Applied Economics Studies, Iran (AESI) 55

Volume 10, Number 38, Summer 2021
Pp.: 55-68

DOI: 10.22084/AES.2021.24350.3303

Co-Movement Between Oil Price and Iranian Stock Market Returns: Wavelet Analysis Method

M. H. Fotros[1]
R. Maaboudi[2*]

Received: 2021/03/17 Accepted: 2021/06/19

Abstract

In the Iranian economy, the oil sector has a significant position; So that changes in oil price affect various economic sectors and markets, including the stock market. The stock market is one of the principal financial markets that can potentially attract the country's uncontrolled savings and liquidity in the form of an efficient channel and improve economic growth and development by turning it into investment. Therefore, it is essential to examine the relationship between oil price and Iran's stock market returns. Given the importance of the issue, the purpose of this paper is to investigate the co-movement between OPEC oil price and returns of the Tehran Stock Exchange market. To analyze the relationship between two variables, applied the wavelet coherence approach and utilized daily data during the period of 2009-2021. Findings show there is a positive correlation between oil prices and stock market returns. Comparison of the data in annual time-frequency scale indicated that the oil price and stock market returns are in phase from 2009 to 2011, and is observed a positive relationship between them. From December 2011 to August 2015, both variables are in phase, and oil price is the leading factor in the stock market. During the period 2015 to 2021, both variables are in phase, but coherency between oil price and stock market returns is not observed.

Keywords: Oil Price, Tehran Stock Exchange's Return, Wavelet Analysis Method, Coherence.

JEL Classification: Q_{41}, G_{14}, E_{32}.

1. Professor, Department of Economics, Faculty of Economic and Social Sciences, Bu Ali Sina University, Hamadan, Iran **Email:** fotros1950@yahoo.com
2. Assistant Professor, Faculty of Humanities, Ayatollah Borujerdi University, Borujerd, Iran (*Corresponding Author) **Email:** maaboudi@abru.ac.ir

1. Introduction

In the Iranian economy, the oil industry is a principal source of foreign exchange and income generation. Fluctuations in oil prices originate from exogenous developments and beyond the economic policymaker's control, which is the main reason for the country's economic disruption, causing the country's oil revenues to fluctuate widely (Fotros & Hoshidari, 2017). Due to the high dependence of Iran's economy on oil, oil price changes affect various sectors of the economy. One of the main sections is the Tehran Stock Exchange, which has had an upward trend in liquidity over the past decade. The stock market price index and its returns are important economic indicators that reflect the general level of prices and returns of firms operating in the stock market. Thus, changes in stock market earnings due to changes in the total stock price index reflect the expectations of individuals and capital market participants, the general trend of capital inflows and outflows, consequently, and movements of the stock market. With changes in oil price, firms accompanied by main changes in liquidity attraction, production, and employment, influenced their profitability and ultimately their market value. As a result, the market price index and stock market return change. Oil as an asset alongside other assets such as gold and share has a substantial role in the investment portfolio of economic actors. So, oil buyers and sellers try to diversify their investment portfolio and reduce their risk at a certain level of return; or they increase the return on the portfolio at a certain level of expected risk by converting their wealth into assets such as gold, currency, and stocks. As a result, fluctuations and volatilities of the oil price affect consumer behaviors and tendencies, financing markets, and investment (Balkilar & Azdemire, 2013).

According to the importance of the problem, the present study examines the relationship between the OPEC oil price and the return of Tehran's Stock Exchange using the daily data during the period of 2009-2020 and the continuous wavelet transform approach. By applying the wavelet transform approach, a dynamic causal relationship between oil price and the stock market return provides for the causality between the two variables and the type of causal relationship in the time-frequency analysis.

The remainder of the present paper is as follows: section two examines the literature review; section three introduces the research methodology; section four shows the experimental findings; finally, section five gives conclusions and suggestions.

2. Materials and Methods

The oil price is an important indicator that affects the political circumstances and economic sectors in the countries. The stock market plays a notable role in attracting and directing liquidity towards investing and production among different sectors. There are several channels through which oil price influences the stock market; in most of these channels, oil price affects the stock market by impressing the discounted cash flows. Global oil prices as influential and

exogenous variables concern many macroeconomic variables, macroeconomic variables leave an effect on discounted future cash flow, and therefore any asset price could be determined by its expected discounted cash flows, based on economic theory (Huang et al., 1996). As a result, oil price via changing the expected discounted cash flows of firms alters the price of shares, and therefore the return of shares. So, there is a relationship between oil price and shares market returns.

