



The contagion effect of international crude oil price fluctuations on Chinese stock market investor sentiment



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HIGHLIGHTS

- Chinese stock market investor sentiment index is proposed.
- Oil price fluctuations significantly Granger cause stock market investor sentiment.
- Crude oil price has negative contagion effects on stock market investor sentiment.
- Contagion delay of oil price fluctuation on stock investor sentiment is 8 months.

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ABSTRACT

Given the close contact between international financial markets, the contagion effect across markets is becoming increasingly obvious. In this paper, which uses principal component analysis to build a Chinese stock market investor sentiment index and further applies a structural vector autoregression (SVAR) model, we analyze the contagion effect of international crude oil price fluctuations on Chinese stock market investor sentiment. The results show that international crude oil price fluctuations significantly Granger cause Chinese stock market investor sentiment; in the long term, if the international crude oil price fluctuates by 1%, stock market sentiment will negatively fluctuate 3.9400%. From the perspective of short-term efficacy, if the international crude oil price fluctuates by 1%, stock market investor sentiment in the same period will negatively fluctuate 1.0223%. International crude oil prices made a greater early contribution to investor sentiment and showed a rapid growth trend, with a contribution of 2.8076% in the first period and 8.1955% in the second. The growth rate then slows and eventually stabilizes at the 25% level; the average contagion delay for international crude oil price fluctuation to affect investor sentiment is 8 months.

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1. Introduction

Oil has always been known as the “blood of industry”. As the upstream raw material of industrial production, oil has been playing an irreplaceable role. To meet the huge demand from oil consumption, countries worldwide typically import large quantities of crude oil. In 2015, for example, the United States imported 3.66 billion tons of crude oil, China 3.36 million tons, India 1.95 million tons, Japan 1.68 million tons, and so on. Oil price fluctuations affect a country’s economic development, social stability and the lives of its citizens. In view of the important role of oil in economic development, an increasing number of domestic and international scholars have been studying the international crude

oil price. At present, international crude oil price analysis generally takes two perspectives: first, the oil price is treated as a dependent variable to explore the impact of supply and demand factors, political factors, futures markets and other independent variables; second, the oil price is treated as an independent variable to explore its impact on gross domestic product (GDP), the consumer price index (CPI) and the producer price index (PPI), along with the impact of inflation and other macroeconomic variables. As a barometer of the macroeconomy, the stock market is affected by international crude oil price fluctuations [1–4]. Some scholars have pointed out that there is a strong two-way volatility spillover effect between the crude oil market and the stock market [5]. As an important factor affecting investors’ decision, investor sentiment can effectively account for many issues in stock markets. Because these problems are difficult to explain using traditional economic theory, investor sentiment has also attracted the attention of many

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scholars [6–8]. Further research results show that there is a two-way Granger causality and two-way volatility spillovers between stock market returns and investor sentiment [9,8]. There are strong correlations between international crude oil price fluctuations and stock market, and so are stock market and investor sentiment. In this way, we wonder if there exist correlations between international crude oil price fluctuations and stock market investor sentiment? The descriptive analysis of the international crude oil price volatility and the stock market investor sentiment indicates that there is a correlation between them.

At present, the international literature on investor sentiment mainly focuses on studying the influence of investor sentiment on stock market volatility, earnings and forecasts. The literature on the relationship between international crude oil price fluctuations and the stock market mainly explores the impact and spillover effects of international crude oil price fluctuations on stock market returns, as shown in Table 1. There are few studies addressing the effect of international crude oil price fluctuations on the stock market from the perspective of investor sentiment; thus, this study offers some originality.

As China has “rich coal, poor oil, less gas” energy characteristics and is experiencing rapid economic growth, its demand for oil is increasing. To meet this demand, China continues to increase oil imports, which has led to an increase in China’s external oil dependency. In 2015, its dependence was projected to reach 60.6%. The importance of oil for China’s economic development is clear. Meanwhile, China is still in an “emerging plus transition” stage; many problems still exist in its stock market, such as a higher proportion of individual investors, immature investment philosophies, higher stock market turnover and the presence of a large speculative component. China’s market is also more prone to the “herding effect” and other excessive effects [10,11]. As raw material of industrial production, oil will have profound impacts on the oil-related downstream industries. Oil has not only the attributes of resources but also the attributes of financial. Especially with the improve-

