

Technical trading on the US natural gas futures market: the dry wood waiting the spark ?

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Overview

Technical analysis is a broad set of tools which aims to measure the market sentiment. It assumes market movements are not random but they follow patterns and trends. There are two stake, identifying the current trend and determining if it will keep on. It is why we say the strategies based upon technical analysis are «trend-following». We notice the «Tinkerbell effect» of the strategies. Their effects exist because traders believe it. If traders buy when the price is rising, price will be keeping on increasing and vice-versa. The trend-following strategies contribute to volatility and might generate bubble patterns. They engage in positive feedback trading which is a perpetuation thus the price can vary irrespective of the fundamental value of the asset (Bradford de Long et al., 1990). Thus, the self-fulfilling prophecy is activated. The trend is your friend, until it ends. Richard Dennis lost \$50 millions during the 1987 crisis. The performance of trend-following strategies remains a highly controversial issue. The issue about their profitability has not been solved. Beyond the issue profitability, there is an other question. What is their influence on asset pricing ? We would like to raise the debate about the consequences of trend-following strategies on price distortion. The anti-bubble side says only fundamentals plays a role. Natural gas is concerned by this issue. It is easy to find content about the advantages of trend-following strategies (Dart, 2017). This energy is particularly important in the US because it represents 30% of the input for the production of electricity. The debate has been very heated after the Aramant failure in 2006. A US senate report pointed to «excessive speculation» (Levin and Coleman 2007). The wide amount of contracts owned by Aramant raised the issue of market destabilization:

Aramant held as many as 100,000 natural gas contracts in a single month, representing 1 trillion cubic feet of natural gas, or 5% of the natural gas used in the entire United States in a year. At times Aramant controlled 40% of all of the outstanding contracts on NYMEX for natural gas in the winter season (October 2006 through March 2007), including as much as 75% of the outstanding contracts to deliver natural gas in November 2006.

According to the senate report, the large positions and trades of Aramant generated variations of the spot and futures prices. Aramant long positions on winter contracts increased their prices. Thus, the winter-summer spread rose sharply. It lead traders with opposite positions to undo their positions what is called «short covering». For example, MotherRock was forced to cease operations following too expensive margin calls. When Aramant collapsed, it came back to the level before. Moreover, the authors say it increased the hedging costs for commercial traders buying natural gas for winter. Thus, it inflated the heating bills of residential users. Aramant used the «Enron loophole» of the Commodity Futures Modernization Act (CFMA) of 2000 which let electronic markets like ICE non regulated by the CFTC. Therefore, Aramant was able to circumvent the limit positions enforced by the CFTC by moving its positions from NYMEX to ICE. This loophole was closed by the Food, Conservation, and Energy Act of 2008.

This example looks similar to a situation of rational destabilizing speculation (Tokic, 2011). Rational speculators taking large positions generate a huge variation of prices. If trend-followers are active on the market, we can wonder if they can exacerbate the trend which would increase volatility. Moreover, it forces contrarians to give up. Thus, they do short covering which is a kind of «forced trend-following trades». Thus, it contributes to inflate prices furthermore. According to Tokic (2011), a destabilizing rational speculator impulses a trend which is exacerbated by trend-followers. Then, it induces short covering. The key factor in this theory for the take-off of a bubble is the positive feedback trading.

Our aim is to test if trend-followers creates a positive feedback on the natural gas daily futures price from past values. If it is the case, it means that the conditions for the emergence of a bubble are met.

Methods

First, we discuss the literature on the topic. Second, we present the model. We add trend-followers in Ekeland et al. (2016) which is a dynamic model of commodity futures market with storage. We show the possibility of an informational effect offsetting the cost effect (Socin and Xiong, 2015). It is when the commodity demand increases with the spot price because it is interpreted as a barometer of the economy. If it happens, the feedback of the futures price on the spot price is magnified. Therefore, when the futures price rises, the spot price increases even more which reduces the basis and thus the storage level. A bubble can happen without an increasing storage. Then, we present the data and we estimate the parameters of the model. We find a significant positive feedback trading and a magnified feedback from the futures price to the spot price of the US natural gas market between the end of 2008 and 2015. It means the conditions for a bubble were met even after the post 2008-spike period.

Results

There is a positive coefficient of autogression for the one-day lagged futures price. It is consistent with the existence of trend-followers. Nonetheless, there is no significant coefficient for a momentum at two days or one week. Moreover, the coefficient of the sensitivity of the spot price to the futures price is greater than one significantly. It is consistent with an informational effect offsetting the cost effect and an over-feedback from futures price to spot price.

Conclusions

To conclude, we extended the model of Ekeland et al. (2017) to include trend-followers. We estimated a linear version of it including trend-followers on the Henry Hub and Nymex, the US gas natural physical and futures markets from September 2008 to September 2015. We find mixed evidence. First, the feedback effect from the futures market to the spot market is confirmed with an over-feedback from futures price to spot price. It implies a bubble can arise without an increasing of the level inventories. We does not find significant results for the hedging pressure in the equations estimated. The results for the estimation of the parameters of the futures equations show a dominating role of speculation for weekly variations on the Henry Hub and Nymex from September 2008 to September 2015. The autocorrelation is symptomatic of the existence of a positive feedback trading. Nonetheless, we do not identify momentums. It is consistent with an underlying influence of the trend-followers on the US natural Gas futures market. Therefore, the conditions of the take-off of a bubble still existed in the post 2008-spike period. For future research, other studies should be done on other markets to compare the role of the hedging pressure and the role of the different kinds of speculation. We can detect preliminary conditions to bubble but not the spark.

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