The main point is that the effects of oil price on macroeconomic variables differ for oil-importing and oil-exporting countries. In oil-importing countries, oil is considered a substantial input of production. Thus, an increase in oil price leads to a rise in the production cost of companies and manufacturing firms that active in the stock market, which ultimately leads to a decrease in corporate profits and a decline in their share prices and returns. In this context, Backus & Crucini (2000) and Arouri & Nguyen (2010) show that as oil prices rise, the cost of producing goods increases if oil is the substantial input of production. The rise in production costs, in turn, is transmitted to consumers, and the increase in the consumer price index leads to an increase in consumer expenditures and a reduction in their demand (Bernanke, 2006). In converse, in oil-exporting countries, rising oil prices are accompanied by rising incomes and wealth. As income and wealth increase, consumption and investment increase. Increasing consumption leads to increasing demand in society as a whole, and if appropriate policies and strategies are adopted, increased investment leads to increased production and, consequently, production and employment. In this case, the increase in oil prices leaves a positive effect on economic variables and ultimately leads to a rise in stock market prices and returns.

According to the different socio-economic characteristics between countries, there exist several empirical studies about the impact of oil prices on the stock market. Few studies concluded that the relationship between the stock market and oil prices is no significant (Haung et al., 1996; Apergis & Miller, 2009; Sukcharoen et al., 2014). Some studies showed that the relationship between oil prices and the stock market is significantly negative (Jones & Kaul, 1996; Sadorsky, 1999; Papapetrou, 2001; Miller & Ratti, 2009). Some Iranian researchers such as Samadi et al. (2007), Bordbar and Heidari (2017) using the GARCH method, and Salehi and Hamoleh Alipour (2018) applying the VAR approach achieved similar results. Numerous studies indicated a positive relationship between oil prices and the stock market (Boyer & Filion, 2009; Mohanty et al., 2011; Sakaki, 2019; Alamgir and Bin Amin, 2021). Iranian studies by Ebrahimi and Shokri (2011), Sadeghi Shahdani et al. (2013), Saghafi and Ghanbaian (2015), Fotros and Hoshidari (2016), Zaroki et al. (2018), Botshekan and Mohseni (2018), and Seifipour et al. (2019) are among the studies that confirmed the positive relationship between the stock exchange and oil. However, some Iranian studies show that the relationship between oil prices and the stock market is not constant and changes positively and negatively over time. The studies such as Keshavarz Haddad and Maanavi (2008),

Hosseyni Nasab et al. (2011), Abbasinejad and Ebrahimi (2014), and Shirinbakhsh et al. (2015) are among these cases.

Also, some recent works examined the relationship between the stock market and oil prices with a view of the Coronavirus effects. In that context, Chien et al. (2021) found that indices for oil demand, stock market, GDP growth, and electricity demand decreased significantly with an increase in the COVID-19 pandemic severeness index in the USA, Europe, and China. And, there was low co-movement with the stock exchange, exchange rate, and gold markets. Awan et al. (2021) analyzed the published research related to the volatility of the stock market and crude oil in G7 countries due to the outbreak of COVID-19 and concluded that the volatility of crude oil and stock markets of G-7 increased due to COVID-19.

In this paper, following Abid and Kaffel (2018), we use the coherence method to analyze the correlation between the organization of the petroleum exporting countries (OPEC) oil price and stock market return in different frequencies corresponding to various time horizons. To calculate the coherence between variables is applied the continuous wavelet transform and daily data of price index of the Tehran Stock Exchange (TEPIX) and OPEC oil price from 2009/03/25 to 2020/11/26 that sourced in OPEC and Tehran Stock Exchange sites. The stock market return calculate based on Equation (1):

$$R_t = \log\left(\frac{P_t}{p_{t-1}}\right) \tag{1}$$

where R and P are the return and price index of the Tehran Stock Exchange.

