



An economic analysis of global oilseed market trends and demand dynamics

K Sivakumar* and S Alexzander

PG & Research Department of Economics, Sacred Heart College (Autonomous), Tirupattur-635 601

*Corrospounding author: nvkshivashc@gmail.com

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Abstract

The global market for oil seeds, encompassing key crops such as soybeans, sunflower, canola, groundnut, mustard, castor, coconut (copra) and palm kernels, has witnessed remarkable growth over recent decades. This expansion is fuelled by rising population levels, increasing disposable incomes, and shifting dietary preferences towards healthier food options. Additionally, the versatile use of oil seeds in biofuel production has further augmented demand, aligning with global efforts to reduce reliance on fossil fuels and combat climate change. This study aims to analyse the intricate patterns of production, consumption, and trade that characterize the oil seeds market. By examining geopolitical influences, trade policies, technological advancements, and climate variability, we provide a comprehensive overview of the factors shaping market dynamics. Understanding these trends is essential for stakeholders across the supply chain, enabling them to navigate challenges and capitalize on emerging opportunities within this critical agricultural sector.

Keywords: *Oilseeds, demand, production forecast, market analysis, supply chain, export-import trends, biofuel demand, geopolitical impacts*

Introduction

Oilseeds play a pivotal role in the agricultural sector, serving as the cornerstone for producing protein-rich meals indispensable for human nutrition, livestock feed, and many industrial applications. Over the past few decades, the global market for oil seeds has burgeoned, spurred by a confluence of factors such as an increasing global population, rising disposable incomes, and evolving nutritional preferences that increasingly lean towards healthier and more sustainable food options. These seeds, well-known for their high oil content and nutritional value, are also integral to the burgeoning biofuel sector. They have gained significant traction as countries worldwide strive to diminish their reliance on fossil fuels and address the burgeoning threat of climate change. Among the numerous oil seeds, a few key varieties stand out and dominate the global market: soybeans, sunflower, canola, and palm kernels. Each of these seeds offers unique benefits and applications, contributing significantly to both the food and energy sectors. Soybeans, for instance, are highly valued not only for their oil but also for their high protein content, making them a staple in both human diets and animal feed. Sunflowers yield oil that is prized for its light taste and health benefits, especially its low saturated fat content.

Global level oilseed market trend

Canola oil, derived from the seeds of the canola plant, is

another heart-healthy option that has found widespread use in both culinary and industrial sectors. Meanwhile, palm kernels are a crucial source of palm oil, a highly efficient and versatile oil that is utilized in a wide array of products ranging from food to cosmetics and biofuels. The market dynamics for oil seeds are deeply influenced by a multitude of factors. Geopolitical developments, for instance, can have profound impacts on trade flows and market stability. Trade policies, including tariffs and trade agreements, play a crucial role in shaping global supply chains and pricing structures. Technological advancements in agricultural practices and biotechnology are continually enhancing crop yields, resistance to pests and diseases, and overall sustainability of oil seed cultivation. However, these advancements must contend with the ever-present challenge of climate fluctuations, which can significantly affect crop production and yield variability. Understanding these intricate and interwoven factors is essential for stakeholders across the oil seed supply chain. For farmers, staying abreast of market trends and technological innovations can inform their cultivation practices and crop choices, ultimately impacting their profitability and sustainability. Processors and manufacturers must navigate these trends to optimize their production processes and product offerings. Investors, meanwhile, must scrutinize market signals and trends to make informed decisions. Policymakers play a pivotal role in crafting regulations and policies that can foster market stability, promote sustainable agricultural practices, and support the development of renewable

energy sources. The global oil seed market is a dynamic and complex landscape characterized by significant growth and transformation. Its importance extends beyond traditional agricultural realms, touching on critical issues such as food security, sustainable development, and energy independence. As such, a comprehensive understanding of market trends, demand drivers, and influencing factors is indispensable for all stakeholders involved in this vital sector.

USA projection and forecast about oilseed demand

U.S. oilseed manufacturing for 2024/25 is projected at 131.5 million tons, up 0.3 million from the previous month, with will increase for rapeseed, peanuts, and cottonseed, in part offset through discounts for soybeans and sunflower seed. Soybean production is projected at four. 4 billion bushels, down 15 million on the decreased harvested area. The harvested area is forecast at 85. three million acres inside the June Acreage report is down 0. 3 million from the ultimate month. The soybean yield forecast was unchanged at 52. zero bushels in line with acre. With barely decreased starting shares, decreased production, and unchanged use, ending shares for 2024/ 25 are projected at 435 million bushels, down 20 million from the previous month.

