The Investigation of Time–frequency co-movement between Tehran Stock Market Price Index ,prices of oil and gold using Multiple Wavelet Coherence

Azam Mohammadzadeh *⬤, Mohammad Nabi Shahiki Tash ** and Kiana Zinati***

* PhD in Financial Economics, university of Sistan and Baluchestan, Faculty of Economics, Zahedan, Iran.
Email: *az.mohammadzadeh@gmail.com*
🅾 0000-0002-3983-2379
Postal address: Daneshgah university, zahedan, Sistan and baluchestan,5352, Iran

** Associate Professor of Economics, University of Sistan and Baluchestan, Faculty of Economics ,Zahedan, Iran
Email: *mohammad_tash@eco.usb.ac.ir*
Postal address: Daneshgah university, zahedan, Sistan and baluchestan,5352, Iran

*** Master of Industrial Management, Department of Management, Faculty of Management Economics and Accounting, Islamic Azad University, Tabriz Branch, Tabriz, Iran.
Email :*kiana.zinati@gmail.com*

EXTENDED ABSTRACT

INTRODUCTION

Many economic and financial time series, especially stock prices, have gone through stages in which their behavior seems to have changed significantly. This change in behavior in time series may be over time in terms of the mean value, variance, or covariance of the current values of the time series with its past values. Today, the analysis of a market separately from other markets is almost invalid and analysts need to conduct their analysis based on the relationships between different markets. In addition, it is important to pay attention to the relationship between different markets especially the relationship between domestic and international markets to study the behavior of different economic variables and their time series.

METHODOLOGY

Oil, gold and stock markets are complex, time-varying, nonlinear and multivariate economic systems that are affected by various factors such as political, military, economic, and supply and demand factors. And these few studies have focused on GARCH, VAR,… econometric methods that are based on linear regressions. Despite the importance of examining the relationship between the three variables of crude oil price, gold price, and stock price index, unfortunately insufficient studies have been done in this country. Given that the time series of crude oil, gold prices, and stock price indices are a combination of components of different cycles, the relationship between these variables has changed over time, and examining these variables separately provides only partial and perhaps misleading information. Therefore, in contrast to previous research, the correlation between the stock market, crude oil and gold has been investigated with a multivariate framework, in which the correlation of time intervals has been considered. In addition, due to the fact that previous studies have emphasized the effects of uncertainty of one variable on other variables separately and have not examined the simultaneous effects of several variables on another variable, in this study, the relationship between the three variables has been investigated in the form of simultaneous communication using wavelet analysis. The main purpose of this study is to investigate the relationship between the price of gold, oil and the stock price index of the Tehran Stock Exchange in different periods and time periods. In other words, in this research, we seek to answer these questions whether the stock price index of Tehran Stock Exchange is related to the price of international oil and gold assets and whether the cross-sectional relationship between the three variables has changed at different times and in different time zones. In line with the purpose of this article, in addition to using wavelet analysis and multiple correlation analysis, Granger causality and co-integration tests have also been used. The Johansson co-integration test was used to examine co-integration. The variables used in this research are daily time series data of gold price, crude oil price and stock price index of Tehran Stock Exchange from January 2003 to May 2016.

FINDINGS

The results obtained from this research (from R software) are as follows: 1- The above three time series have a significant correlation throughout the period. 2- The relationship between the stock market in Iran and the international markets of crude oil and gold has changed at different time scales. 3- Based on the results of the wavelet correlation of stock price index and crude oil price, in periods higher than 128 to 1024 days in the whole period (2003 to 2016) there is a high correlation. This issue indicates a temporary correlation between stock price index and crude oil price that fluctuates in the short term. 4- Based on the results of the correlation between the stock price index and the gold price, there are large correlation zones at intervals above 128 to 1024 days throughout the period. This issue indicates a temporary correlation between the stock price index and the gold price, which fluctuates in the short term.

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CONCLUSION

Therefore, according to the results of this study, it can be concluded that oil and gold assets are not suitable to cover the risk of stock price index and building a portfolio consisting of these three assets is not a good one because the price changes of these variables have a significant correlation. In addition, it can be concluded that in the real world, other factors affect the stock price index, which are suggested to be identified and studied in future research.

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