A wavelet transform is an effective tool for dealing with time series that have non-stationary characteristics. The coefficients extracted from the wavelets show part of the time series at different scales. A continuous transform function ($\mathcal{W}(u,s)$) is represented as:

$$W(u,s) = \int_{-\infty}^{+\infty} X(t)\Psi_{u,s}{}^{*}(t)\,d \tag{2}$$

where $X(t)$ represents the desired time series and $\Psi_{u,s}(t)$ is the function of a continuous base wavelet, s and u are the parameter scale and the time domain respectively, parameter scale controls the width of the wavelet and the time domain controls the location of the wavelet coefficients, $\Psi_{u,s}(t)$ generally defined as follows:

$$\Psi_{u,s}(t) = \frac{1}{\sqrt{s}}\Psi\left(\frac{t-u}{s}\right) \tag{3}$$

Where, the symbol * denotes a complex conjugate. There are numerous continuous base wavelet functions, each of them is used according to the characteristics of the purpose studies. In this research, the Morlet wavelet function is used, which is defined as follows:

$$\Psi(t) = \pi^{-1/4} e^{i\omega t} e^{-t^2/2} \tag{4}$$

In the above relation, $i = \sqrt{-1}$ is an imaginary number, and ω is the central frequency. In experimental work, the size ω is considered 6, which provides a good balance between frequency localization and time, therefore it offers a better ability to analyze wavelets.

In dynamic analysis between two variables, attention to wavelet coherence and the phase difference is important and necessary. Wavelet coherence is calculated based on the spectrum between the wavelet and the auto-wavelet spectra:

$$R^2(u,s) = \frac{\left|S(S^{-1}\mathcal{W}_{x,y}(u,s))\right|^2}{(S(S^{-1}|\mathcal{W}_x(u,s)|^2))(S(S^{-1}\left|\mathcal{W}_y(u,s)\right|^2))} \quad (5)$$

Where S is a smooth operator, and $\mathcal{W}_{x,y}(u,s)$ is a cross- wavelet that calculated as:

$$\mathcal{W}_{x,y}(u,s) = \mathcal{W}_x(u,s).\widetilde{\mathcal{W}_y}(u,s) \quad (6)$$

$\mathcal{W}_x(u,s)$ and $\widetilde{\mathcal{W}_y}(u,s)$ are wavelet transfer functions that are extracted from the time-series data of the variable x and y, respectively; the symbol ~ indicates the complex conjugate. Since the correlation between the two variables is shown in terms of quadratic power, it is not possible to comment on whether it is positive or negative. Therefore, the phase difference tool is used to diagnose this issue, which explains the positive and negative relationship, as well as the regression or progress of the variables. The phase difference between the two variables is shown as:

$$\Phi_{x,y(u,S)} = tan^{-1}\left(\frac{\Im\{S\left(S^{-1}\mathcal{W}_{x,y}(u,s)\right)\}}{\Re\{\left(S(S^{-1}|\mathcal{W}_x(u,s)|^2)\right)\}}\right) \quad (7)$$

Where $\Im$ and $\Re$ show the imaginary and real parts of the wavelet transmission, respectively. The results of phase difference and coherence are shown as vectors in the wavelet correlation diagram.

3. Results and Discussion

In the appendix section, Figures 1 and 2 present the continuous wavelet power spectrum of the oil prices and return of the stock market. The horizontal axis shows the time; number 500 indicates the 500th day from the beginning of the analysis period. The vertical axis on the left represents scale and period; by moving from top to bottom, scales 1 to 16, 16 to 64, and 64 and later show the short-term, the medium-term, and long-term, respectively. Also, the vertical colored column next to the graph displays the wavelet power spectrum. According to Figure 1, the highest wavelet power, on a scale of 0 to 16, relates to 2009 -2012, 2014- 2016, and 2018 - 2020. On a scale of 16 to 64, the highest wavelet power of oil price includes 2010 – 2011, 2014, 2016, and 2019. On a scale of 64 to 256, the highest wavelet power of oil prices relates to 2011- 2012, 2014 - 2015, and 2018 - 2019. In Figure 2, the highest wavelet power of stock market returns, on a

scale of 0 to 64, relates to during 2018 to 2020. On a scale up to 64, the high power wavelet of stock market returns associate with the period from late 2011 to 2020. To investigate the co-movement between stock market returns and oil prices used the wavelet approach. Figure 1 shows the results of estimated wavelet coherency and the phase differences between the two variables.

