Risk return profile of commodity derivatives: an investors perception

Perfil de retorno de risco de derivados de mercadorias: uma percepção dos investidores

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Abstract
This article provides an overview of the literature on the commodity market, with a particular focus on the risk of commodity investment. The sources of return in the commodity market are examined, as well as the impact of various macroeconomic factors such as interest rates and inflation on the return. The commodity market is an increasingly popular investment opportunity for investors looking to diversify their portfolio. However, investing in commodities is not without risk. The volatility of commodity prices can lead to significant losses for investors, especially those who are not familiar with the market. One of the primary sources of return in the commodity market is through price appreciation. This is driven by supply and demand factors, such as changes in weather patterns, geopolitical events, and changes in consumer tastes. In addition, commodities can also generate returns through passive income, such as through rental income from real estate or dividends from stocks. Interest rates and inflation are two key macroeconomic factors that can have a significant impact on the return of commodity investments. Higher interest rates can lead to lower

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commodity prices, as investors seek out higher yield investments. Inflation can also impact the return of commodity investments, as it can lead to higher prices for raw materials and other inputs. For wheat, corn, and soybean futures, seasonality of return is an important consideration for investors. The prices of these commodities are often influenced by seasonal factors, such as weather patterns and harvest cycles. Understanding these seasonality patterns can help investors make more informed investment decisions. In conclusion, this study is mostly descriptive in nature, providing an overview of the literature on the commodity market and the risks associated with commodity investment. The impact of various macroeconomic factors, such as interest rates and inflation, on the return of commodity investments is also examined. Finally, the seasonality of return for wheat, corn, and soybean futures is discussed as an important consideration for investors.


**Resumo**
Este artigo fornece uma panorâmica geral da literatura sobre o mercado de matérias-primas, com particular incidência sobre o risco do investimento em matérias-primas. São analisadas as fontes de rendimento no mercado de matérias-primas, bem como o impacto de vários fatores macroeconômicos, tais como as taxas de juro e a inflação, sobre o rendimento. O mercado de commodities é uma oportunidade de investimento cada vez mais popular para investidores que buscam diversificar seu portfólio. No entanto, o investimento em mercadorias não está isento de riscos. A volatilidade dos preços das matérias-primas pode conduzir a perdas significativas para os investidores, especialmente para aqueles que não estão familiarizados com o mercado. Uma das principais fontes de retorno no mercado de commodities é a apreciação dos preços. Isso é impulsionado por fatores de oferta e demanda, como mudanças nos padrões climáticos, eventos geopolíticos e mudanças no gosto do consumidor. Além disso, as mercadorias também podem gerar retornos através do rendimento passivo, como por exemplo através do rendimento de rendas de imóveis ou dividendos de ações. As taxas de juro e a inflação são dois fatores macroeconômicos fundamentais que podem ter um impacto significativo no retorno dos investimentos em matérias-primas. Taxas de juro mais elevadas podem levar a preços mais baixos das matérias-primas, à medida que os investidores procuram investimentos em rendimentos mais elevados. A inflação pode também ter impacto no retorno dos investimentos em matérias-primas, uma vez que pode conduzir a preços mais elevados das matérias-primas e de outros fatores de produção. Para
os futuros do trigo, do milho e da soja, a sazonalidade do retorno é uma consideração importante para os investidores. Os preços destas matérias - primas são muitas vezes influenciados por fatores sazonais, tais como padrões meteorológicos e ciclos de colheita. Compreender estes padrões sazonais pode ajudar os investidores a tomar decisões de investimento mais fundamentadas. Em conclusão, este estudo é principalmente descritivo por natureza, fornecendo uma visão geral da literatura sobre o mercado de commodities e os riscos associados ao investimento em commodities. É também analisado o impacto de vários fatores macroeconômicos, tais como as taxas de juro e a inflação, no retorno dos investimentos em matérias - primas. Finalmente, a sazonalidade do retorno dos futuros do trigo, do milho e da soja é discutida como uma consideração importante para os investidores.


