KYOS Commodity Risk Solutions

Insights in risks

Wheat & Sugar

October 2023

Learn about the risks of a commodity portfolio with KYOS Insight in Risks.

What are the risks you are facing? At KYOS we offer several analytical modules in our platform to optimize your business:

- **Risk reporting**: understanding the current situation
- **Risk analytics**: simulating the future.

In this report we would like to explain two important advanced risk metrics: Cashflow-At-Risk and Value-At-Risk. These are based on market price volatilities, correlations and Monte Carlo simulations,

We will compare two commodities to illustrate the amount at risk, and what measures you could take to mitigate the risk.

Advanced risks metrics offered by KYOS:

- **Stress tests**: how are your financial results if there is a specific change in market prices, volatilities or positions?
- **Options and accumulators**: what are the values of your derivatives, using Monte Carlo simulations?
- **Value-at-Risk:** what is a '95% worst-case' impact on your MtM in one single day?
- **Cashflow-at-Risk / Profit-at-Risk:** what is a '95% worst-case' scenario of your cash-flows over a longer period?

Portfolio example: wheat and sugar

In this example we show a food producer who needs to buy wheat and sugar during the budget year 2024. In the table below we compare the costs to buy this portfolio on the forward market.

		22 Feb 2023		23 Oct 2023	
Commodity	**Exposure**	**Average price**	**Total**	**Average price**	**Total**
Wheat	5 million bushel	788.55 $ cents/bu	USD 39.4 million	644.46 $ cents/bu	USD 32.2 million
Sugar #11	66,138 mio Lbs	18.23 $ cents/ Lbs	USD 12.1 million	25.80 $ cents/ Lbs	USD 17.1 million
Total			**USD 51.5 million**		**USD 49.3 million**

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Cash-flow at Risk

The Cashflow-at-Risk is calculated as a '95% worst-case' scenario of your cash-flows over a longer period. If you do not hedge this "floating priced" position, your Cashflow-at-Risk (=CfaR) from today until 31 December 2024 (=22 months) can be presented as the potential cashflow difference between:

Sourcing volume * current market prices versus

Sourcing volume * simulated market prices

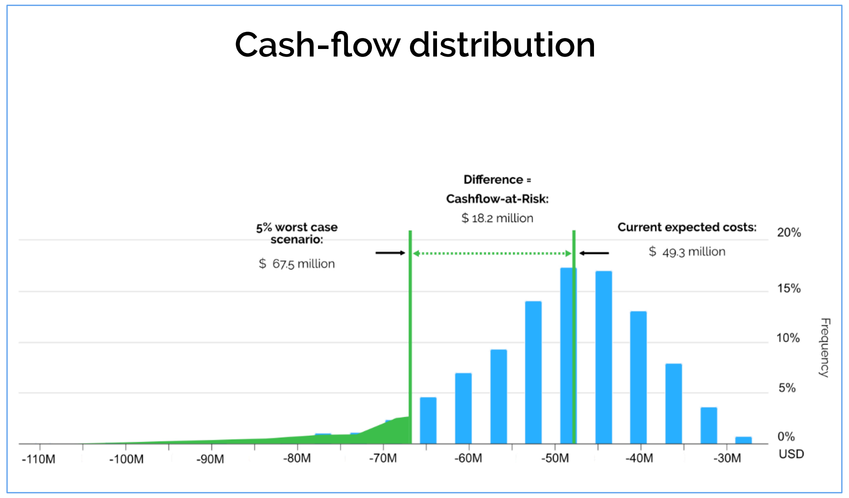
	22 Feb 2023	23 Oct 2023
Current value	USD 51.5 million	USD 49.3 million
5% worst case scenario	USD 84.2 million	USD 67.5 million
Cashflow-at-Risk	USD 84.2 – 51.5 = USD 32.7 million	USD 67.5 – 49.3 = USD 18.2 million

We estimate with 95% confidence that the total costs to source these two commodities will not be more than USD 67.5 million. This means that the difference between the current costs USD 49.3 million and the worst-case costs (67.5) is the CfaR of USD 18.2 million.