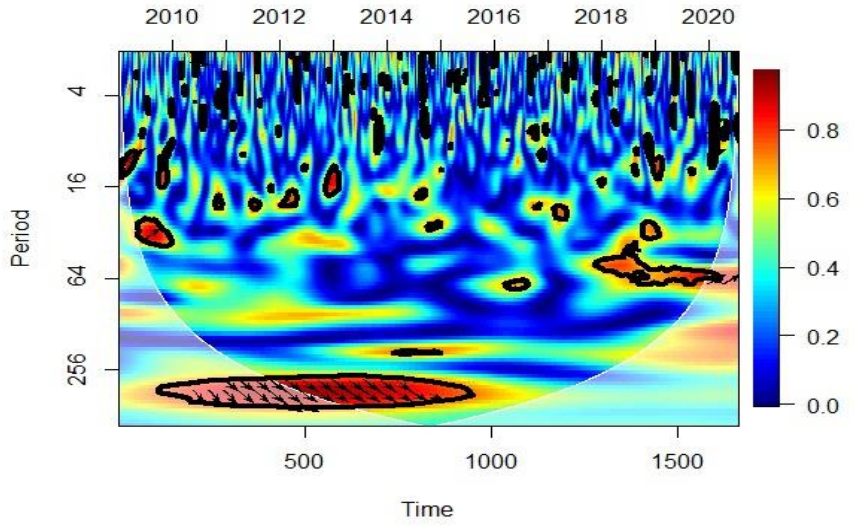

Figure 1: Wavelet Coherence between oil prices and stock market return

According to Figure 1, there are three components of scale, time, and wavelet correlation. The horizontal axis shows the time; the vertical axis on the left represents the scale of the period, and the vertical colored column next to the graph displays the wavelet correlation. Red color indicates a correlation of degree one, and blue color indicates a correlation of degree zero. In areas restricted by the bold black line, there is a correlation (co-movement) between two variables at a significance level of 5% obtained by the Monte Carlo simulation. In time series analysis, random values replace with actual values obtained due to the Wavelet moment oscillation. That is known as the edge effect leading to oblique conversion errors. The oblique errors rise by the increase in the transform of scale. Areas of the spectrum where the edge effect has peaked are named the cone of influence. In the edge regions, findings of the time-scale of the wavelet converter are unreliable. So, it is necessary to be careful in analyzing the results. These areas show in the figure by conical white lines are not easily interpreted and justified. The arrows in Figure 1 indicate a fuzzy difference. When the arrows point rightward, two variables are in phase. If the arrows point right-down, variable one leading variable two, and variable two leading variables one if arrows point right-

up. When the arrows point leftward, two variables are out of phase. Variable one leading variable two if the arrows point left- up, in contrary, variable two leading variables one if the arrows point left - down.

The research findings show that during the selected period, there is a positive correlation between oil price and stock market return; in most periods, in such a way that the significant correlation between oil price and stock market returns is more than 0.8. During the period of 2009 to 2015, only on a scale of 0 to 4 days, two variables in 2010 are in phase, and oil price is the leading stock market returns. Up to 256 days, from late 2011 to mid- 2015, there exists a strong correlation between variables. According to the directions of arrows, in this period, both variables are in phase, and oil price is the leading and cause of the movements of stock market earnings. In other words, oil price plays the most role in changes in stock market earnings. From 2016 to 2020 and on a scale of 0-64 days, is observed a significant correlation between variables. Notwithstanding two variables have in-phase movement only in 2020, because the arrows in the figure are not diagonal at the mentioned time intervals, it is not significant to comment on the causation direction.

In the following, the results of the study are discussed. From 2009 to 2011, both variables have an upward trend. Due to OPEC members' commitment to reducing oil production, the devaluation of the dollar, rising global oil demand, and declining US commercial oil reserves, the oil price rose. Despite the decline in the price index of Tehran's shares market in the second half of 2008, the return of the Tehran Stock Exchange increased during 2009-2011. Notwithstanding the impact of oil price on the country's economy, the emergence of symptoms of stock market improvement, rising prices of raw materials, entry of included companies to assignment according to Article 44 of the constitution to the stock market, stagnation of housing market, increasing transparency and attraction People's trust in the stock market, and the variety of financing instruments are the most fundamental factors affecting the increase of Tehran Stock Exchange returns in 2009-2011. So, in this period, there is a significant correlation between oil price and stock market return. According to the results of coherence analysis, only from late 2011 to mid- 2015, the oil price is the leading factor of the stock market. In other words, the oil price is the most principal and fundamental factor affecting stock market profits. In this period, the investigation of the oil price and stock market return shows two different trends. One refers to a positive relationship and the other to a negative relation. During 2011 - 2013, the oil price rose sharply due to factors such as the complete and temporary shut-off of the Libyan oil supply, unprecedented snow in Europe, devaluation of the dollar against the Euro, Middle East tensions, reduction in Iranian oil exports because of sanctions. The gap between the official and informal exchange rates widened following the imposition of oil sanctions and rising oil prices. During this period, the gold price, housing market revenues, and inflation experienced an upward trend. Also, the return of the stock market increased due to the reflection of inflation and the rise