Introduction

A commodity is a kind of good for which there is market demand but no quality variability in the supply. A market is a real or virtual meeting place for buyers and sellers to negotiate the purchase and sale of goods and services in return for cash or barter. You have discovered the commodities market if you are seeking a location to purchase or sell raw resources as opposed to completed items. There are options to purchase and sell in the location. This market is where all economic factors will converge to decide a reasonable selling price for the goods. A gold exchange-traded fund (ETF) is based on "electronic gold," which eliminates the need to acquire and store physical bullion in costly depository locations. The London bullion market and other expensive depository locations are no longer necessary with gold exchange-traded funds (ETFs). ETFs based on gold are based on "electronic gold," eliminating the need to store precious metals in expensive depository locations like the London bullion market. Unlike physical bullion that needs to be stored in expensive depository facilities such as the London bullion market, gold exchange-traded funds are based on electronic gold rather than physical bullion. The London bullion market is too expensive to store physical bullion like gold bullion, so gold exchange-traded funds (ETFs) are based on "electronic gold." With gold ETFs, you don't have to acquire or store gold bullion at costly depository locations, such as London, by purchasing "electronic gold." Exchange-traded funds for gold, or ETFs, are based on electronic gold, eliminating the need for physical bullion to
be deposited in a costly depository. By using electronic gold as the basis for their investment funds, gold exchange traded funds (ETFs) eliminate the need to acquire and store physical gold in costly locations such as the London bullion market. ETFs based on "electronic gold" eliminate the need to acquire and store physical bullion at costly depository centers such as the London gold market. A gold exchange-traded fund (ETF) consists of electronic gold that eliminates the need for physical gold to be kept in depository locations, such as London. Commodity futures were motivated by the consistent availability of harvest-time agricultural products. (Yang, 2022).

**Literature Review**

There is a massive increase in trading in commodity derivatives over the two decades decade. The growth that outpaces the growth in the output of commodities and the demand for derivatives by industrial producers and consumers of commodities to manage risk. Along with the swift growth of trading in all derivative markets, trading in commodity derivatives also increased. This trading was a direct result of the need to find larger yields in an economy with low interest rates. Both over-the-counter (OTC) trading and organised exchanges saw growth, but OTC trading experienced a much higher increase in gross market value. This rise is significant to note because counterparty failure in OTC trading of mortgage derivatives played a crucial role in the previous crisis (Basu and Gavin 2010). Marketing resources result in broad offers that give partners in any business and businesses that typically use these resources a competitive advantage. Additionally, marketing resources shift in terms of their direct or indirect commitment to having the upper hand(Cacciolatti & Lee, 2016; Gaur, Kumar & Singh, 2014).

According to a study, age and income significantly affect the frequency of trading in the commodity market, the style of trading, and the market segmentation choices. Age and income factors accounted for 72% of the variation in investor sentiment. There are other reports on gauging risk and estimated rates of return. The majority of investors have a portfolio of investments, so it is important to think about how to assess an asset's risk when it is a component of a sizable portfolio of assets. The reasons why the needed rate of return on an asset fluctuates over time. Both macroeconomic events that influence all investment assets and microeconomic events that only affect a particular asset produce changes (Sathyakala et al., 2022)
Seetha and Nitya (2016) looked into how investors view the capital market. The financial well-being of investors will be significantly impacted by investing. Knowing your risk tolerance and investment goals will help you make smarter decisions. The authors examined investor demographics, investment practices, and knowledge of the risk and return of various capital market channels. The researchers also provided information on the crucial elements that investors take into account when making investing selections. The psychology of investing and psychological personality features also have a role. The decision of the investing strategy depends on the following factors: emotional stability, extraversion, risk, return, agreeability, conscientiousness, and logic. The study's findings indicate that these investor personality factors affect how people make decisions and have a significant impact on choosing an investing strategy (Chitra & Sreedevi, 2011).

The differences in perception among businessmen and salaried and its factors will affect the investing decision and commodity market (Kotwani and Chaturvewi, 2017). Investor Perception Differs Between Salaried and Businessmen: A Study of Commodity Market Influencing Factors. The study of investor perceptions through survey methods, like as questionnaires and in-person interviews, is a new field in behavioural finance. The majority of studies concentrated on mutual funds, stocks, and the individual investor risk tolerance levels and perceptions differ based on personality. On the basis of primary data, the standard statistical methods ANOVA, SEM, Factor analysis, and multiple regression analysis have been employed to evaluate the perception of investment (Prasad, 2020).