ment of oil futures market and the use of petroleum derivatives, financial attributes of oil has become increasingly prominent, oil price fluctuations will have an impact on the real economy and virtual economy. Taking the Chinese market as an example, choosing the international crude oil price fluctuation as the independent variable, and the stock market investor sentiment as the dependent variable, this paper will explore the impact of international crude oil price fluctuations on investor sentiment in China’s stock market and provide a positive reference to allow China, along with other countries and regions, to minimize the risk of financial contagion and develop policies for stock market regulation. The method presented here is innovative because (1) at present, related domestic and foreign research mainly focuses on the influence of international crude oil price fluctuations on stock market volatility and returns, while this paper takes the perspective of investor sentiment to explore the relationship between international crude oil price fluctuations and China’s stock market investor sentiment, diverging from earlier research perspectives. Furthermore, (2) this paper measures the impact of international crude oil price fluctuations on stock market investor sentiment in China in terms of long-term and short-term efficacy and contagion delay to reveal the contagion effect from international crude oil price fluctuations on investor sentiment in China’s stock market.

2. Literature review

Investors’ individual decision-making behavior will affect market judgment, which then causes sharp fluctuations in the stock market over the short term. It is sometimes difficult to explain this volatility from the traditional economic point of view. To address this phenomenon, behavioral finance introduced an assumption and refers to all investor expectations that cannot be explained by basic information as “investor sentiment”. Baker and Wurgler pointed out that investor sentiment is a belief based on investors’ expectations of an asset’s future cash flow and investment risk [6], although this belief does not reflect current facts. The researchers proposed the following proxy variables: discounts of closed-end funds, NYSE stock turnover rate, IPO numbers, IPO first-day average yield, the proportion of equity financing and dividend premiums, etc., and measured investor sentiment using these proxy variables. Using Baker and Wurgler’s index construction method as a reference, the Chinese scholars Yi and Mao integrated indicators that can reflect Chinese stock market investor sentiment and constructed a composite index to better measure it (their index is known as the CICI) [12]. At present, there are many applications of investor sentiment on the stock market, mainly focusing the influence of investor sentiment on stock returns [7,13–15], the forecast of stock returns [8,16,17], impact on stock market volatility [18], and the relationship between investor sentiment and different types of stock markets [6,19,20].

Energy, as an important factor of production, and the effects of energy price fluctuations on the economy and society naturally attract the attention of many scholars. For example, Zhang et al. analyzed the relationship between speculative trading and WTI crude oil futures price volatility [21,22]. Their study of price discovery and risk transfer effects on the crude oil and gasoline futures markets showed that the crude oil futures market has a greater price risk transfer ability, while the risk transfer effect between the crude oil and gasoline futures markets is not obvious. Ju et al. studied the macroeconomic impact of oil price shocks [23]; their results show that oil price shocks have a positive impact on GDP and exchange rates and a negative impact on the CPI. Ju et al. also proposed an incentive-oriented early warning system for predicting co-movements between oil price shocks and the macroeconomy [24]. Sun et al. identified regime shifts in the US

Table 1
Related research literature on investor sentiment and the relationship between international crude oil price fluctuations and the stock market.

| Research classification | Research topic | Representative research |
|---|---|---|
| Related research literature on investor sentiment | Impacts of investor sentiment on stock market returns | Corredor et al. [7], Ni et al. [13], He and Casey [14], Frugier [15] |
| | Forecasts of investor sentiment on stock market returns | Vozlyublenniaia [8], Kim et al. [16], Aissia [17] |
| | Impacts of investor sentiment on stock market volatility | Kumari et al. [18] |
| | Relationship between investor sentiment and different types of stock markets | Baker and Wurgler [6], Kadilli [19], Liston [20] |
| Related research literature on the relationship between international crude oil price fluctuations and the stock market | Impacts of international crude oil price fluctuations on stock market returns | Zhang and Wei [1], Awartani et al. [2], Bouri et al. [26], Ahmadi et al. [27], Diaz et al. [28], Nejad et al. [29] |
| | Spillover effects of international crude oil price fluctuations on the stock market | Chang et al. [3], Broadstock and Filis [4], Kang et al. [32], Du and He [5], Khalfaoui et al. [33], Ewing and Malik [34], Liu et al. [35] |
| | Interdependence or contagion relationship between international crude oil prices and the stock market | Wen et al. [36], Zhu et al. [37], Chen and Lv [38] |

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