Foreign oilseed production for 2024/25 was reduced slightly on lower sunflower seed output, extra frequently than now, no longer offset by the useful resource of the usage of higher rapeseed. Sunflower seed manufacturing is decreased on decreased yield possibilities for Russia and Ukraine because of warm and dry climate situations early within the season. Foreign rapeseed manufacturing is expanded for Canada and the EU. Foreign soybean manufacturing has unchanged with better manufacturing for Canada offset with the aid of decreasing manufacturing for Russia. Global soybean export shares for 2024/25 have been extended slightly, by better shares for China especially offset via way means of decreasing shares for Argentina, Brazil, and Paraguay because of revisions for 2023/24.

Argentina's soybean production for 2023/24 was revised down 0.5 million lots to 49.5 million guided via way means of records from Argentina's Ministry of Agriculture, Livestock and Fisheries. China's soybean imports for 2023/24 were revised up 3.0 million tons to 108.0 million on larger-than-anticipated arrivals expected in the fourth quarter of the marketing year. Exports to Argentina, Brazil, Paraguay, Benin, and Canada also are raised for 2023/24.

With slightly higher beginning stocks and lower global production and relatively small changes to use in 2024/ 25, global soybean stocks are reduced by 0.1 million tons to 127.8 million on lower shares for Argentina, Brazil, Paraguay, Russia, the EU, and the United States, generally offset with the aid of using better shares for China. The objectives were: i) To analyse international trade policies, tariffs, geopolitical factors, influences the global oil seed market; ii) To provide projected growth of the oil seeds market present production trends; iii) To give recommendations to improve the global oil seed market.

Umar Musa Mustapha (2016), Energy scenario studies are vital tools for predicting future trends in oil consumption, considering various influencing factors such as economic growth (measured by GDP), population size, and technological advancements. These studies utilize a range of models including MARKAL, LEAP, GREEN-X, PRIMES, MESSAGE, and MINICAM, each offering unique methodologies to thoroughly investigate current and future energy usage patterns. In addition to these complex models, simpler methods like power laws and regression analysis are often employed to forecast oil consumption, especially in countries like Mexico. E. W. Lusas (1983), they provide a comprehensive analysis of the processing practices for major oilseed crops, highlighting their significance as essential sources of both oil and protein. The study emphasizes the unique extraction and processing methods required for each type of crop, depending on their characteristics and the desired end products. Lusas underscores the economic importance of oilseed crops, noting their critical role in various industries.

Malhotra and Sharma (2016), The study reveals a strong relationship between futures trading activity and spot price volatility in commodity markets, particularly in oil and oilseeds in India. It examines how trading volume, open interest, and unexpected trader activities influence price volatility through advanced statistical models, including Augmented Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models and Granger causality tests. Theophilus M. Ikegwu *et al.* (2022), Oilseed processing in tropical regions faces numerous challenges, including technological gaps, inefficient machinery, and a lack of product quality standardization. These issues limit the sector's potential to achieve efficiency and competitiveness. However, there is significant room for growth if governments introduce targeted investment incentives and enforce stringent environmental regulations.

Materials and Methods

This study adopts a descriptive and analytical research design to investigate global oilseed market trends and demand dynamics. The study is based on secondary data sources collected from journals, websites, and other relevant materials. The study period will span the last 3 years (2022–2024) to ensure adequate analysis about oilseed production both world-wide and US. MS Excel and SPSS to be used to create table and correlation analyses to identify relationships between key variables such as oilseed production, oil meals and vegetable oil both world-wide and US output, supply and trade.

Results and Discussion

Data Analysis

From the table 1 it can be interpreted that there exists correlation between world output and world total supply is perfect (1.000) with a significance level of 0.000. This indicates a very strong and statistically significant positive relationship, meaning as output increases, total supply also increases proportionally. The correlation between world output and world trade is 0.943 with a significance level of 0.057. This indicates a strong positive relationship, but it is not statistically significant at the 0.01 level, implying that while there is a positive trend, it might not be reliable enough to draw firm conclusions. It is clearly understood that the world output is more than that of the world total supply and world trade in the study area. If the world output increases, changes in world total supply and world trade.

