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Analysis of factors affecting the prediction of future saffron prices on the Iranian Commodity Exchange

Souad Ramezani Vanegah¹ , Hamid Reza Mollaei² , Amirhossein Taebi Noghondari³ 

1- Department of Financial engineering, Ke.C, Islamic Azad University, Kerman, Iran

2- Department of industrial management, Ke.C, Islamic Azad University, Kerman, Iran

3- Department of Accounting, Ke.C, Islamic Azad University, Kerman, Iran

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Abstract

The aim of the present study is to analyze the factors affecting the forecast of future prices of saffron in the Iranian Commodity Exchange. This research is applicable in terms of its purpose, and post-event in terms of its nature. The statistical population includes 20 experts in the field of agricultural economics, commodity exchange managers, and agricultural derivatives market activists, selected using a purposive and snowball method, and this process continued until it reached theoretical saturation. The data collection tool is an interview and a questionnaire. The DEMETL method was used for analysis. The findings showed that variables such as the agricultural sector credit facility rate, exchange rate, inflation rate, export rate, and inventory are in the group of influential variables, while factors such as production rate, allocated subsidies, production costs, global demand, and customs laws are considered among the influential variables. In terms of prioritization, the importance of allocated subsidies and saffron production rate are of the highest importance; Saffron exports, inflation rate and exchange rate are of high importance; production costs and drought index are of medium importance, and temperature changes and producer price index are of lesser importance.

Keywords:

Saffron pricing, futures markets, saffron futures contracts, risk management, production costs

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Corresponding Author: Hamid Reza Mollaei

Email: hrmollaei@iau.ac.ir

Extended Abstract

Introduction

Derivatives price evaluation in the Iranian Commodity Exchange is a subject that deals with the study and analysis of complex financial instruments known as derivatives. Derivatives are contracts whose value is derived from underlying assets such as commodities, stocks, currencies and interest rates (Kevin, 2024). In this regard, the Iranian Commodity Exchange, as one of the most important trading platforms in the country, provides the possibility of trading various derivatives such as futures contracts and options (Moradi et al., 2024). This is while the correct evaluation of the price of these derivatives plays a key role in risk management, improving market efficiency and increasing financial transparency (Fan & Sirignano, 2024).

Extreme price fluctuations are a characteristic feature of the derivatives market, which can occur due to sudden changes in supply and demand, political and economic events, and global factors. These fluctuations make it very difficult to correctly assess the price of derivatives (Grodek-Szostak et al., 2019). In addition, in the derivatives market, several factors such as interest rates, exchange rates, commodity prices, and economic and political conditions affect pricing (Cheng et al., 2018). Uncertainty about the impact of these factors can lead to increased risk and reduced accuracy in pricing (Holzermann, 2022).

In Iran, saffron, as a high-value-added commodity and a major contributor to non-oil exports, is of strategic importance in the country's agricultural economy. The launch of saffron futures on the Iran Commodity Exchange has been a step towards institutionalizing hedging instruments and discovering fair prices (Gholami Mehrabadi, 2014). However, the volatile behavior of saffron futures prices, influenced by exchange rate fluctuations, inflation, trade policy changes, and information asymmetry, has created a major challenge for analysts and policymakers. Previous studies have mainly attempted to explain saffron price behavior using statistical or econometric models such as GARCH, ARIMA, VER, and VACM, but these models are unable to represent the causal, feedback, and dynamic relationships between variables (Neufeld & Sester, 2022). On the other hand, existing studies have often focused on one or a few limited variables and have neglected a comprehensive and multidimensional approach to simultaneously analyze economic, policy, and behavioral effects. As a result, the need for an integrated framework that can model both the causal relationships between key variables and the behavioral dynamics of the market over time is seriously felt. Therefore, the main question of this research is: What are the factors affecting the prediction of saffron futures prices on the Iranian Commodity Exchange?

Theoretical Framework

Futures Markets

Futures markets, as one of the important financial engineering tools, play a fundamental role in improving market efficiency and hedging risk (Raei & Saeedi, 2017). These markets allow economic actors to manage their risk against price fluctuations through standardized futures contracts. In countries like Iran, whose economies are faced with currency, inflation, and political shocks, the importance of derivatives is doubled, especially in the agricultural sector. Saffron, as a strategic product, is an example of a commodity whose price fluctuations have wide-ranging consequences on producers' income and export policies. (Gholami Mehrabadi, 2014).

Gui (2025), examined stock market forecasting using a hybrid model and confirmed the superiority of hybrid models over single models in improving the accuracy of futures price

forecasting. His results showed that using time series analysis alongside machine learning algorithms can increase the reliability of forecasts.

Cohen (2024) also focused on consumption patterns in global markets, explaining the role of export policies and demand changes in determining the prices of agricultural commodities and concluded that changes in global demand, especially in emerging markets, are quickly reflected in futures prices.

Research Methodology

This research is applicable in terms of purpose, and post-event in nature. The statistical population includes 20 experts in the field of agricultural economics, commodity exchange managers, and agricultural derivatives market activists, selected using a purposive and snowball method, and this process continued until theoretical saturation was reached. The data collection tool is an interview and a questionnaire.

Research findings

The DEMET method was used for analysis. The findings showed that variables such as agricultural credit facility rates, exchange rates, inflation rates, export rates and warehouse inventory are in the group of influential variables; while factors such as production rates, allocated subsidies, production costs, global demand, and customs laws are considered among the influential variables. In terms of prioritization, the importance of allocated subsidies and saffron production rates are of the highest importance; saffron exports, inflation rates and exchange rates are of high importance; production costs and drought index are of medium importance, and temperature changes and producer price index are of lesser importance.

Conclusion

The present study aimed to analyze the factors affecting the prediction of future saffron prices on the Iranian Commodity Exchange. The results of this study are consistent with the results of Gui (2025), Cohen (2024), Garg et al. (2023), Baamonde-Suárez et al. (2023), Bagheri & Doliskani (2023), Morales-Banuelos et al. (2022), Fengqian & Chao (2020), Miyamoto & Kubo (2022), Barakchian & Baghernejad (2022), Mahaverpour et al. (2021), Amiri et al. (2021), Miyamoto & Kubo (2021), Bernal-Penke et al. (2020), Rostami et al. (2019), Gholami Mehrabadi (2014), and Kozmina & Kuznetsova (2018). Comparing the findings with previous research reveals important similarities and differences. Globally, studies such as Cohen (2024) and Fengqian & Chao (2020) emphasize the impact of macro variables such as exchange rates and inflation on derivatives pricing, which is consistent with the high sensitivity of the saffron futures market in this study. However, these studies mainly focus on advanced markets with economic stability and have paid less attention to local factors such as subsidies or climatic conditions such as drought.

The following suggestions were made based on the research results:

-Specialized training of traders in nonlinear analysis: It is essential for commodity exchanges to hold workshops and training courses for traders, focusing on nonlinear analysis and advanced volatility. These trainings should include an introduction to nonlinear time series modeling methods, chaos detection tests, and their practical applications in derivatives trading.

-Implementation of a price fluctuation alert system: Developing automated alert systems based on predictive models that issue automatic notifications to traders when prices cross predicted ranges can help manage risk and prevent losses from irrational behavior.