To reduce the CfaR, you could use financial instruments like hedging with swaps, futures and/or options. What will you do? Hedge now, at current market prices and pay USD 49.3 million?

Or leave it open? There is a 5% chance that costs will go up and you have to pay an extra USD 18.2 million—or more.

The graph underneath shows the distribution of the CfaR.

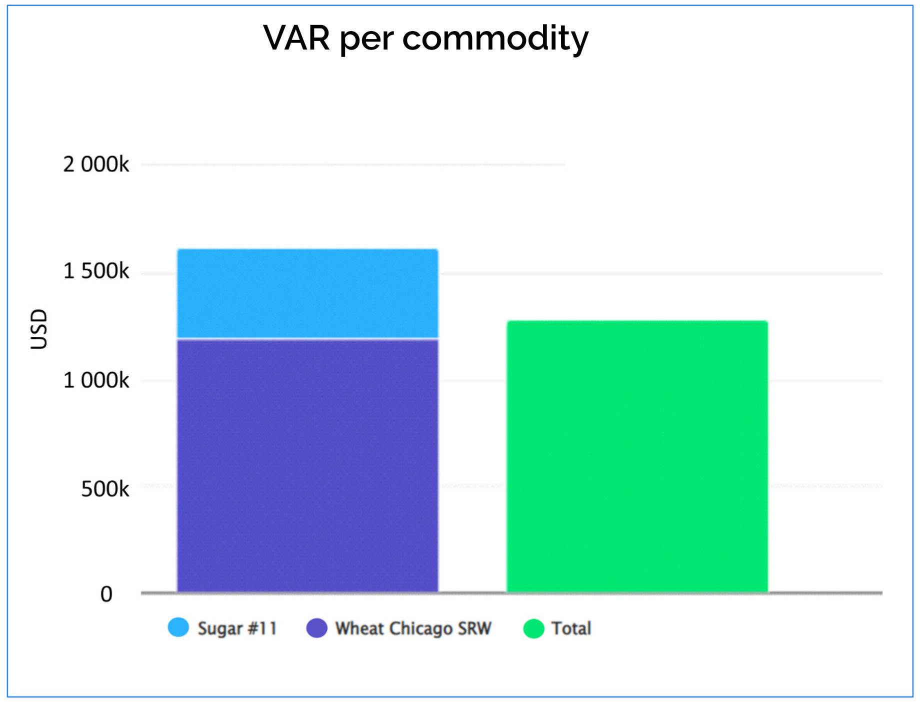


Value-at-Risk

The Value-at-Risk shows the '95% worst-case' impact on your MtM due to various price changes in the short-term.

The graph shows the Value-at-Risk for a basket of commodities: left for the individual commodities wheat and sugar, on the right for the two together. Do you notice the difference? The combined exposure is lower than the sum of the two because the commodity prices are not strongly correlated.

See in the table the Value–at-Risk calculations for 1 day. We also show how quickly the value could go up (or down) for 10 days (holiday scenario). Beware that this is not the maximum. The actual cost increase may be higher with 5% probability.



VAR Per commodity: 1 day vs 10 days - all amounts in US Dollars.

		22 February 2023		23 October 2023	
Commodity	Exposure	1 day	10 days	1 day	10 days
Wheat	5 million bushel	1,403,200	4,408,100	1,188,959	3,674,156
Sugar #11	66,138, mio Lbs	235,350	698,360	431,043	1,328,100
Total individual		1,730,850	5,106,460	1,620,002	5,002,256
Total basket		**1,495,500**	**4,656,800**	**1,281,489**	**4,0475,101**

