

United Nations Conference on Trade and Development

14th Multi-Year Expert Meeting on Commodities and Development

09-11 October 2023, Geneva

Hedging Techniques for Critical Minerals

By

Guillaume Albasini, Independent Consultant, Switzerland

The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.

HEDGING TECHNIQUES FOR CRITICAL MINERALS

GUILLAUME ALBASINI



INTRODUCTION

DEFINITIONS

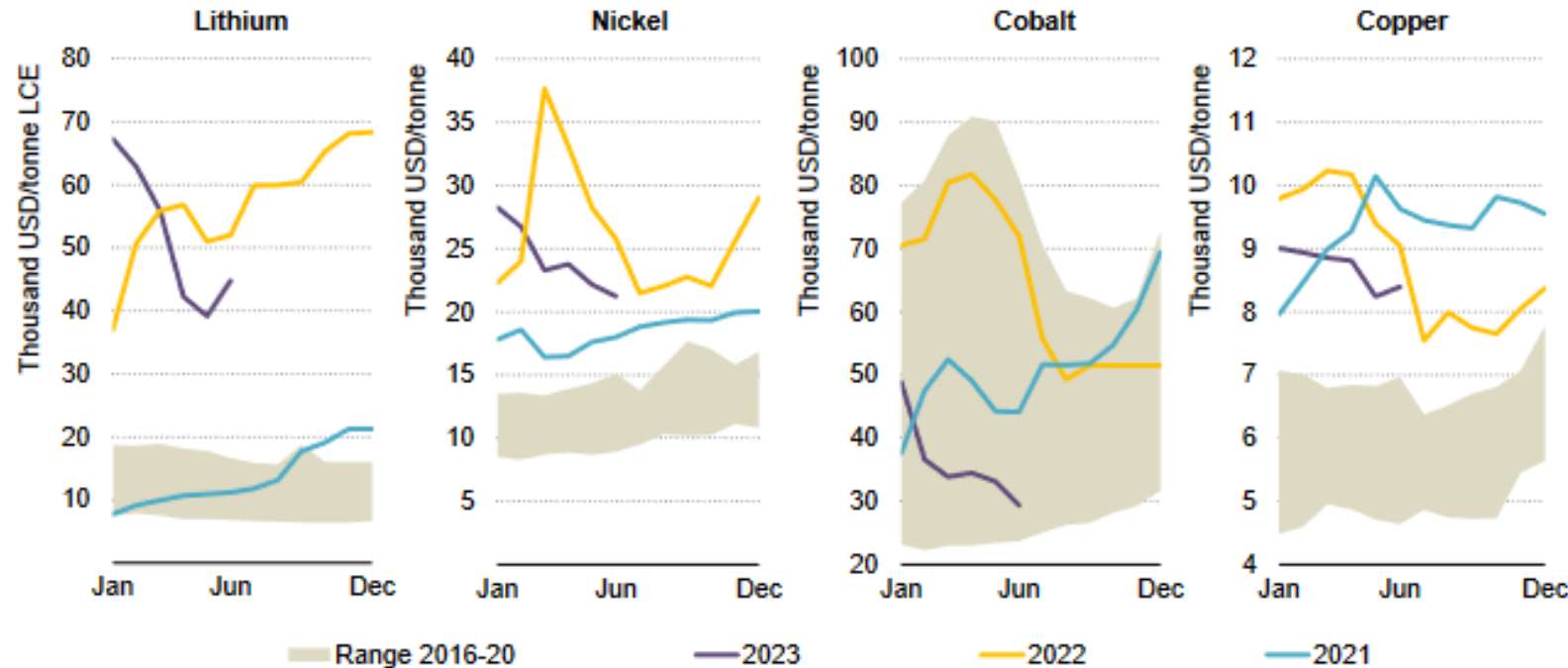


- Hedging is a risk hedging strategy that limits or neutralizes the risk of loss and protects against unexpected events that may impact the price of traded assets. Unlike most investment techniques, hedging is not about generating profits, but about reducing losses. It can be similar to insurance.
- A critical mineral is a mineral that is considered essential to the global economy and is at risk of scarcity due to its scarcity or difficulty of extraction (difficulty that can be technical, economic or geopolitical). There is no single official list of critical minerals, as the exact definition of a critical mineral can vary depending on the source and circumstance.

