



## How to use historical volatility of soybean prices to estimate your cashflows

### Soybean market in the EU

The EU need for soybeans is largely fulfilled with import from the United States, and accounts for 75% of supply. Imports of U.S. soybeans by the European Union increased by 112% over the current market year (July-December 2018), compared to the same period in the previous year.

Currently this amount is about 14 million tonnes of soybeans per year. Soy is used as a source of protein to feed animals, including chicken, pigs and cattle, as well as for milk production.

According to Barchart soybean futures charged out of the weekend to finish Monday 4.0-4.5 cents higher, riding the winter weather rally. Parts of the Dakotas saw up to 2 feet of snow in last week's storm. Soybean meal lost \$0.90/ton, while soy oil closed Monday up 7 points.

As a reminder, ABN AMRO expected a slight decrease in soybean prices for 2019 – see under.

	2nd contract		- end of period prices -								- averages -	
	22.02.19	Q1-19	Q2-19	Q3-19	Q4-19	Q1-20	Q2-20	Q3-20	Q4-20	2019	2020	
Wheat-CBOT (USDc/bu)	492	515	532	543	545	-	-	-	-	532	-	
Corn-CBOT (USDc/bu)	385	389	393	390	400	-	-	-	-	392	-	
Soybeans-CBOT (USDc/bu)	923.75	920	915	895	900	-	-	-	-	909	-	
Sugar (USDc/lb)	13.3	12.85	12.70	12.80	13.00	-	-	-	-	13.00	-	
Cocoa (USD/MT)	2,288	2,350	2,370	2,460	2,475	-	-	-	-	2,462	-	
Coffee-Arabica (USDc/lb)	100	105	109	110	113	-	-	-	-	108	-	

ABN AMRO forecast price trend until 2019 (index)

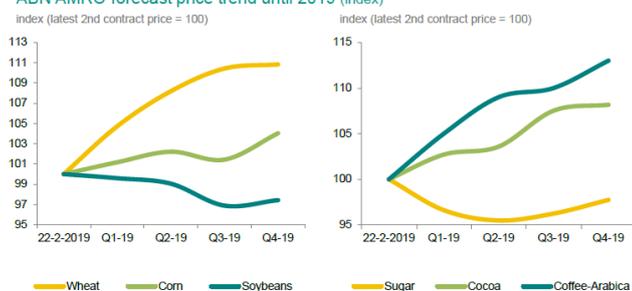


Figure 1 Price development Agri - Source ABN AMRO Feb 2019

Furthermore Barchart stated traders are expecting Tuesday's Crop Progress report to show soybean harvest as of 10/14 at 25-26%, which would be 11% behind last year and 23% behind the average.

A Reuters survey suggests September NOPA crush will be around 162 million bushels. It should be down from

August (168 mbu) due to 1 less processing day and some plant downtime ahead of harvest.

Brazilian planting is 9.5% completed vs. the 5-year average of 12.4%, according to a firm called ARC Mercosul quoted on Eikon.

### Your commodity exposure

The current volatility of soybean prices is appr. 17.5%. Soybean oil is moving around 15% whilst soybean meal is higher, just below 20%. Compared to the Euro Dollar volatility, it is 3-4 times higher. What is the impact of this volatility on your business?

Suppose you consume in 2020 an annual volume of the following basket of soy products:

Commodity	Amount
Soybean meal	12,000 MT
Soybean oil	12,000 MT (= Lbs 26,455,440)
Soybeans	12,000 MT (= Bushel 440,924)
<b>Total</b>	<b>36,000 MT</b>

Your annual cash flow based upon current market prices (prices taken 11<sup>th</sup> October 2019) would be around \$16.3 million.

### What can happen in 2020: "Cashflow-at-Risk"

If you do not hedge this "floating priced" position, your cashflow-at-risk (=CfaR) for 2020 can be presented as the potential cash flow difference between: Volume \* (current market prices versus simulated market prices).

KYOS calculated the current CfaR at \$ 2.6 million.

#### Risk Profile: Soymarket Portfolio 2019-10-11

Earnings at Risk Cash-flow at Risk Volumes at Risk

Cash-flow at Risk Summary	Currency	95% at Risk
Total	USD	2,631,178

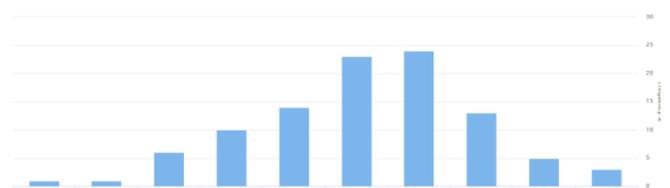


Figure 2 Distribution of cash flows - Source KYOS

## Potential cashflow movements 2020

For your cash flow this means that:

- With 95% certainty your cashflow will be lower than \$ 18.9 million
- Be aware that \$ 18.9 million is not the maximum

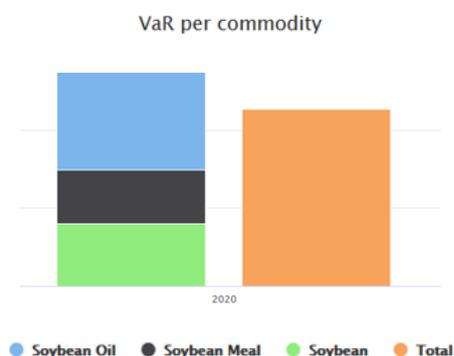
With this information, you are better prepared to make your hedging decisions!

## Short term versus Long term

KYOS software is used globally by procurement teams to calculate short- and long-term risks.

Short term risks can be calculated using stress tests or by using Value@Risk (=VaR) calculations. VaR can be calculated using different modelling techniques and depending on the underlying commodity, clients should apply a different technique.

The graph underneath shows the Value@Risk: left for the individual soybean items (oil, meal and beans), right for all three together. You noticed the difference?



VaR on a portfolio of soy products (beans, oil and meal) is lower than the sum of the individual VaR calculations for soy-beans, -oil and -meal. This makes sense as sometimes soybean oil goes up whilst prices of soybean meal go down and vice versa. So prices of the individual products do not always move in the same direction. This is the portfolio effect and it affects your portfolio risks.

In our example we use the same volume of soy products (12,000MT each for beans, oil and meal). As the price per MT differs, the 2020 cashflows differ as well as soybean meal is more than twice cheaper than soybean oil. But from a risk perspective “volatility” is an important key metric and also the volatility differs between beans, oil and meal.

## What can happen in 1 day: “Value-at-Risk”

For a short-term risk calculation (e.g. 1 day) you can use Value-at-Risk. With 95% certainty the potential cash flow change (up/down) will not be bigger than \$ 226.160 for this portfolio of 36,000MT soybean products.

However, what would be the risk during a 10-day holiday period? For the same portfolio, with 95% certainty, the potential cash flow change (up/down) will not be bigger than \$ 695.390.

## KYOS adds value

To help you understand these price risks and improve your cash flow prediction, KYOS has developed risk management software to effectively manage your commodity portfolio. This software can be tailor-made to reflect your specific requirements. The KYOS commodity portfolio & risk management system captures years of industrial experience in managing budgets, commodity contracts, physical and/or financial hedging, market price analysis including sophisticated cash flow forecasting.

## For whom

Are you still using different spreadsheets to calculate your numbers? Whether you are in Procurement, Sales, Finance or Treasury – every department needs good, dependable figures. We at KYOS are confident a good cash flow forecast will make your life easier. Please do not hesitate to contact us so we can discuss how we can help you save time – and probably money too.

**Interested to learn more? Contact us at [info@kyos.com](mailto:info@kyos.com)**