The correlation between U.S. output and U.S. total supply is perfect (1.000) with a significance level of 0.000. This indicates a very strong and statistically significant positive relationship. The correlation between U.S. output and U.S. trade is 0.271 with a significance level of 0.729, indicating a weak positive relationship, but it is not statistically significant. It is clearly understood that the U.S. output is more than that of the U.S. total supply and U.S. trade in the study area. If the U.S. output increases changes in U.S. total supply also change but no changes in U.S. trade.

From the table 2 it can be interpreted that there exists correlation between world output and world total supply is perfect (.996) with a significance level of 0.004. This indicates a very strong and statistically significant positive relationship, meaning as output increases, Total supply also increases proportionally. The correlation between world output and world trade is .953 with a significance level of .047. This indicates a strong positive

relationship, but it is not statistically significant at the 0.05 level, implying that while there is a positive trend, it might not be reliable enough to draw firm conclusions. It is clearly understood that the world output is more than that of the world total supply and world trade in the study area. If the world output increases, changes in world total supply and world trade.

The correlation between U.S. Output and U.S. Total supply is perfect (1.000) with a significance level of 0.000. This indicates a very strong and statistically significant positive relationship. The correlation between U.S. output and U.S. trade is .987 with a significance level of .013, indicating a weak positive relationship, but it is not statistically significant. It is clearly understood that the U.S. output is more than that of the U.S. total supply and U.S. trade in the study area. If the U.S. Output increases changes in U.S. total supply also changes U.S. trade.

From the table 3 it can be interpreted that there exists correlation between world output and world total supply is perfect (.998) with a significance level of 0.002. This indicates a very strong and statistically significant positive relationship, meaning as output increases, total supply also increases proportionally. The correlation between world output and world trade is -.557 with a significance level of .443. This indicates a strong positive relationship, but it is not statistically significant at the 0.05 level, implying that while there is a positive trend, it might not be reliable enough to draw firm conclusions. It is clearly understood that the world output is more than that of the world total supply and world trade in the study area. If the world output increases, changes in world total supply and world trade.

The correlation between U.S. output and U.S. total supply is perfect (.990) with a significance level of .010. This indicates a very strong and statistically significant positive relationship. The correlation between U.S. output and U.S. trade is .884 with a significance level of .116, indicating a weak positive relationship, but it is not statistically significant. It is clearly understood that the U.S. output is more than that of the U.S. total supply and U.S. trade in the study area. If the U.S. Output increases changes in U.S. total supply also changes U.S. trade.

Major findings

Through an analysis of key economic indicators, including global and U.S. output, supply, and trade, the study identifies critical interdependencies and trends. The findings reveal a perfect correlation between output and total supply, both globally and in the U.S., indicating

Table 1: Output, Supply and Trade of Oil seed between US and World

		Correlations					
		World Output	World total supply	World trade	US output	U.S total supply	U.S trade
World output	Pearson Correlation Sig. (2-tailed) N	1	1.000**	.943	.784	.790	-.385**
World total supply	Pearson Correlation Sig. (2-tailed) N	4	.000	.057	.216	.210	.615
World trade	Pearson Correlation Sig. (2-tailed) N	1.000**	1	.939	.776	.782**	-.396
U.S. output	Pearson Correlation Sig. (2-tailed) N	.000	.061	.061	.224	.218	.604
U.S. total supply	Pearson Correlation Sig. (2-tailed) N	4	4	4	4	4	4
U.S. trade	Pearson Correlation Sig. (2-tailed) N	.943	.939	1	.943	.945	-.061
		.057	.061	4	.057	.055	.939
		4	4	4	4	4	4
		.784	.776	.943	1	1.000	.271
		.216	.224	.057	4	.000	.729
		4	4	4	4	4	4
		.790	.782	.945	1.000**	1	.262
		.210	.218	.055	.000	4	.738
		4	4	4	4	4	4
		-.385	-.396	-.061	.271	.262	1
		.615	.604	.939	.729	.738	4
		4	4	4	4	4	4

