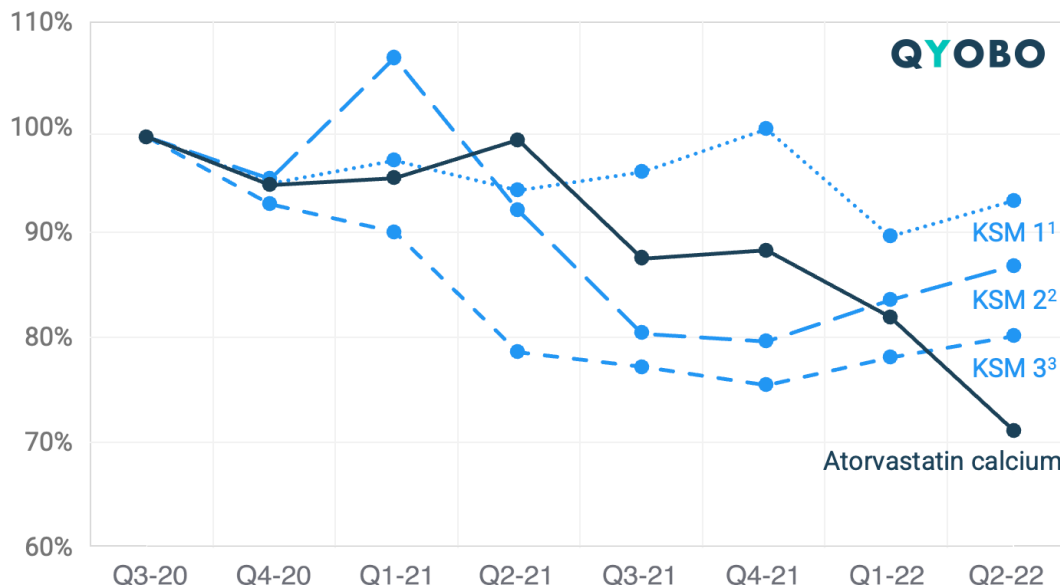


Figure 2: Market average price for Atorvastatin calcium and its key starting materials (KSMs) by quarter as seen on the QYOBO platform on June 22, 2022. The dark blue line indicates the average prices for Atorvastatin calcium while the blue line indicates the three KSMs.

Results

Using the AI price forecast for Atorvastatin calcium and the insights on its key starting materials, Accord Healthcare negotiated a fixed API price for the next two years with its supplier. In November 2022, average prices for Atorvastatin had passed

a level of 230 USD/kg mark, leaving Accord with **more than 11 percent savings versus the market average price, equivalent to more than 50,000 USD savings per year.**

¹ KSM 1 refers to Atorvastatin calcium intermediate I1, CAS 125971-95-1

² KSM 2 refers to ATS-8 or (4R,6R)-tert-butyl-6-(2-aminoethyl)-2,2-dimethyl-1,3-dioxane-4-acetate, CAS 125971-94-0

³ KSM 3 refers to (4r,cis)-1,1-dimethylethyl-6-aminoethyl-2,2-dimethyl-1,3-dioxane-4-acetate, CAS 125995-13-3

How does the AI price forecast work?

In technical terms, our forecast model is “univariate time series forecasting”. Simply put, our model analyzes patterns in the price dynamics (“univariate” describing that there is one main attribute used by the model, i.e. the price) using historic data going back until 2015 (the “time series”) for every molecule individually. In detail, it’s actually a bit more complex as the model consists of 6 sub-models - different mathematical frameworks - each of which makes a prediction when new price data is available. Based on the prediction confidence returned by each sub-model after the prediction as well as the historic performance, the best-performing prediction is shared with our clients on the QYOBO platform. The model also improves over time with new data, which also means that the sub-model used to predict the price for a molecule may change over time.

How does QYOBO ensure the forecast is correct?

Utmost quality being one of QYOBO’s core values (our software is #MadeInGermany out of Munich), our model has a built-in validation: Forecasts are only displayed for substances where the model performed well in the past. While this limits the forecast to approx. 25% of all substances available on the QYOBO platform, we believe that this is the right way to go.



QYOBO’s mission is to improve access to essential medication for everyone by contributing to a more transparent, efficient and robust supply of pharmaceutical and chemical raw materials

For this purpose, we’ve developed the QYOBO market analytics platform for APIs, intermediates and chemicals. From millions of trade, regulatory and financial datasets scattered around the world, our big data algorithms derive unique, actionable insights on market prices and trends, suggest suitable partners for your business and automate data-heavy workflows in procurement, supply chain and business development

Founded in June 2019 and based in Munich, our company is pursuing its mission collaboratively with its international clients and has been recognized with numerous awards including the BASF market challenge and the Digital Innovation award 2020 by the German Federal Ministry for Economic Affairs & Energy (BMWi)