of the nominal value of the dollar in the financial statements of companies. In 2015 and 2016, oil prices fell sharply. The excess oil supply in world markets, increase in oil production and unconventional oil supply, growth of production and storage of crude oil in the United States, reduction of global economic growth, the rising value of the dollar against the Euro, the easing of tensions in Iran-West relations, and the eventual lifting of oil sanctions against Iran are the main reasons for the declining in oil prices. In this period, the gap between the formal and the informal exchange rate narrowed due to the country's political upheavals at the international level, the conducting nuclear negotiations, and the lifting of oil sanctions. Thus, the informal exchange rate was relatively stable. Despite the increase in housing market revenues, the gold price declined during this period. The stock market also stagnated due to a fall in the gold price and a falling global oil price. In late 2015, the price index of the stock market rapidly grew due to the nuclear agreement with the world powers (Barjam) and the optimism of market participants for the future conditions of the economy. In addition to mentioned reasons, other factors such as lower bank interest rates, government support for the automotive industry, lower petrochemical feed prices, and the emergence of financialization phenomena contributed to increased stock market returns. With the reduction in bank interest rates from 20% to 18%, investors' attention drew to investing in the stock market. The decline in the price of petrochemical feed led to a decrease in the cost of petrochemical products and, consequently, a rise in the income of petrochemical companies and the share market returns. In 2015, while Iran experienced economic growth of -1.5, the value-added of the financial sector grew by 0.8 percent. Accompanied by the economic recession and shrinking country real income, economic agents increasingly turned to investment and activity in the financial markets to compensate for the reduction in income and access to other sources of income. Following financial economics, this phenomenon refers to as financialization. Also ،the stock market returns increased due to the growth of parallel markets and financialization. In 2016 the stock market stagnated. An increase in market risk as a result of reduction of stock liquidity, weakening demand side of the market shares due to problems of debt instruments, the positive expectations adjustment of market participants towards the Barjam agreement, and the US presidential election are the main factors that cause stagnation in the capital market in this year. The shares market return faced an upward trend again in 2017. The most important reasons for the increase of stock market return in 2017 are the rising oil price, increasing base metals prices, declining interest rates on bank deposits, and increasing exchange rates (Dollar), especially in the late of this year. From 2018 to 2020, stock market return increased due to the US withdrawal from Barjam, the sharp rise in the exchange rate, and the increase in the oil price. With the United States' withdrawal from the UN Security Council, the exchange rate and the gold price increased sharply in 2018. Accordingly, along with the growth of the exchange rate and the gold price, the stock market also experienced an upward trend until mid- 2020. So, between

2018 and 2020, there is a positive correlation between the shares market return and oil price.

4. Conclusion

Iran's economy is a single-product and oil-dependent economy in which the oil industry is a principal source of foreign exchange, revenue generation, and government funding. As a result, there is a strong relationship between changes in oil prices and macroeconomic variables, including the capital market. Over the past decade, the Tehran Stock Exchange is a substantial part of the capital market, which has received the public attention of small investors and firms. Therefore, it is necessary to study the impact of changes in oil prices on stock market returns. Given that Iran is one of the most important OPEC countries, the present paper investigated the relationship between OPEC oil prices and the Tehran Stock Exchange returns using the wavelet coherency method. To calculate the wavelet coherency and correlation between variables applied daily time-series data from 2009/03/25 to 2020/11/26, and Morlet wavelet that is wavelet continues to transform. According to findings, there is a positive correlation between oil prices and stock market returns; in most periods, the significant correlation between oil prices and stock market returns is more than 0.8. A comparison of the annual period shows that the oil prices and stock market returns are in phase from 2009 to 2011, and there exists a positive relationship between them. From 2011 to 2015, both variables are in phase, and oil prices are the leading factor in the stock market; In other words, oil prices are the most principal and fundamental factor affecting stock market earnings. During the period 2015 to 2020, both variables are in phase. But in this period, co-movements of oil prices and stock market returns not observed. The non-causal effect of oil prices on stock market earnings sometimes does not mean that oil prices do not affect the stock market. Rather, as mentioned, in most periods, oil prices and stock market returns are in phase. Factors such as imposing economic sanctions on Iran such as oil sanctions, fluctuations in the value of the dollar, volatilities in oil prices, changes in global demand for exports and imports from Iran, privatization, increasing the gap between the official and the market exchange rate, financial markets shocks, Middle East price tensions and the financing process affected the relationship between the stock market returns and oil price.

