Navigating the Commodity Market with Language Models

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Abstract

Commodities are of utmost concern to the global economy. Still, their availability is by nature exposed to worldwide distributed issues such as logistics (theft, perish, delivery accidents), geopolitical developments (corruption, war, reforms, sanctions), and environmental influences (weather). While traditional sources of information like inventory reports, weather forecasts, and satellite data can provide insights, they often lack accessibility, timeliness, and reliability. As an alternative news publications, offer a rich, diverse, and timely source of information on events impacting commodities. Yet, the sheer volume of news data of approximately 50,000 publications daily on commodities, presents a challenge in extracting actionable intelligence.

Recent advancements in Natural Language Processing led to the emergence of Large Language Models (LLMs) which offer a promising solution to manage this vast amount of text data. However, empirical observations reveal that LLMs fall short in classifying how specific news affects the availability of certain commodities. central problem is LLMs' ethical, moral, and environmental evaluation of news. These evaluations may not accurately capture a commodity's availability or market value. For example, LLMs could negatively rate news about an oil platform accident, causing injuries or deaths, due to ethical concerns. However, such an incident leads to a decrease in supply, thereby having a positive effect on the oil price. This contradicting classification suggests that the complex interplay between supply and demand is not always reliably captured by conventional LLMs. This is because they primarily focus on the general sentiment rather than the asset-specific implications, even with optimized prompts.

To address this problem, we introduce NewsForce, a research project that combines language models with economic models. This enables the development of commodity-specific language models, such as CrudeBERT, which is designed for the crude oil market. As a result, the language model was able to more accurately capture the complex interplay between supply and demand in the oil market, thus pragmatically estimating the availability of crude oil. The classifications from the LM developed by NewsForce show a notably higher degree of relationship to the WTI oil prices relative to the classifications of a financial LM.

This outperformance highlights the significance of merging economic principles with language models. Further experimentation shows that our method is adaptable to other non-precious commodities. These include coffee and iron, showcasing its flexibility and potential to transform commodity market analysis by enabling timely identification of risks from the global news traffic.