

Reflections and Conclusions on Feedback Models

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Abstract. This article summarized Robert J. Shiller's article 'From Efficient Markets Theory to Behavioral Finance' and combined my own thoughts and examples from today's society to help readers understand the feedback model. I carefully analyzed Shiller's article and his explanation of feedback models is very detailed and thorough. But since his paper was written in 2013, I think the examples he used are relatively old and not helpful to contemporary young readers, so I have combined examples from today's society to give a more comprehensive and understandable explanation of the feedback model.

Keywords: Utility Market Theory, Finance, Feedback Models.

1. The main idea of Shiller's view of Feedback Model

Feedback model is a price-to-price feedback theory, people are attracted to investors who are successful because of speculative price increases which will promote word-of-mouth enthusiasm, and people will expect the further price increase. The speculative bubble will be produced if the feedback is not interrupted. The price will not grow endlessly, the price is high only because people have high expectations for the price, when the price is high enough, the bubble will burst, and then the price will fall. The feedback could also lead to negative bubble, and the price will fall until the unsustainably low level.

The famous tulipmania in Holland in 1630s is a typical example of speculative bubble of feedback model, more and more people were joining the tulip cultivation industry because they envy those who profit from it and want a piece of the pie. One day some of the smarter or more timid people started to drop out. As soon as this sign was detected, the sell-off turned into panic, and the price swooped down from the cliff. Whole economic life in the Holland collapsed when crazy prices finally collapsed.

It has been speculated that feedback models, which often reproduce on a smaller scale and play an important role in everyday life, may be a significant source of much of the unexplained randomness in financial market prices.

While feedback theories are hard to find in economics and finance textbooks, some experimental evidence supports the existence of such a theory. The psychologists Andressen and Kraus found that prices tend to change over time, and people trade based on past prices. Moreover, Marimon, Spear and Sunder found that repeated bubbles were generated if subjects formed expectations of bubbles based on past experiences.

The existence of this feedback is also supported by research in cognitive psychology, which suggests that human judgments about the probability of future events display systematic biases. People try to make predictions by finding the closest match to a past pattern without paying attention to the observed probability of matching patterns. The psychological principle of "biased self-attribution" shown by Daniel, Hirschleifer and Subramanyam described that people attribute their successes to their own abilities and their failures to bad luck which also promote the feedback.

The evidence from natural experiments should be more convincing than the lab experiment to support the feedback model, and the Ponzi schemes can be seen as this kind of natural experiments.

There is a problem with feedback theories. These theories imply that speculative price changes are closely related to time, which is contrary to the randomness of stock prices. However, because there are many other factors that affect stock prices, the randomness of stock prices cannot be used against feedback theory.

2. My view of Feedback Model

In my opinion, feedback theory is very relevant to life and is very practical for some ordinary investors in real life. It seems to me that for many non-professional stock investors, the direction of information and the historical price of the stock can greatly influence whether an investor chooses to buy the stock. Information such as company financial reports, news, government policies, etc. will feed back some valuable information to investors. For example, the Russian-Ukrainian war that broke out some time ago caused the stop of Russia's oil supply, which clearly sent a strong message that oil stocks will skyrocket. But often for many investors, the timeliness and accuracy of the information they receive is often not guaranteed, because for companies and governments, they often only want to convey the information they want investors to see. I think this kind of information should be biased. The historical price trend of stocks is often one of the important factors for ordinary investors to judge whether a stock is worth buying. The excellent performance of a stock in the past will give current investors strong confidence. For example, Shopify's stock is currently at CAD519, but it once reached as high as CAD2139.82. When its price keeps falling, people will continue to think it is a good opportunity to buy bottoms and believe its stock price will return to its highs. Based on the examples above I think the feedback model is real. At the same time, I think feedback is a cycle. Investors will judge the value of a stock based on the historical price of the stock, and these behaviors will also feed back to the stock price and have an impact on it.

3. In what settings may the Feedback Model apply more strongly?

According to Shiller's description, feedback model will apply more strongly when speculative prices go up, some investors has succussed from this, increased attention and widespread perception that it is a money-making thing like the famous tulipmania event. The reason why under these settings it applies more strongly is when people receive a message that clearly tells you a way to make money, no one wants to miss it because no one thinks making money is a bad thing. Even a risk-hating person would want to do it. For example, when planting tulips becomes a highly profitable thing, more and more people will plant tulips. But this eventually leads to a speculative bubble, and the bubble bursts when prices get high enough. All in all, I think that feedback models are applied more strongly when the information that investors receive is accurate or when the investors themselves see it as useful because they see this information as valuable and disseminate it to others. If the messages they receive are useless or unprofitable or unattractive, the feedback model will not apply. If a piece of information tells an investor what to do that will lose money it will apply to the feedback model more than a piece of worthless information, information that tells you negative information will transmit negative feedback, and negative information is also valuable in some ways that you can stop loss in time.

4. The real life example of Feedback Model

According to the example of famous tulipmania in Holland in the 1630s, I think the feedback model works well for some premium products like tulips back in the day. At the same time, I think these premium products should be very profitable in the secondary market and have arbitrage opportunities for investors who have not yet joined the market. For young people like me who love sneaker culture, I think limited edition sneakers are closely related to the feedback model. As the economy develops and incomes rise, more and more money is available to people to spend on hobbies. For many young people, owning a pair of limited-edition sneakers such as Yeezy and Air Jordan has become their hobbies. For limited edition sneakers, it is almost impossible to buy the original price. When sneaker dealers resell them on the secondary market, the price of those shoes will be relatively high. But for many young people who love sneakers, they are also very willing to pay for the high prices of sneakers in the secondary market. They even think that these sneakers are originally worth so much money and because of the limited number, they think that the price of these shoes will goes up in the future. They see it as an investment and one of the reasons they buy a sneaker. Sneakers are

similar to tulips. Due to the limited number and unique shape of sneakers, many shoes' price will have room for appreciation in the future. When your friends tell you that a new pair of sneakers is going to skyrocket in the future, it's hard to resist the temptation and start stocking up on them.

References

- [1] Tegg-Quinn S, Bennett R J, Brennan-Jones C G, et al. Reflections and perceptions of chronic tinnitus during childhood and adolescence [J]. *International Journal of Pediatric Otorhinolaryngology*, 2020, 138(5):110258.
- [2] Son M, Lee Y, Chang H S. Toward Specular Removal from Natural Images Based on Statistical Reflection Models [J]. *IEEE Transactions on Image Processing*, 2020, PP(99):1-1.
- [3] Deng Z, Xiang Y, Kang Z. Build complementary models on human feedback for simulation to the real world [J]. *Knowledge-Based Systems*, 2021, 217(4):106854.