References

Abbasinejad, H., & Ebrahimi, S. (2014). The impact of oil shocks on the Tehran Stock Exchange's return. *Quarterly Journal of Economic Research and Policies*, 21(68), 83-108.

Abid, F., & Kaffel, B. (2018). "Time–frequency wavelet analysis of the interrelationship between the global macro assets and the fear indexes". Physica A: Statistical Mechanics and its Applications, 490(C), 1028-1045.

Alamgir, F., & Bin Amin, S. (2021). The nexus between oil price and stock market: Evidence from South Asia. *Journal of Energy Reports*, 7, 693-703.

Apergis, N., & Miller, S. M. (2009). Do structural oil-market shocks affect stock prices? *Journal of Energy Economics*, 31,569–75.

Arouri, M., E., H., & Nguyen, K. D. (2010). Oil prices, stock markets, and portfolio investment: Evidence from sector analysis in Europe over the last decade, *Journal of Energy Policy*, 38(8), 4528- 4539.

Awan, T., M., Khan, M., S., Ul Haq, I., & Kazmi, S. (2021). Oil and stock markets volatility during pandemic times: a review of G7 countries. *Journal of Green Finance*, 3(1), 15-27. doi: 10.3934/GF.2021002

Backus, S., B., & Crucini, M., J. (2000). Oil prices and the terms of trade. *Journal of International Economics*. 50, 185-213.

Balcilar, M., & Ozdemir, Z., A. (2013). The causal nexus between oil prices and equity market in the U.S.: A regime switching model, *Energy Economics*, 39: 271–282.

Bernanke, S., B., Gertler, M., & Watson, M. (1997). Systematic monetary policy and the effects of oil price shocks. *Brookings Papers on Economic Activity*, 1, 91-148.

Bernanke, B., S. (2006). *Energy and the Economy. Speech to the Economic Club of Chicago*. https://www.federalreserve.gov/newsevents/speech/bernanke20060615a.htm.

Bordbar, N., & Heidari, E. (2017). The effect of world oil price fluctuations on the return of the energy intensive industries stock in Iran. *Journal of Economic Modeling Research*, 7(27), 177-205.

Botshekan, M., H., & Mohseni, H. (2018). Investigation volatility spillovers between oil market and stock index return. *Journal of Investment Knowledge*, 7(25), 267-284.

Chien, F., Sadiq, M., Kamran, H., W., Nawaz, M., A., Hussain, M., S., & Raza, M. (2021). Co-movement of energy prices and stock market return: environmental wavelet nexus of COVID-19 pandemic from the USA, Europe, and China. *Environmental Science and Pollution Research*, Springer Online Published, https://doi.org/10.1007/s11356-021-12938-2.

Goupillaud, P., Grossman, A., & Morlet, J. (1984). "Cycle-octave and related transforms in seismic signal analysis". Journal of Geoexploration, 23(1), 85-102.

Ebrahimi, M., & Shokri, N. (2011). The Effect of Macroeconomic Variables on Stock Prices by Emphasizing the Role of Monetary Policy. *Quarterly Journal of Economical Modeling*, 5(13), 23-45.

Hamilton, J., D. (1983). Oil and the macroeconomy since World War II. *Journal of Political Economy*, 91, 228-248.

Hamilton, J., D., & Herrera, A., M. (2004). Oil shocks and aggregate macroeconomic behavior: the role of monetary policy. *Journal of Money, Credit and Banking*, 36, 265-286.

Hossyni Nasab, E., Khezri, M and Rasouli, A. (2011). The effect of oil price fluctuations on the stock return in Tehran Stock Exchange: wavelet analysis and Markov Switching. *Quarterly Energy Economics Review*, 8(29), 31-60.

Huang, D., R., Masulis, R., W., & Stoll, H. (1996). Energy shocks and financial markets. *Journal of Futures Markets*, 16(1), 1-27.