VOLATILITE

VOLATILITÉ DES COURS

Price development for selected energy transition minerals and metals



- Critical minerals are subject to high price volatility, which has particularly increased in recent years as a result of events such as the pandemic, the war in Ukraine or uncertainties about global growth.

IEA. CC BY 4.0.

Notes: LCE = lithium carbonate equivalent. Assessment based on LME Lithium Carbonate Global Average, LME Nickel Cash, LME Cobalt Cash and LME Copper Grade A Cash prices (nominal).
Source: IEA analysis based on S&P Global.

HEDGING

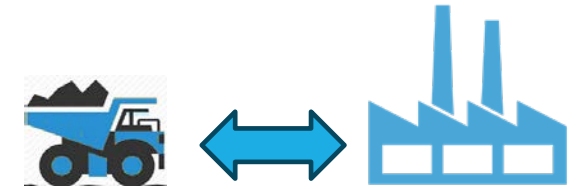
TECHNIQUES DE HEDGING

- There are several hedging techniques that can be used to protect against price volatility:
 - Forward contracts
 - Futures contracts
 - Options
 - Swaps
- Risk hedging can include fluctuations in commodity prices, but also exchange rate fluctuations or interest rates.



FORWARD

FORWARD FUTURES



- A forward contract is a customizable agreement between a buyer and a seller, in which they agree to exchange an asset at a later date at a pre-agreed price.
- The selling price is determined in advance, which protects you from a possible drop in the price.
- Cost is an opportunity cost (you don't benefit from a favorable development if it takes place).
- **Example:** A nickel producer contracts with a battery manufacturer to sell 1000 tons of nickel in 3 months at a price of \$18,000 per ton. The seller protects himself from a possible drop in the price of nickel while the buyer protects himself from a possible rise. At the scheduled maturity, if the price of nickel has fallen, for example, to \$16,000 per tonne, the seller is a winner since he can sell his production at a price of \$18,000 per tonne. In the opposite case, if the price has risen to \$20,000 per tonne, it is the buyer who gets a good deal, as the seller has to sell at the agreed price and cannot take advantage of the increase in the price on the market.

FUTURES

FUTURES



- A futures contract (futures contract) is an agreement that commits to the purchase or sale of a commodity or financial asset at a predetermined price and at a specific time in the future. In order to be traded on the stock exchange, futures are standardised in terms of quality and quantity
- **Example:** A copper producer plans to sell 5000 tons of copper in 6 months. To protect himself from market volatility, he decided to hedge by buying 200 futures contracts on the London Metal Exchange (LME) for the 6-month sale of 25 tonnes each at a price of \$8000/t. Shortly before the delivery date, the producer asks his broker to settle the position financially by selling the futures. If the price is at that time \$7000/t, selling the contract yields $1000 \times 5000 = 5$ million. At the same time as the financial transaction, the producer proceeds to the physical sale of copper to the consumer at the market price, which brings him $5000 \times 7000 = 35$ million (i.e. 5 million less than if he had been able to sell them at \$8000). Provided that this is agreed on the basis of the official settlement price in the market, the price risk of the commodity over the period is eliminated as the profits of one transaction (+5 million) offset the losses of the other (-5 million).

