



KYOS Commodity Risk Solutions

Insights in risks

Aluminium, coffee and corn



June 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 three 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:** what is the impact on 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: aluminium, coffee, corn

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

Commodity	Amount	24 January 2023		5 June 2023	
		Average price	Total	Average price	Total
Aluminium	30.000 MT	2725 \$/MT	\$ 81.8 mio	2345 \$/MT	\$ 70.6 mio
Coffee (Arabica)	30 million Lbs	157.89 \$ cents/Lbs	\$ 48.0 mio	176.24 \$ cents/ Lbs	\$ 52.9 mio
Corn	5 mio bushel	575.09 \$ cents/bu	\$ 28.7 mio	538.40 \$ cents / bu	\$ 26.9 mio
Total			\$ 158,5 mio		\$ 150.4 mio

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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 (=18 months) can be presented as the potential cashflow difference between:

Sourcing volume * current market prices versus
Sourcing volume * simulated market prices

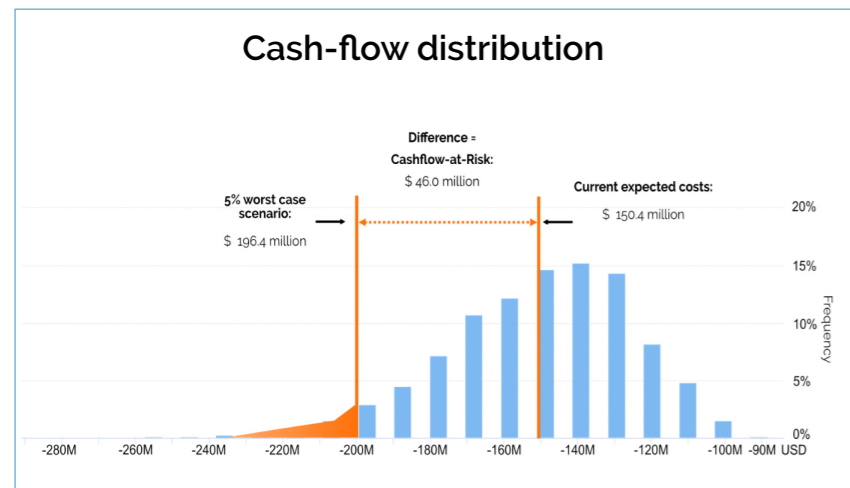
	24 January 2023	5 June 2023
Current value	\$ 158.5 million	\$ 150.4 million
5% worst case scenario	\$ 226.8 million	\$ 196.4 million
Cashflow-at-Risk	\$ 226.8 - 158.5 = \$ 68.3 million	\$ 196.4 - 150.4 = \$ 46.0 million

We estimate with 95% confidence that the total costs to source these three commodities will not be more than USD 196.4 million. This means that the difference between the current costs USD 150.4 million and the worst-case costs (196.4) is the CfaR of USD 46.0 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 150.4 million?

Or leave it open? There is a 5% chance that costs will go up and you have to pay an extra USD 46.0 million—or more.

The graph underneath shows the distribution of the CfaR.

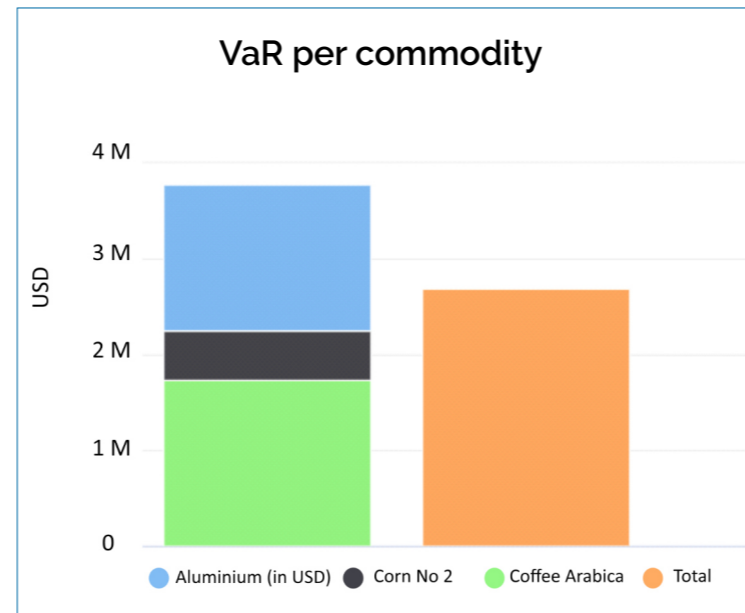


Value-at-Risk

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 aluminium, coffee and corn, on the right for all three together. Do you notice the difference? The combined exposure is lower than the sum of the three 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.

