McGinley dynamic indicator and Tepix of Iran

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Abstract. This paper examines the impact of McGinley dynamic indicator on the total index of Iran Stock Exchange. The trend of the total index of Iran Stock Exchange is considered as a dynamic system. Two points are important here. The first point is that this indicator, using recursive relations, presents a very close and formulable approximation of the trend chart of the total index of Iran Stock Exchange. The next point is that the chaotic behaviors in the chart of the total index of the Iranian Stock Exchange have been leveled by using this indicator.

Keywords: Financial markets, McGinley dynamic indicator, Tepix of Iran
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1. Introduction

The foundation of stochastic finance is return independence, which is the key assumption in the random walk model. Real stock prices exhibit higher-order and nonlinear correlations, thus according to the ARCH and GARCH models, the classical approach to deal with this problem is to model the volatility parameter in the random walk model as a random process. This means that the price returns are in general not independent. The classical models are non-linear stochastic equations. Also, they are descriptive in nature and they could not provide quantitative links between return independence and trader actions. One of the best topics in this field has been considered by researchers is that how the returns generated by our price dynamical model are changing from positively correlated to uncorrelated and then to negatively correlated as the model parameters change.

Indicators in financial markets are in fact a kind of observer of financial markets as a dynamic system. The highly complex and volatile behavior of global financial markets increases the need for these indicators every day. Very important indicators such as RSI, MACD, MA, SMA, ... are some of these indicators that predict the future trend of a financial market as a dynamic system. The McGinley Dynamic is a little-known yet highly reliable indicator invented by John R. McGinley, a chartered market technician and former editor of the Market Technicians Association's Journal of Technical Analysis.

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Working within the context of moving averages throughout the 1990s, McGinley sought to invent a responsive indicator that would automatically adjust itself in relation to the speed of the market. His eponymous dynamic, first published in the Journal of Technical Analysis in 1997, is a 10-day simple and exponential moving average with a filter that smooths the data to avoid whipsaws. The McGinley Dynamic indicator is a type of moving average that was designed to track the market better than existing moving average indicators. It is a technical indicator that improves upon moving average lines by adjusting for shifts in market speed. This indicator solves the issue of varying market speeds by incorporating an automatic adjustment factor into its formula, which speeds (or slows) the indicator in trending, or ranging, markets. The McGinley Dynamic indicator improves upon conventional moving averages by minimizing price separations and volatile whipsaws so that price action is more accurately reflected. McGinley Dynamic Formula is:

$$MD_i = MD_{i-1} + \frac{Close - MD_{i-1}}{k \times N \times (\frac{Close}{MD_{i-1}})^4}.$$

Where:

(1) MD_i=Current McGinley Dynamic;
(2) Close=Closing price ;
(3) MD_{i-1}=Previous McGinley Dynamic;
(4) k=0.6 (Constant 60 percent of selected period N;
(5) N=Moving average period.

In fact, McGinley found that the moving averages were too often applied incorrectly. The period of the moving averages should be adjusted to the speed of the market changes. Another problem McGinley saw in the moving averages was that they are often too far separated from the prices. They should follow the price to give the right signals to open a position. To read more about the structure of indicators and how they work, we refer dear readers to references [1], [2], [3], [4] and [5].

2. Main results

Global financial markets today are known as highly complex dynamic systems. These markets have volatile movements and with these volatile movements they cause losses to traders. In fact, it is these fluctuations that cause bubbles in financial markets. These bubbles cause the real price of a financial market to never happen easily. Positive and negative price bubbles actually cause drastic changes in the price movements of a financial market. In this article, we intend to examine the trend of the total index of the Iranian Stock Exchange in the past two years by using McGinley dynamic indicator. Last year, the Iranian stock market experienced one of its biggest historical declines. But was this fall unpredictable? In fact, the indicators, that are based on the trend of the financial market, which in practice is a complex dynamic system, can predict the future of this financial market by putting together past information as a random process. The information that is examined in this article is the information of the total index of Iran Stock Exchange, the source of which is the site of the Iran Stock Exchange Organization. First, in Figure (1), we see the behavior of the indicator on the total index of Iran Stock Exchange. Sometimes an indicator on the chart of a financial trend can be very telling and useful. As can be seen in Figure (1), McGinley dynamic indicator, Expresses important points from the Iranian stock market process.

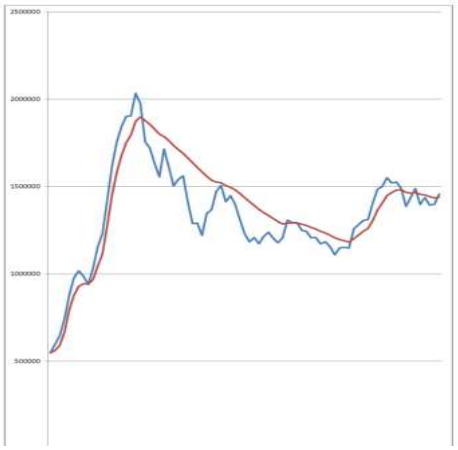

FIGURE 1. McGinley Dynamic Indicator and Tepix of Iran.

It can be seen that this indicator can practically act as a simulator of the Iranian stock market trend in the last two years. Also, this indicator has formalized the kind of chaotic movements of the Iranian stock market by eliminating minor oscillating movements. In a dynamic system, the existence of a formulation is very important. From the trading point of view, this indicator has both support and resistance properties. Whenever this indicator is located above the chart of the total index of the Iranian Stock Exchange, it has acted as a resistance of the trend. This can be clearly seen in Figure (1). Also, whenever this indicator is below the chart of the Iranian Stock Exchange index, it has acted as a supporter of the trend. In other words, whenever this indicator is at the bottom of the chart of the total index of Iran Stock Exchange, the trend of the stock market index is upward, and whenever this indicator is at the top of the chart of the total stock index of Iran, the trend of the stock market index is downward. But, what is important here in terms of discussing dynamic systems are two points. The first point is that this chart, using recursive relations, presents a very close and formulable approximation of the trend chart of the total index of Iran Stock Exchange. The next point is that the chaotic behaviors in the chart of the total index of the Iranian Stock Exchange have been leveled using this indicator.

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References

1. Colby and Meyers, *Encvclonedia of Technical Market Indicators*, Dow Jones, Irwin, 1988.
2. Dobson, Edward D., *Understanding Bollinger Bands*, Traders Press, 1994.
3. Kaufman, Perry J., *New Commodity Trading and stems and Meth*, John Wiley and Sons, 1987.
4. Lloyd, Humphrey, *The Modw Balance Svstem*, Windsor, 1976.
5. Savitzky, Golay, *Smoothing and Diffprrntiation of Data by SimplifYed Least Squares Procedures*, Analytical Chemistry, 101. 36, July 1964.