**, Correlation is significant at the 0.01 level (2-tailed).

Source: www.usda.gov

Table 2: Output, Supply and Trade of Oil meals between US and World

	Output	Total Supply	Trade	Correlations		
				US output	US total supply	US trade
Output	Pearson Correlation Sig. (2-tailed) N	1 4	.996** .004 4	.953* .047 4	.987* .013 4	.986* .014 4
Total supply	Pearson Correlation Sig. (2-tailed) N	.996** .004 4	1 4	.926 .074 4	.996** .004 4	.995** .005 4
Trade	Pearson Correlation Sig. (2-tailed) N	.953* .047 4	.926 .074 4	1 4	.892 .108 4	.888 .112 4
US output	Pearson Correlation Sig. (2-tailed) N	.987* .013 4	.996** .004 4	.892 .108 4	1 4	1.000** .000 4
US total supply	Pearson Correlation Sig. (2-tailed) N	.986* .014 4	.995** .005 4	.888 .112 4	1.000** .000 4	.985* .015 4
US trade	Pearson Correlation Sig. (2-tailed) N	1.000** .000 4	.996** .004 4	.954* .046 4	.987* .013 4	.985* .015 4

**, Correlation is significant at the 0.01 level (2-tailed).

*, Correlation is significant at the 0.05 level (2-tailed).

Source: www.usda.gov

Table 3: Output, Supply and Trade of Vegetable Oil between US and World

	Output	Total Supply	Trade	Correlations		
				US output	US total supply	US trade
Output	Pearson Correlation Sig. (2-tailed) N	1 4	.998** .002 4	-.557 .443 4	.965* .035 4	.991** .009 4
Total supply	Pearson Correlation Sig. (2-tailed) N	.998** .002 4	1 4	-.607 .393 4	.947 .053 4	.982* .018 4
Trade	Pearson Correlation Sig. (2-tailed) N	-.557 .443 4	-.607 .393 4	1 4	-.320 .680 4	-.708 .292 4
US output	Pearson Correlation Sig. (2-tailed) N	.965* .035 4	.947 .053 4	-.320 .680 4	1 4	.884 .116 4
US total supply	Pearson Correlation Sig. (2-tailed) N	.991** .009 4	.982* .018 4	-.447 .553 4	.990** .010 4	.938 .062 4
US trade	Pearson Correlation Sig. (2-tailed) N	.966* .034 4	.981* .019 4	-.708 .292 4	.884 .116 4	1 .062 4

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: www.usda.gov

these variables are highly synchronized. Strong, positive correlations between world output, total supply, and trade suggest growth potential in the global oilseed market, although some of these relationships lack statistical significance, pointing to trends that need further validation.

While strong correlations exist between U.S. trade, output, and supply, these are not always statistically significant, suggesting that U.S. trade does not have a reliable or consistent influence on global trade dynamics. However, significant correlations at the 0.01 level demonstrate that U.S. trade is closely linked to both domestic and global output and supply, reflecting the importance of U.S. economic indicators in shaping oilseed market trends.

Moreover, weak or inverse relationships between trade and other key variables, such as output and supply, indicate that fluctuations in trade can negatively affect market performance, although these correlations remain non-significant. The study calls for further investigation into moderate correlations between U.S. trade and economic indicators, which may signal emerging trends that could influence future market dynamics.

Recommendations to the policymakers'

- To improve the global oilseed market, it is essential to enhance trade policies and reduce tariffs that hinder international exchange, allowing for more fluid global trade.
- Governments should prioritize multilateral agreements that promote fair competition and reduce geopolitical barriers affecting oilseed exports and imports.
- Investing in infrastructure, particularly in developing countries, can streamline supply chains and improve market access for smallholder farmers.
- Encouraging sustainable farming practices through incentives and technology can boost productivity while minimizing environmental impacts.
- Additionally, fostering stronger collaboration between oilseed producers, traders, and international bodies can ensure a more stable and transparent market.
- Lastly, promoting innovation in crop genetics and cultivation techniques will improve resilience to climate change, driving long-term growth in the oilseed sector.

Conclusion

The global oilseed market is characterized by strong interdependencies between output, total supply, and trade, both on a global scale and within the U.S. The study reveals that while perfect correlations exist between output and supply, there are inconsistencies in the strength and significance of the relationships between trade and other key variables. U.S. trade, in particular, shows a complex dynamic, with strong but not always statistically significant ties to global and domestic oilseed production. The findings indicate that, although there is growth potential in the oilseed market, some relationships require further validation due to weak or non-significant correlations.

Overall, the study highlights the need for targeted policy interventions to strengthen trade connections and address geopolitical challenges. Sustainable agricultural practices, improved infrastructure, and technological innovations are crucial to enhancing productivity and market efficiency. Addressing these issues will be key to supporting long-term growth and stability in the global oilseed market, benefitting both producers and consumers worldwide.

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