Objectives

The research aimed to fulfill the following objectives:

- The study of risk in the commodity market
- Sector understanding of the risk involved with commodity prices
- Return in the commodity market

Methodology

In 1975, India gave birth to the concept of organized commodity trading. In spite of this, the commodities derivatives market was almost non-existent before 2002, with the exception of a small amount of over-the-counter (OTC) activity, due to worries about unnecessary speculation. In 2003, however, the government abolished forward trading bans...
on a broad range of commodities, realizing that future trading as a tool for price risk management and price discovery can only flourish if physical trade is allowed. As a consequence of the government's efforts to develop the market in terms of technology, transparency, and trading activity, India has seen an increase in the number of modern exchanges, the variety of commodities authorized for derivative trading, and the value of commodity futures trading. Commodity futures exchanges The need for a constant supply of seasonal crops led to the development of commodity futures. India was the genesis of the concept of organized commodities trading in 1975. Prior to 2002, the commodity derivatives market was almost non-existent, with the exception of over-the-counter (OTC) trading, which was forbidden in 1952 due to the danger of unnecessary speculation. In 2003, however, the government abolished forward trading restrictions on a broad range of commodities, recognizing that future trading as a tool for price risk management and price discovery can only flourish if physical trade is unfettered. According to Dr. G. Chandrasekhar, editor of the Hindu Business line, this has led to "extraordinary development" in the Indian economy, as measured by the number of modern exchanges, the variety of commodities allowed for derivative trading, and the value of commodities futures trading. Similarly, elaborated on the government's efforts to improve the market technologically, openly, and commercially. On India's 6 National and 16 Regional markets, 109 commodities are now accessible for futures trading. The essence of risk is the chance of incurring a debilitating loss. In the realm of finance, the risk is the uncertainty associated with making an investment. In other words, the risk is the probability that an investment's actual return will differ from its anticipated return. According to the current investing philosophy, the more you risk for an investment, the more you stand to earn from it if it pays off.

**Risk in the Commodity Market**

Commodity buyers run the risk of having to pay more than they planned. When purchasing commodities, buyers are at risk of paying more than they had budgeted for. Purchasing commodities can lead to overspending. Commodities may cost more than planned for those who purchase them. If you purchase commodities, you risk paying more than you planned. The danger of purchasing commodities is that they may end up paying more than they planned. If one purchases commodities, they may have to pay more than they anticipated. When purchasing commodities, buyers risk paying more than they budgeted. It is possible for buyers of commodities to end up paying more than they anticipated. When purchasing commodities,
buyers may pay more than expected. Higher prices for wood, for example, push up the cost of producing furniture, which in turn has a negative influence on the profit margins of furniture producers. Many furniture manufacturers are required to purchase wood.

A drop in commodity prices poses a threat to those who produce commodities. If the prices of certain crops are expected to be high this year, farmers may decide to plant more of such crops on land that has a lower potential yield. The farmer can end up losing money on the increased yield that was planted on less fruitful soil if prices decline the next year. This is another kind of risk associated with the prices of commodities. The risk may be hedged by either the producers or the consumers of commodities via the use of commodity markets. (Zeisberger, 2020)

Understanding the Risk Involved with Commodity Prices

Not only are traders in the commodities markets in danger from the risk associated with the price of commodities; but companies and consumers are also vulnerable to this risk. This is due to the fact that the purchasing and processing of numerous commodities, such as metals and energy as well as agricultural and food goods, and requirement of raw materials to the completed products. As a consequence of this, shifts in pricing may have an effect on a variety of factors, including the cost of gasoline at the pump, as well as the cost of food or plastic items.

Finance risk is the chance that an investment's return may differ from its anticipated return. If capital is at risk, investment is risky. Benefits are modest when uncertainty is low (low risk). Big risks bring high rewards. The risk-reward trade-off balances risk reduction with gain. Investment risk is the chance of a poorer return. Investments may be lost. The Commodity Market Faces Many Threats, Credit risk is the likelihood of a counterparty defaulting. Buyers and sellers lose when market values drop. Market liquidity risk, which makes agreements harder to balance.