Jones, C., Kaul, G., (1996). Oil and Stock Markets. *Journal of Finance*, 51, 453–491.

Keshavarz H., Gh., & Maanavi, S. H. (2008). Stock Market and Exchange Rates Interactions concerning Oil Shocks. *Iranian Journal of Economic Research*, 12(37), 55-177.

Miller, J., I., & Ratti, R. A. (2009). Crude oil and stock markets: Stability, instability, and bubbles. *Energy Economics*, 31, 559–568.

Mohanty, S., K., & Nandha, M. (2011). Oil risk exposure: the case of the US oil and gas sector. *Financial Review*, 46(1), 165-191.

Papapetrou, E. (2001). Oil price shocks, stock market, economic activity, and employment in Greece. *Energy Economics*, 23 (5), 511–532.

Sadeghi shahdani, M., & Mohseni, H. (2013). The effect of oil price on stock market returns Evidence from oil-exporting Middle East countries. *Quarterly Journal of Energy Policy and Planning Research*, 0(3), 1-16.

Sadorsky, P. (1999). Oil price shocks and stock market activity. *Journal of Energy Economics*, 21(5), 449–69.

Saghafi, A., & Ghanbarian, R. (2015). The Dynamic Relationship between the Oil Price and the Capital Market Indices in Iranian Economy, *Economic Modeling Research*, 5 (20):193-216.

Seifipour, R., Mehrabian, A., & Hoseinpour, B. (2019). Synchronization of oil price and stock index with business cycle: Based on the Markov Switching Approach, *Quarterly Journal of Quantitative Economics*, 16(2): 103-124.

Shahbazi, K., Rezaei, E., & Salehi, Y. (2013). The impact of oil price shocks on the stock returns of Tehran Stock Exchange (TSE). *Financial Knowledge of securities An*alysis, 6(2), 125-136.

Shirinbakhsh, Sh., Bazazan, F., & Zareei, M. (2015). Evaluation of oil price shocks on stock market price, *Journal of Asset Management and financing*, 3(2), 15-32.

Sukcharoen, K., Zohrabyan, T., Leatham, D., Wu, X. (2014). Interdependence of oil prices and stock market indices: A copula approach. *Journal of Energy Economic*s, 44, 331–339.

Zaroki, Sh., Motameni, M., & Fathollahzadeh, A. (2018). The effect of the global oil price on the value of the petrochemical industry in Iran with the NARDL approach. *Journal of Iranian Energy Economics*, 7(27), 101-132.