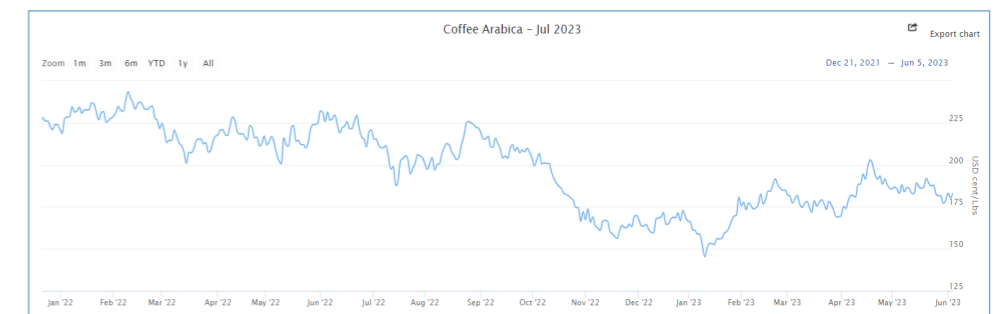
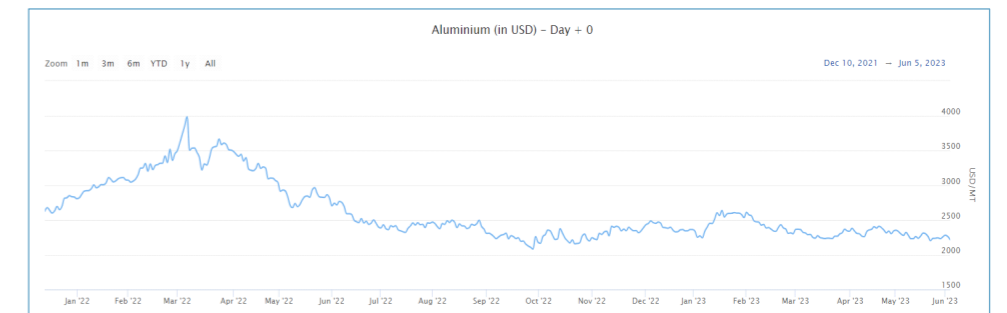
Commodity	Exposure	24 January 2023		5 June 2023	
		1 day	10 days	1 day	10 days
Aluminium	30,000 MT	2,764,700	7,911,600	1,540,100	4,829,100
Coffee	30 million Lbs	1,656,900	4,875,900	1,742,400	5,124,000
Corn	5 mio bu	583,230	1,756,800	501,480	1,512,700
Total individual		5,004,830	14,544,300	3,783,980	11,465,800
Total basket		3,511,100	10,092,000	2,697,000	8,223,400

Market Trend

If we compare the costs of buying the same portfolio in January 2023 and now in June, we see that costs have gone down from \$ 158.5 million to \$ 150.4 million, a drop of 5.4%. Underneath, the graphs show the price development per individual commodity. Prices of aluminium and corn declined since February, whereas those of coffee Arabica went up.

When you look at the Cashflow-at-Risk, the total costs to buy the portfolio will be \$150.4 million. In January 2023 we stated with 95% confidence that the total costs would not be more than \$ 226.8 million - we can conclude that the June amount falls within this bandwidth.

Both the CfaR and VaR have gone down since January 2023. This is due to three factors: lower market prices on average (lower expected costs), lower volatility of the market prices, and a shorter period left until the start of 2024 (the portfolio under consideration). In three months we will recalculate these figures so we can compare.





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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