Since the exchange regulatory structure forbids specific behavior, "legal risk" emerges from the possibility of legal challenges. Operational risks—such as power outages or slow Internet connections—threaten a company's market competitiveness. Businesses risk financial loss if interest rates or foreign exchange rates fluctuate unexpectedly. Foreign currency transactions expose the company to this risk. Commodity investment risk, like stock market risk, must be managed. Diversification can control idiosyncratic risk, also known as residual risk, industry risk, or unsystematic risk, which affects a few organizations. Commodities are best invested in when equities are low and futures curves are back war dated since rewards fluctuate over time. In times of excess, both the stock level and the price may be modified to
balance supply and demand; in times of scarcity, only the price can be adjusted. Backwardation and contango let us evaluate markets with a maximum price difference between front and rear months. (Stål Nacke, 2019)

Backwardation happens when product scarcity drives buyers to pay more for urgent delivery of goods. Systematic Macroeconomic Risk - s (Aggregate / Irreversible risk) is sensitive to events that affect aggregate outcomes, which stem from market structure/dynamics that create shocks generated by government policy, international economic force/acts of nature. Several things threaten the macroeconomy. The interest rate environment and inflationary atmosphere have affected commodity prices (whether in a raising or lowering inflation environment). Investing in commodities during supply times or unfavorable macroeconomic conditions might have negative implications.

future risk premium Joseph Kang (2005) found three main success factors. He also considers delivery risk as a future risk premium driver. He proposes adding net hedging pressure and delivery risk to the factors that determine the futures market risk premium. claim that options and futures risk premium variables are equal. This research suggests that delivery risk and hedging pressure may affect future risk premiums. found systemic risk in commodity futures' vulnerability to inflation, real interest rates, and currency exchange rates. Gold and oil have exposed investors to real interest rates and the U.S. dollar index. Most commodities are more affected by US real interest rate increases than agricultural items.

Consider portfolio and strategy risks.

Unintentional concentration risk exists in diverse portfolios. Corporate, company, and functional strategy levels help categorize business strategy risk. Commodities futures in an alternative portfolio may boost returns or minimize risk. According to International Business and Management Studies, investors may maximize rewards and minimize risk by forming a collection of uncorrelated assets (2014). Even if the commodities risk premium declines owing to financial investment, says commodities are still beneficial assets to a diversified portfolio. Spot price, interest rate, jump timing and jump size risks are the four sources of uncertainty for a commodities market contract. Material diffuses from high to low concentrations. Stock levels affect commodity futures risk premiums, according to Milos Boskovic (2009). Based on futures basis, recent futures excess returns, or volatility, portfolios that select commodities futures with below-normal inventories should have the highest risk premiums. (Cheng et al., 2018)
This asset class has attracted the attention of both academics and industry experts because of the recent increase in the commodities market. In a number of respects, commodities are unique from other financial assets. In the commodity markets, there are two sorts of returns:

- Spot return, which comes from price fluctuations in the present, and
- Roll return, which derives from rolling future bets to take advantage of shifting commodity prices at various delivery dates.

- The yield on any kept margin for a future position (collateral return).