Market Trend

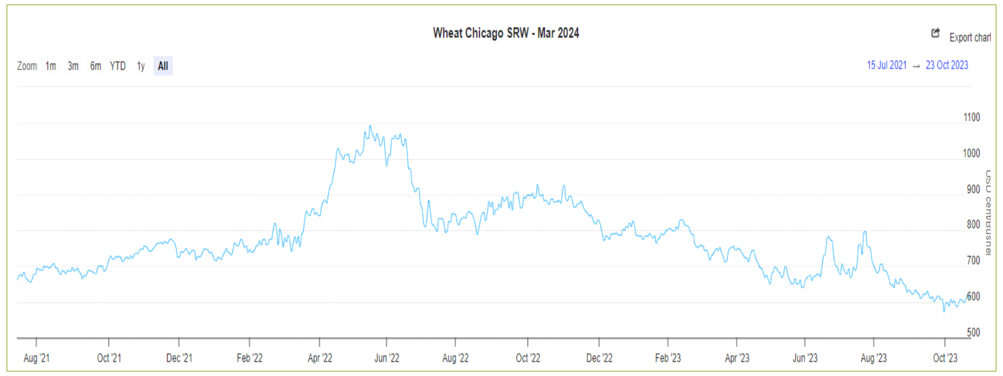
In February we calculated that the costs of buying this portfolio of wheat and sugar would be USD 51.5 million. In October, the same portfolio would cost USD 49.3 million. The two graphs underneath show the price development for each commodity individually.

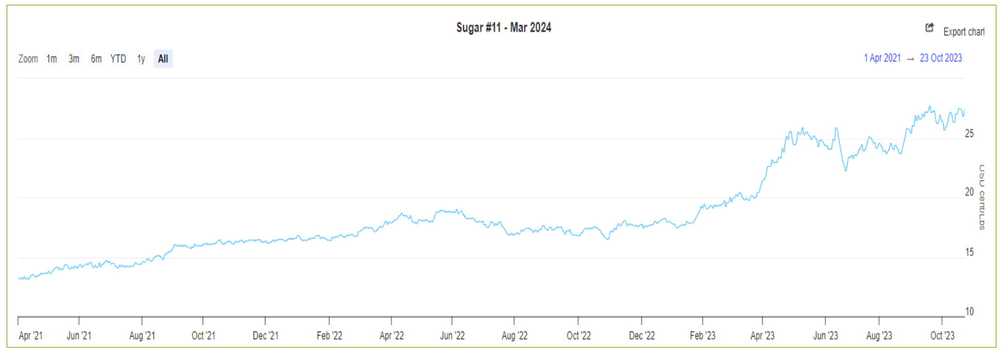
For wheat, the year so far shows a gradual decline, despite two peaks at the beginning of July and August, when prices were back to 780 - 800 $cents per bushel - the same as in February. However, that uplift was only temporary, and prices have fallen by nearly 20% since then. The situation in Ukraine remains critical, and wheat output has halved.

If we thought that sugar prices were high in our last report (Feb 2023), we see that they can go even higher. Prices went up considerably, increasing more than 40% since February. Demand for sugar remains high, while supply is tight, especially with the news that top-exporter India is not raising its export quota.

Looking at the Cashflow-at-Risk, we estimated in February with 95% confidence that the total costs of buying the portfolio would not be more than USD 84.2 million. The October amount is USD 49.3 million and safely falls within this bandwidth.

Compared to our February calculations, the CfaR has gone down to USD 18.2 million, which is mainly due to the cheaper wheat prices which makes up the largest part of the portfolio. Also, the risk horizon left until the start of 2024 is much shorter, minimizing the risk. The Value-at-Risk (VaR), however, did not go down so much - from nearly USD 1.5 mio to 1.3 mio.





Advantages KYOS Portfolio and Risk Management System

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.

Accumulators - embedded options

Many clients in the food & beverage industry use accumulators to manage the price risk. KYOS has developed software to verify price valuations. It enables our clients to have an independent calculation of the value as well as the MtM. It also enables clients to play with the strikes to find their optimum.

KYOS adds value

To help you understand price risks and improve your company's cash flow prediction, KYOS has developed risk management software to effectively manage any commodity portfolio. This software is 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 all departments

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.

This is just a brief overview of what we can offer you. Have a look at our website **www.kyos.com** for more detailed information.

Do not hesitate to contact us for more information, or a short demonstration: **info@kyos.com**

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