FUTURES

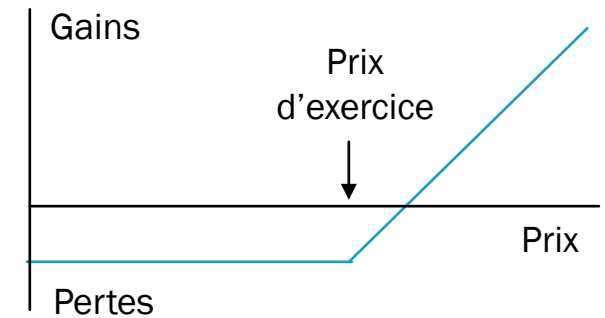
FUTURES

- Most of the contracts traded on commodity futures markets are "futures". Compared to forward contracts, futures contracts have the advantage of being protected from the risk of default by the buyer or seller because a clearing house replaces the seller or buyer if they do not meet their commitments.
- To guarantee themselves, clearing houses require the payment of initial margins and the daily payment of margin calls, the amount of which is updated according to the evolution of the price of the underlying commodity to which the contract relates.

	FORWARD	FUTURES
Type de contrat	Gré à gré	Marché organisé
Appels de marge	Non	Oui
Rupture anticipée	Non	Oui
Anonymat	Non	Oui
Contrats standardisés	Non	Oui
Frais de transaction	Non	Oui
Risque de défaut	Oui	Non

OPTIONS

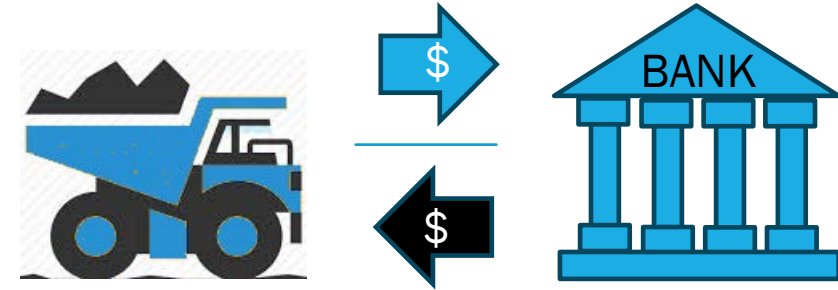
THE OPTIONS



- An option is a standardised financial contract that gives the holder the right, but not the obligation, to buy (call) or sell (put) an underlying asset at a predetermined price (strike price) on or before a given date.
- You only exercise the option if the market has moved unfavorably and you can exercise the option at any time before expiration. The cost is a premium to be paid
- **Example:** A copper producer wants to sell 5000 tonnes of copper in 3 months and wants to protect himself from a possible drop in the price of copper while keeping the opportunity to benefit from a possible increase in the price. He buys 200 put options of 25 tonnes on the LME during the 3-month option which is for example \$8000/t. At expiry, if the price is below \$8000/t, he can exercise his option and sell his 5000 tonnes at \$8000/t. If the price is higher, he does not exercise the option and can sell at the market price by taking advantage of the rise in the price of copper. His profit, however, is reduced by the cost of the options he had to buy to protect himself.

SWAPS

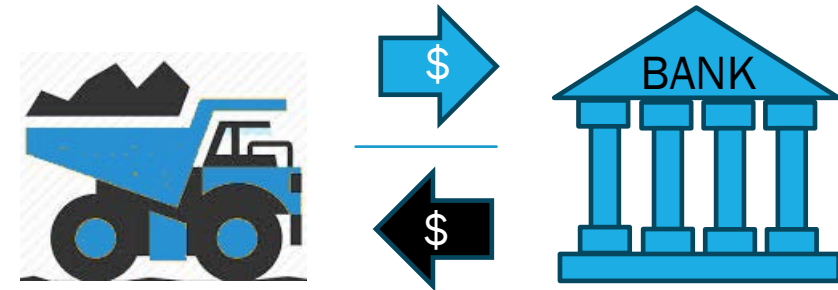
SWAPS



- A commodity swap is a type of derivative contract in which two parties agree to exchange cash flows based on the price of an underlying commodity by swapping a fixed price for a variable price, most often calculated as the average of an index over a future period. One of the parties (commodity user or financial institution) guarantees the price of the underlying and accepts payments on the fixed price for a given period of time. In exchange, he receives a stream of variable payments based on the market price of the commodity, an obligation usually tied to the producer.
- A swap must include elements such as a maturity schedule, the term, the starting date, the value of the fixed rate, the nature of the underlying, the nominal amount, the basis of calculation and the reference of the floating rate.
- Swaps are not exchangeable. They are traded over the counter between financial professionals. It is the banks that act as intermediaries between the various parties.

