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# Commodity Seasonality Report: Do Soybeans and Natural Gas consistently follow Seasonal Patterns?

## Commodities

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# Index

# Introduction

Commodities are publicly traded interchangeable goods listed on the stock market that do not differ in any aspect between different providers (Fernando, 2022). Namely, they are non-distinguishable products that are typically bought as raw materials by producers in higher levels of the supply chain as inputs for other goods (Fernando, 2022). Commodities have essentially the same quality regardless of which producer is selling them (Fernando, 2022). Examples of commodities are grain, wheat, soybeans, and natural gas.

Generally, investors invest in commodities to provide differentiation and a potential hedge against inflation to their portfolios (Michael, 2021). This is due to the fact that commodities' performance is not necessarily linked to other asset classes' prices such as equities, thus often responding differently to major trends or events compared to the latter. To illustrate, commodities may be affected to a lesser extent by high rates of inflation compared to other asset classes, hence why having such an asset in one's portfolio may provide an effective safeguard against inflation (Spierdijk & Umar, 2013).

Nonetheless, this report will not investigate the effectiveness of commodities' hedging properties but will focus on another (perhaps less mainstream) topic instead. Namely, the concept of commodity seasonality. The following chapters will present graphs outlining price fluctuations of Soybean and Natural gas futures contracts over the past decade with the intention to present the concept of seasonality. Additionally, the analysis will attempt to provide some guidance with regards to the effectiveness of such an investment strategy for potential commodity investors.

Did Soybean and Natural Gas futures follow any recurrent seasonal pattern between 2011 and 2021, and if so, how often was that the case?

*Note: The following analysis is solely based on price fluctuations of futures contracts over the past decade. Line graphs are the only tool used to highlight any potential patterns in prices. Hence, the study's aim is to provide the reader with a clear and simple representation of the seasonality phenomenon, without the use of sophisticated graphics or overly advanced tools.

# Section 1: soybean futures contracts seasonality

Soybeans are seeds of a legume belonging to the pea family and are grown all over the world (Petruzzello, 2022). Due to their rich nutritional properties (such as high rates of protein), they are mainly used to feed animals and as ingredients for derived products such as soy milk or soy sauce (Petruzzello, 2022). Overall, this commodity is believed to consistently "follow a pattern" whereby soybeans futures prices reach their peak during the start of summer and fall towards the end of the season (CME Group, 2022). More specifically, according to the *CME Group*, such tendencies occur respectively in June (when their prices peak) and between August and September (when they gradually decrease) (CME Group, 2022). This phenomenon may occur due to the lower supply for Soybeans throughout the summer season, since harvesting generally begins in September, implying the increased unavailability of the product at that point in time (CME Group, 2022).

By analyzing soybean futures' prices over the past ten years, such a tendency may be clearly observed in some years between 2011 and 2021. For instance, Figure 1 illustrates soybean price fluctuations from May to September 2015.

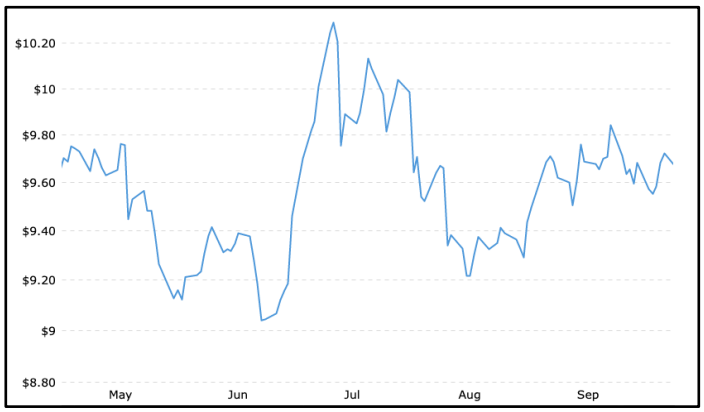
Figure 1: Soybean futures contracts prices between May and September 2015


*Source: Macrotrends, 2022*

As shown by the above graph, soybean futures contracts experienced a sharp rise in price between May and June 2015, where they peaked at about 10.50 US dollars. The relatively steep surge in price was then followed by a gradual adjustment between July and August (where the price went from about 10.40 USD to just over 9 USD per bushel). Subsequently, the commodity underwent a rather definite plunge with a lowest of 8.60 USD throughout August and September (*Soybean prices - 45 year historical chart*, 2022).

Similarly, Soybean futures experienced an analogous trend in 2017.

Figure 2: Soybean futures contracts prices between May and September 2017




*Source: Macrotrends, 2022*

Once again, the commodity experienced a slight decline between May and June, and steeply rose from mid-June to July, when it peaked at a value of about 10.30 USD per bushel. Additionally, the price fell in August and somewhat stabilized in September at about 9.70 USD. Therefore, it can be stated that soybean prices reacted to the summer season in an extremely similar way in 2015 and 2017, as shown by Figure 1 and 2.