Appendix

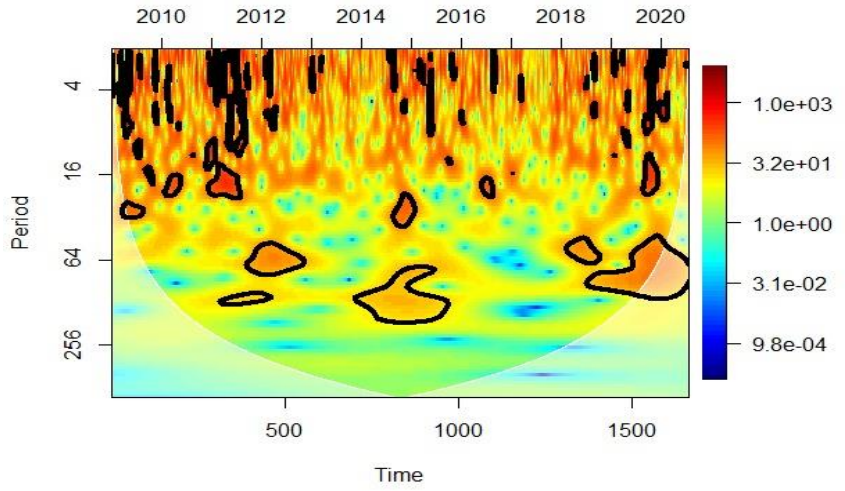

Fig. 1. Continuous Wavelet Power Spectrum of Oil Prices

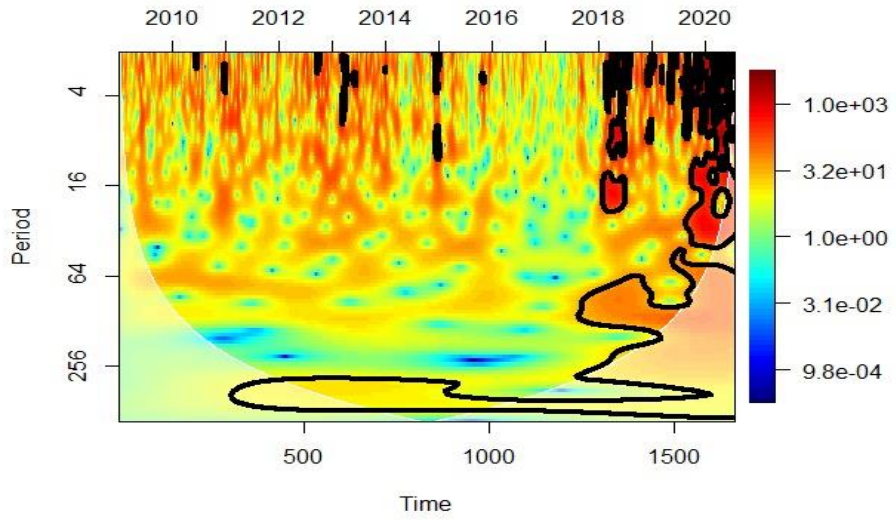

Fig. 2. Continuous Wavelet Power Spectrum of Stock Market

فصلنامه علمی مطالعات اقتصادیِ کاربردی ایران

سال دهم، شمارهٔ ۳۸، تابستان ۱۴۰۰

صفحات: ۶۸-۵۵

DOI: 10.22084/AES.2021.24350.3303

(مقاله پژوهشی)

هم‌حرکتی بین قیمت نفت و بازده بازار سهام ایران: رویکرد تجزیه و تحلیل موجک

محمدحسن فطرس[۱]

رضا معبودی[۲*]

تاریخ دریافت: ۱۴۰۰/۰۳/۰۸ تاریخ پذیرش: ۱۴۰۰/۰۳/۲۹

چکیده

در اقتصاد ایران بخش نفت از جایگاه قابل توجهی برخوردار است؛ به طوری که تغییرات قیمت نفت، بخش‌ها و بازارهای مختلف اقتصادی از جمله بازار سهام را تحت تاثیر قرار می‌دهد. بازار سهام از بازارهای مهم مالی است که به‌صورت بالقوه می‌تواند در شکل یک مجرای کارآ پس‌انداز و نقدینگی‌های سرگردان کشور را جذب و با تبدیل آن به سرمایه‌گذاری، رشد و توسعه اقتصادی را بهبود بخشد. بنابراین بررسی ارتباط بین قیمت نفت و عایدی بازار سهام کشور مهم و ضروری است. با توجه به اهمیت موضوع، هدف پژوهش حاضر بررسی هم‌حرکتی بین قیمت نفت اوپک و عایدی بازار بورس تهران است. برای تجزیه و تحلیل ارتباط بین دو متغیر از رویکرد همدوسی موجک و داده‌های روزانه طی دوره ۲۰۰۹-۲۰۲۱ استفاده شده است. یافته‌ها نشان می‌دهند بین قیمت نفت و عایدی بازار سهام رابطه مثبتی وجود دارد. تحلیل داده‌ها در مقیاس زمانی سالانه حاکی است طی دوره ۲۰۱۱ - ۲۰۰۹ قیمت نفت و عایدی بازار سهام هم فاز هستند و رابطه مثبتی بین آنها مشاهده می‌شود؛ از دسامبر ۲۰۱۱ تا آگوست ۲۰۱۵ هر دو متغیر هم فاز هستند و قیمت نفت عامل حرکت بازار سهام است. در دوره زمانی ۲۰۱۵ تا ۲۰۲۱ هر دو متغیر هم فاز هستند، اما همدوسی بین قیمت نفت و بازده بازار سهام مشاهده نمی‌شود.

کلید واژه‌ها: قیمت نفت، عایدی بازار سهام تهران، روش تجزیه و تحلیل موجک، هم‌دوسی.

طبقه‌بندی JEL: Q_{41}، G_{14}، E_{32}.

---

۱. استاد گروه اقتصاد، دانشکدهٔ علوم اقتصادی و اجتماعی، دانشگاه بوعلی‌سینا، همدان، ایران

Email: fotros1950@yahoo.com

۲. استادیار گروه اقتصاد، دانشکدهٔ علوم انسانی، دانشگاه آیت الله بروجردی، بروجرد، ایران (*نویسندهٔ مسئول)

Email: maaboudi@abru.ac.ir