SWAPS

SWAPS



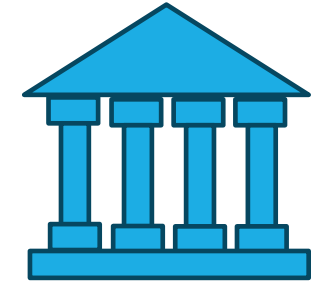
Example: A producer producing 2000 tonnes of Class 1 nickel per month wants to hedge against price volatility by ensuring a stable income. He is negotiating a commodity swap contract with a bank. The producer and the bank agree on a schedule (payments at the beginning of each month), the duration (1 year), the departure date (November 1, 2023), the value of the fixed rate (a price of \$18,000/t), the nature of the underlying (Class 1 nickel), the nominal amount ($\$18,000 \times 2000 = \36 million), the basis of calculation (average of the nickel price during the past month) and the variable rate reference (nickel at the LME). The bank becomes a fixed payer while the producer becomes the floating payer. Let's imagine that in the first month the average nickel price was \$17,000/t, which is below the agreed fixed price. The bank will then pay the producer the difference, i.e. $1000 \times 2000 = 2$ million to guarantee the producer a fixed income. If, on the other hand, the following month the price of nickel soars to \$22,000/t, the average price being higher than the agreed price, it is the producer who will pay the difference to the bank, i.e. $4000 \times 2000 = 8$ million. Note that it is the payment streams that are exchanged and not the principal amount. There is no exchange of commodities but only cash flows. The risk (negative or positive) is transferred from the producer to the bank.

MARCHES

FUTURES AND OPTIONS MARKETS

- Principaux marchés de produits dérivés pour les métaux :
 - London Metal Exchange (LME)
 - Chicago Mercantile Exchange (CME)
 - Shanghai Futures Exchange (ShFE)

- In recent years, new futures contracts related to battery metals have emerged.
 - Contrat cobalt du LME (2010)
 - Contrat cobalt du CME (2021)
 - Contrat hydroxyde de lithium du LME (2021)
 - Contrat hydroxyde de lithium du CME (2022)
 - Contrat carbonate de lithium du CME (juin 2023)
 - Contrat hydroxyde de cobalt du CME (octobre 2023)



	LME	CME	ShFE
Aluminium	25 t	25 t	5 t
Cuivre	25 t	25'000 lb	5 t
Nickel	6 t		1 t
Lithium (hydroxyde)	1 t	1 t	
Lithium (carbonate)		1 t	
Cobalt	1 t	1 t	
Cobalt (hydroxyde)		1 t	

Exemple de contrats disponibles

Noir : contrats Futures et Options disponible

Bleu : seulement contrats Futures

CONCLUSION

STABILIZING REVENUES IS POSSIBLE, BUT IT COMES AT A COST

- Techniques exist to hedge against commodity price risks. They each have advantages and disadvantages. The choice of whether or not to use hedging and, if so, the choice of technique to adopt depends on several factors such as:
 - The objectives you want to achieve
 - The level of risk aversion
 - Knowledge of the market
 - The market situation (high or low initial price)
 - The use of derivatives is more attractive when the price level is high because the risk of being confronted with a sharp decline is greater.
 - Derivatives are mainly suitable for short-term hedging.
 - These are sometimes complex instruments that must be understood and mastered in order to benefit from them.

MERCI



Guillaume Albasini

Analyste en mines et énergie

guillaume.albasini@sunrise.ch