However, the pattern shown by the above graphs was only occasionally satisfied throughout the past decade. Namely, Soybean futures seasonality trend (characterized by a peak in June followed by a drop in August, as hypothesized by the *CME Group*) held for four years only between 2011 and 2021 (*Soybean prices - 45 year historical chart*, 2022).

To illustrate, Figure 3 shows a completely different trend compared to the ones previously presented.

Figure 3: Soybean futures contracts prices between May and September 2018


*Source: Macrotrends, 2022*

In 2018, neither a rise in June nor a drop in August were registered. In fact, Soybean price per bushel experienced a steep fall in the end of May by going from selling for about 10.50 USD at the start of the month, to trading for 8.60 USD by the end of June. Hence, this graph shows how the pattern was not always satisfied.

Nonetheless, if taken individually, the two tendencies (being a surge in June and a fall in August to September) had a success rate of respectively 60 and 70 percent between 2011 and 2021, which are far more supportive results. Hence, although Soybean futures' hypothesized seasonal

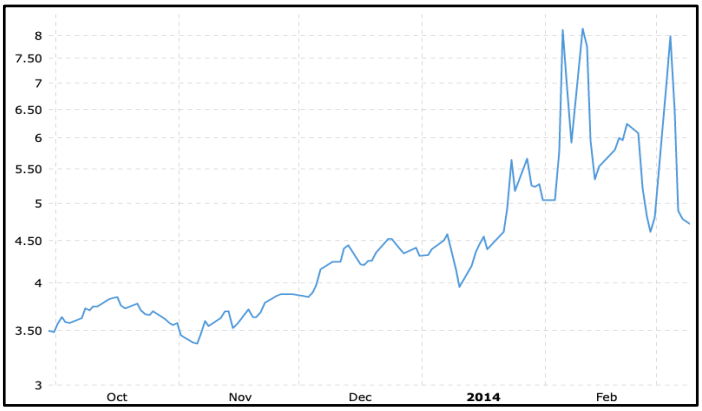
pattern did not turn out to hold for more than four years between 2011 and 2021, some degree of seasonal influence on prices per bushel does seem to exist (*Soybean prices - 45 year historical chart*, 2022). To illustrate, the fact that Soybeans experienced a rise in price in June for six years out of ten, and a fall in price in August for seven years might show that, to a certain extent, seasons do indeed affect this commodity's price fluctuations in a similar way over time (*Soybean prices - 45 year historical chart*, 2022).

# Section 2: natural gas futures contracts seasonality

Natural gas is a fossil fuel formed between layers of the Earth's crust (Pines, 2022). It is believed to have formed over hundreds of millions of years from dead organisms trapped beneath the surface (Pines, 2022). This commodity is found on both land and sea and is extracted through wells (Pines, 2022). Natural gas is an extremely important resource as it serves to supply about half of the energy used by the United States alone and is used both by industrial sectors and for residential purposes (Pines, 2022). Being mainly used for energy and heat, Natural gas is believed to be significantly affected by weather conditions and seasons (Nouicer & Piebalgs, 2021). Namely, this commodity's price is generally expected to rise whilst the winter approaches and drop by the end of the season (Nouicer & Piebalgs, 2021).

Figure 4 shows Natural gas price fluctuations between October 2013 and February 2014.

Figure 4: Soybean futures contracts prices between May and September 2018

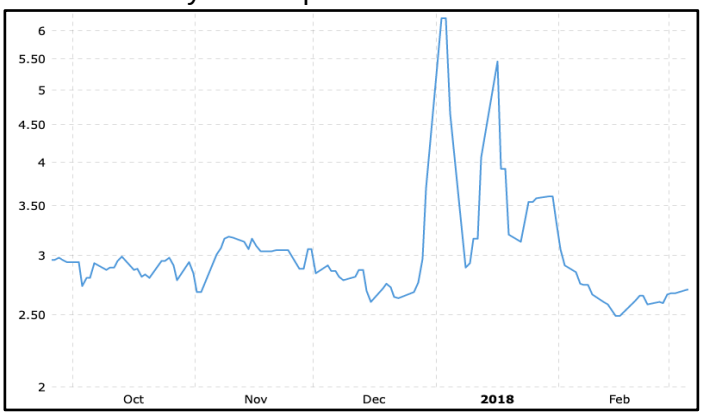



*Source: Macrotrends, 2022*

As illustrated above, Natural gas experienced a gradual and smooth increase in price from 3.50 USD at the beginning of October 2013 to trading for about 4.50 USD per barrel in December, where it then spiked to trading for about 8 USD between January and February 2014.

A similar pattern may be observed in Figure 5, which displays Natural gas futures price between October 2017 and February 2018.

Figure 5: Soybean futures contracts prices between May and September 2018




*Source: Macrotrends, 2022*

As already occurred in 2013-2014, Natural gas prices experienced a severe and quick surge between December 2018 and January 2019, where the price of the underlying went from just over 2.50 USD to over 6 USD per barrel in less than one month. Figures 4 and 5 both seem to confirm a similar trend which may highlight the effect of cooler temperatures (brought about by the winter season) on Natural gas futures.