Long commodity futures contracts get their return primarily from the risk premium, but also from other variables, such as collateral returns and just-in-time inventory requirements, which try to guarantee that commodities are always available to meet customer demand. Futures market "weather fear premia trades" are another solid means of generating money. In this kind of exchange, the future price of a commodity is set by a fear premium due to upcoming weather occurrences that may alter supply and demand. convenience yield as the premium obtained by possessing the real thing as opposed to only having a claim to it (Cheng et al., 2018)
In the journal Financial Analysis, Gorton of Penn and Rouwenhorst of Yale analyzed the historical returns of commodity futures indexes. Throughout the duration of their research, they determined that fully collateralized commodity futures have historically generated the same return and sharp ratio as equities. The objective of Hillary till’s (2006) study is to uncover the elements that contributed to the recurrence of similar incidents in the past. She contends that the disparity between futures and spot prices for commodities yields large gains. Rebalancing a commodities investor's portfolio might be advantageous in two ways. Combining low-correlated, highly volatile instruments may result in additional index-level returns, as she illustrates by analyzing the returns of 16 futures contracts for commodities throughout the period. As outlined by PIMCO's Geer (2000) in his journal, value-weighted construction entails that each commodity will be allocated a specified percentage of the portfolio's value. The index depicts the approach of selling rising futures and buying falling ones in order to maintain the index's value as prices fluctuate. It is anticipated that commodity investors would see the return potential of the rebalance. Hillary will discuss roll yield as one of the structural sources of return. The roll yield is the return on investment realized by futures investors when a backwinded futures market forces a future contract to converge (roll-up) to the spot price. A commodities futures contract is in contango when its underlying spot price is greater than its strike price; a futures investor will suffer negative roll yield as the contract approaches the lower strike price. (Isleimeyyeh, 2020)

The whole "Excess Return" is comprised of the Spot Return and Roll Yield.

Total return equals the sum of spot return, roll yield, and collateral return. She also mentioned that upward trend changes (paradigm shifts) in spot prices, such as the one that occurred in the early 1970s, maybe a significant source of returns.

The research examines the cash flow of momentum trading. It is shown that backwardation and contango in commodity futures markets are connected with momentum returns. Results indicate that momentum methods favor the purchase of backwardation futures and the sale of contango futures.

The relationship between an asset's return and volatility is an important topic of research in the world of finance.

The GARCH-IN-MEAN technique takes into consideration the risk-return relationship as well as seasonality in return and variance (risk). When using mean and variance dummies to discover the seasonal effect. Except for June, gold investments provide a positive return every other month. The returns on soybeans are negative for seven months and positive for five. Gold's positive risk-reward relationship is statistically significant, but soy beans'
positive but insignificant association is not. On the gold market, seasonal dummies have an unbalanced effect. Positive and negative seasonal variations in the risk and return relationship for gold are seen. The return component of gold has no seasonal impact, but the risk component has a negative seasonal effect. The risk-reward dynamic of each commodity takes into consideration the influence of seasonality.

Investors are drawn to commodity markets because of their varied historical term structure and hedging, liquidity, and susceptibility to economic cycles. Numerous active trading approaches generate profits based on the term structure's predictability and net hedging pressure on premiums. The main active trading tactics are momentum/constraint, convenience yield, and net hedging pressure. Exclusive to the commodities futures market, the convenience yield and net hedging pressure are important for gaining a comprehensive empirical evaluation of the association between the term structure and the returns on commodities. (2019)

![Risk/Return Relationship](image)

**Figure 2. Risk/Return relationship**

**Conclusions**

Returns in commodity markets are continuing for an extended period of time (persistent), clustering closely together (clustering), and being asymmetric (not identical). In the instance of soybean, a positive risk-return connection is identified, but it is determined to be minor, but a considerable positive risk-return relationship is found in the case of gold. There was found to be seasonality in both risk and return, which points to the asymmetric character of return as well as a negative connection between return and its volatility. In each
of these three instances, the systematic risk associated with the futures contracts for wheat, corn, and soybeans is very near to zero. During the same time period, the average returns on the contracts were very close to zero. There is both an asymmetrical influence and a seasonal effect in the commodities market. The effects of seasonality are included in the risk-reward relationship associated with each commodity. The recovery of the gold price demonstrates that the seasonal dummies have an asymmetrical influence on the gold market. In the risk and return section of the gold price, the seasonal dummies are a mix of positive and negative signs. In the month of June, a negative seasonal impact is detected in the volatility component of the gold market, however, the return part of the gold market indicates that there is no seasonal effect. Futures contracts on commodities have a strong relationship with inflation and may be used as a hedging instrument to protect oneself from unanticipated price swings. The rebalancing and the recovery of the index level come into play. The commodities that are held in the portfolio may be thought of as a basket of assets that are either highly uncorrelated or just mildly correlated. The rebalancing technique will most likely result in long-term excess return.

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