



Predicting Nifty 50 Movement Use of Advance Decline Ratio

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ABSTRACT

The stock market volatility stimulates the trading feelings of investors. The thrilling to predict stock market attracts attention of researchers and investors towards study of stock market indicators which can be useful to predicting stock market. But the question is can someone, somehow predict short term price of an individual stock? This paper attempts to do what many investors and mathematicians have tried to do for decades, and that is to make such predications. The past 12-months daily data of the year 2010 of Advance/Decline (A/D) ratio and daily closing price data of Nifty 50 index is collected and the regression analysis is used to know the relationship among the A/D ratio and Nifty. With the statistical software (Gretl) Durbin Watson and Autoregression is also applied to know the relationship between A/D ratio and Nifty 50.

Keywords : Stock Market Prediction, Advance Decline ratio, Durbin Watson

Introduction

The successful prediction of stock market generates profitable opportunities to earn decent profit on trading. The profitability of investing and trading in the stock market mainly depends on the accuracy in predictability. If any pattern or stock indicators developed which can consistently predict the trends of the dynamic stock market it would be magic key to earn wealth. But the stock markets are complex, nonlinear, and dynamic. The Random walk theory believes that there is no relationship between stock prices; they are independent to each other. But stock market expert, traders and academicians believe that they are reasonably predictable. There are two major types of analysis for predicting stock prices fundamental and technical. The fundamental analysis measures the intrinsic value of a particular stock by studying everything from the overall economy and industry conditions, to the financial condition and management of companies. Technical analysis looks for patterns and indicators on stock charts that will determine a stocks future performance¹. The AD ratio is one of the important factors which can use for predicting index movement.

Different indicators to predict market movement:- The following are the major indicators used in stock market to predict the market. But the focus of this paper is only on Advance Decline ratio.

90% Up volume- /Down volume Days (9-to-1), Advance-/Decline 20 Day Momentum, Advance-/ Decline Index Weekly, Advance-/ Decline Line Daily, Advance-/ Decline Ratio Daily, Call/Put Ratio Open Interest Equity Options, Call/Put Ratio Open Interest S&P 500, Call/Put Ratio S&P 500, High-/Low Index Weekly, Odd Lot Differential Index and Upside-/Downside Ratio Daily etc..

The market that experiences a trend toward either a decline or an advance is highly unlikely to reverse its movement immediately on the next trading day. The term decline represents a cumulative total of the number of stocks that

have fallen in price compared to their close on the previous trading day. Conversely, the term advances refers to a cumulative total of the number of stocks that have risen in price compared to their close on the previous trading day. If the price of a particular stock currently trades above its closing price from the previous trading day, this stock is considered part of the day's advances group.

Literatures Review

In the paper titled "Forecasting Movement of Stock Index Use Of Spread between E/P Ratio and Interest Rate Forecasting Movement of Stock Index" by Dr. Sathya Swaroop Debasish studies the usefulness of the E/P ratio as an indicator of future stock market conditions. He found that spread seems to have reasonably strong causal influence on return and the causal model helps achieving forecasts better than the random walk model². Rolph and Shen (1999) find that the 10th percentile of the historical values of the spreads produces a higher average return and a lower variance than that produced by simply buying and holding the stock market index⁸.

Fuller, in the paper titled "Return to E/P strategies" studied US market data for 18 years, started from the 4th quarter of 1973 to 3rd quarter of 1991. He found that high E/P ratio generates above normal return and low E/P ratio generate below normal return³. Campbell and Shiller (1998) investigate the relationship between the E/P ratio of the S&P 500 index and the general stock market outlook. From the data from 1872 to 1997 they find positive correlation between them⁹. In the paper titled "Forecasting Stock Market Prices" by David A Umstead, evaluate the causal relationships between stock prices and the economy. He found that while stock price Granger caused economic activity, no reverse causality was observed. He also found that the reason for causality relationship between stock market and economy is only due to forward looking nature of the stock market. He also concludes that GDP is one of the economic factors which impact stock prices⁴.

In the International Economic Review, 39(4), 885-905, study titled, "Answering the Skeptics: Yes, Standard Volatility Models Do Provide Accurate Forecast" recommended that ARCH and stochastic volatility models provide good volatility forecasts⁵. Dominique Gu'egan, Octavie Mbiakoup explain the possibility to use price index and exchange volume as leading indicators in the paper titled "Price Index and Trading Volume: Which one is the best to predict financial crisis?" They found the similarities in both trading volume and price index. They studied 1990s financial crisis using price index and conclude that price index could help in predicting financial crisis. It gives signal less than 6 months before its occurrence⁶. Majumdar and Hussain (2010) used neural network based model to predict the closing value of Nifty 50. They used trading days from 1st January 2000 to 31st December, 2009. They find 89% of accuracy in predicting the direction of the closing of Nifty 50 over a period of 4 years⁷.

Objective of the study:

- To study the relationship between the advance/decline ratio and Nifty 50 movement.
- To know whether advance/decline ratio as an indicator of market predictor is useful for predicting the index.