However, as also observed with Soybean futures, such a trend was only partly satisfied throughout the decade (namely for five years out of ten) (*Natural gas prices - historical chart*, 2022). Hence, although there appears to be evidence to infer relevant effects of seasonality on natural gas prices, a fifty percent success rate is yet too unpredictable of a result for investors to rely on entirely when investing in the commodity.

To illustrate, Figure 6 displaying natural gas prices between October 2011 and February 2012 shows a significantly different scenario, where prices per barrel fall at a relatively constant rate from 3.60 USD in October to just over 2.20 USD by the end of December. Such a graph provides evidence to the unreliability of seasonal factors alone, as such discrepancy between graphs 4 or 5 and 6 might highlight the effects of other (perhaps more relevant) agents which affect Natural gas price movements to a greater extent in some instances. For example, these may include economic growth or competition with other fuels used for similar purposes (EIA, 2021).

Figure 6: Soybean futures contracts prices between May and September 2018


*Source: Macrotrends, 2022*

# Conclusion

As highlighted throughout the report, soybeans and natural gas did, to some extent, appear to be consistently affected by seasons over the past decade. Nonetheless, as previously mentioned, the rate at which this has happened within the past then years does not provide significant evidence to embrace the topic of commodity seasonality as a true, recurrent phenomena. This may be due to the fact that commodities are significantly affected by additional factors which may perhaps outweigh the effects of seasonal shifts in some instances. To illustrate, commodity prices are also greatly affected by technology advances in mining, harvesting or extracting resources which may alter supply, and consequently, prices (Trostle, 2008). In addition, commodities (like other asset classes) are also closely linked to the value of the US dollar, current energy prices and agricultural costs of production (Trostle, 2008)/ A decrease in value of the US dollar and an increase in energy prices and costs would imply a surge in the price of commodity futures (Trostle, 2008). Moreover, seasons themselves may be incredibly unpredictable. Climate change and other natural disasters might cause seasons to change, and consequently, affect commodity ptices both in the short and long term (Lindisova, 2019).

Therefore, the analysis encourages investors to take seasonality into consideration and to be aware of its potential impact on commodity future prices. However, future or current commodity investors should undoubtedly also take additional factors into consideration as part of their investment research and strategy. As outlined above, commodities' demand and supply hardly ever rely on seasonal factors alone. If all other relevant factors are also taken into consideration, investors will most likely have a greater chance of earning satisfactory returns on their commodity investments.

# Bibliography

Fernando, J. (2022, January 5). *What is a commodity?* Investopedia. Retrieved February 18, 2022, from https://www.investopedia.com/terms/c/commodity.asp

Lindisova, E. (2019, March 27). *Commodity spreads 15: Why the seasonality is not enough?* SpreadCharts.com. Retrieved February 20, 2022, from https://spreadcharts.com/commodity-spreads-15-why-the-seasonality-is-not-enough/

Michael, G. (2021, October 24). *The 3 best commodities in which to invest*. Investopedia. Retrieved February 18, 2022, from https://www.investopedia.com/financial-edge/0412/the-3-best-commodities-to-invest-in.aspx#:~:text=Investing%20in%20commodities%20can%20provide,geopolitics%20all%20affect%20commodity%20prices.

*Natural gas prices - historical chart*. MacroTrends. (2022). Retrieved February 21, 2022, from https://www.macrotrends.net/2478/natural-gas-prices-historical-chart

Nouicer, A., & Piebalgs, A. (2021, December 14). *Some reflections on current gas market price trends*. Florence School of Regulation. Retrieved February 21, 2022, from https://fsr.eui.eu/skyrocketing-energy-prices/

Petruzzello, M. (2022). *Soybean*. Encyclopædia Britannica. Retrieved February 18, 2022, from https://www.britannica.com/plant/soybean#ref348405

Pines, L. (2022, February 2). *Natural gas: Read this before you start trading this valuable commodity*. Commodity.com. Retrieved February 21, 2022, from https://commodity.com/energy/natural-gas/

*Soybean prices - 45 year historical chart*. MacroTrends. (2022). Retrieved February 21, 2022, from https://www.macrotrends.net/2531/soybean-prices-historical-chart-data

Spierdijk, L., & Umar, Z. (2013). Are commodity futures a good hedge against inflation? *The Journal of Investment Strategies, 3*(2), 35–57. https://doi.org/10.21314/jois.2014.048

Trostle, R. (2008). *Global Agricultural Supply and demand: Factors contributing to the recent increase in food commodity prices*. U.S. Dept. of Agriculture, Economic Research Service.

*U.S. Energy Information Administration - EIA - independent statistics and analysis*. Factors affecting natural gas prices - U.S. Energy Information Administration (EIA). (2021, October). Retrieved February 21, 2022, from https://www.eia.gov/energyexplained/natural-gas/factors-affecting-natural-gas-prices.php

*Understanding seasonality in grains - CME Group*. Futures & Options Trading for Risk Management - CME Group. (2022). Retrieved February 18, 2022, from https://www.cmegroup.com/education/courses/introduction-to-agriculture/grains-oilseeds/understanding-seasonality-in-grains.html