Research Methodology

This study examines the relationship between two variables, A/D ratio and closing of Nifty 50. If the relationship between variables supported by stationarity test it will be desirable. To know the data are stationary or not, Durbin Watson model may be used. And the basic assessment of the relationship between A/D ratio and closing of Nifty 50 may be calculated through appropriate correlation and regression analysis. The outcome other than ZERO tells that A/D ratio would have some impact on next day's movement of Nifty 50.

Durbin Watson model:

In statistics, the DurbinWatson statistic is a test statistic used to detect the presence of autocorrelation in the residuals from a regression analysis. The value of D always lies between 0 and 4. If the DurbinWatson statistic is substantially less than 2, there is evidence of positive serial correlation. Less than 1.0, there may be cause for alarm. When it is 2, there is no autocorrelation. And when it is 4, there is negative correlation.

Hypothesis:-

1. H0: There is no significant relationship between A/D ratio and closing of Nifty 50.
H1: There is significant relationship between A/D ratio and closing of Nifty 50.
2. H0: There is a presence of unit root (a=1-non stationary).
H1: There is no presence of unit root (a ≠ 1 stationary).

Data Collection

The study is based on secondary data. The daily S&P CNX Nifty 50 closing data and daily recorded A/D ratios are collected for the period of 4th January, 2010 to 31st December, 2010. Total 252 closing of Nifty and 252 A/D ratio data are collected from NSE's website.

Data Analysis

In order to examine relationship between A/D ratio and Nifty 50, correlation and regression analysis have been used. The collected data are analyzed through Autoregression test and Durbin Watson test to check randomness within data with the help of Gretel software.

Results And Discussions

Table 1: Regression Analysis

Multiple R	0.342541882
R Square	0.117334941
Adjusted R Square	0.113790102
Standard Error	0.964855429
Observations	251

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-0.004	0.0621	-0.06076	0.95	-0.1262	0.118703
X Variable 1	0.0005	8.604E-05	5.7532784	2.6E-08	0.000325	0.00066446

Here relatively very low value of R square 0.1173 i.e. 11% and relatively very high value of standard error of estimate i.e. 96% indicate that this regression model has fairly weak predictability. The ANOVA also conclude same results. The variable A/D ratio is not so significant with t value -0.06 and p value 0.95. The regression equation of line for month of Jan is $y = -0.06 + 0.0030x$. The probability of t ratio indicates there is no significant linear trend present in the data. So there is no significant relation between closing price and A/D ratio data. So we cannot predict closing of Nifty 50 from the A/D ratio. From the findings it can conclude that "1st null hypothesis is failed to reject."

Now to support above finding, the Autoregression test and Durbin Watson test is applied. It gives idea that data are stationary or not?

Results for the unit root test: -

Table 2: OLS, using observations 2010/01/05-2010/12/31 (T = 251)

Dependent variable: V1

	Coefficient	Std. Error	t-ratio	p-value
V2	0.000493943	8.4089e-05	5.8740	<0.00001 ***

Mean dependent var	0.068642	S.D. dependent var	1.024929
Sum squared resid	231.8090	S.E. of regression	0.962931
R-squared	0.121279	Adjusted R-squared	0.121279
F(1, 250)	34.50440	P-value(F)	1.35e-08
Log-likelihood	-346.1714	Akaike criterion	694.3428
Schwarz criterion	697.8683	Hannan-Quinn	695.7615
rho	0.102969	Durbin-Watson	1.789784

The above table shows the output for the autocorrelation model & as per output we can conclude that the p value is 1.35e-08 which is significant to prove that A/D ration is a fair predictor for predicting NIFTY 50 movement^E. Here the value of R² is 0.1213 which shows there is low positive impact of independent variable on the dependent variable NIFTY 50. But, the Durbin Watson index is 1.7898 which shows that data are not stationary.

Hence, we fail to reject the 2nd null hypothesis & data are non-stationary. So we need to convert this nonstationary data in to stationary to avoid spurious regression problem. The transformation method depends on whether the time series are difference stationary or trend stationary. We run difference stationary test, add 1 lag and run autoregression in Gretl. The following table shows the output of the same.

Table 3: Using observations 2010/01/06-2010/12/31 (T = 250) Dependent variable: V1

	Coefficient	Std. Error	t-ratio	p-value
V2	0.000551089	8.27114e-05	6.6628	<0.00001 ***

Statistics based on the rho-differenced data:

Mean dependent var	0.065423	S.D. dependent var	1.025713
Sum squared resid	228.1653	S.E. of regression	0.957249
R-squared	0.129264	Adjusted R-squared	0.129264
F(1, 249)	44.39281	P-value(F)	1.71e-10
rho	-0.005817	Durbin-Watson	2.010949

Table 3 shows the output for autoregression model after adding 1 lag. Durbin Watson value of 2 indicates that the data become stationary at 1 lag difference. The R Square value also increases from 12.12 to 12.92. Hence, it can be concluded that there is positive relationship between AD ratio and Nifty. But A/D ratio can not significantly use to estimate

Nifty movement.

Conclusion

In the regression analysis it is assumed that the other factors i.e. GDP, inflation, interest rate etc. remain constant and in this situation the regression analysis shows very low value of R square compared to standard error. So, there is very low significance between the closing price and the A/D ratio. So, it can be concluded that A/D ratio is not better predictor of closing price.

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