DEPENDENCY OF STOCK PRICE ON MARKET EQUILIBRIUM

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Abstract

The stocks are the assets of market. The economic theory of demand is applicable for resource allocation and asset pricing. Stock price of a company depends on so many intrinsic and extrinsic factors. Extrinsic factors include economy related indicators. Demand of a stock in market depends on both internal and external elements of the company.

Market equilibrium depends on demand and supply gap. Market equilibrium can be Pareto optimum under a set of sufficient conditions. Incompleteness of the market happens due to lack of information dissemination which results into market imperfection. Stock Market Efficiency influences the gap between demand and supply of stocks which coupled with other factors determines equilibrium price and transaction quantity. Consumers or traders make their investment decision based on the forecasting of equilibrium price of various stocks to compose their portfolios with an objective of optimum gain over a period.

In ideal situation, there is no gap between demand and supply when market equilibrium is reached. This research paper explores the nature of dependency of stock price on market equilibrium which is denoted by the extent of difference between demand and supply. The present research has found that change in stock price has a positive correlation with the gap between demand and supply. The changed price of stock is determined by the new equilibrium of market which is attained at an updated demand and supply level.

Keywords: asset price, law of demand, market efficiency, market equilibrium, stock market

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1. Introduction

Stock prices change due to market forces. Market forces influence supply and demand of the stock. Market dynamics, economic conditions and changes to economic policy tend to impact the supply and demand of stocks. Capital market plays an important role in the allocation of economic resources into productive activities of the economy, which are possible only if the securities traded in the markets are priced appropriately. An efficient capital market is an important component of a capitalist economy. In such a situation, prices are accurate signals for capital allocation for the ideal market scenario. Price of a stock depends on several variables. Both in terms of an understanding of the working of stock markets and in their performance and contribution of the development of a country's economy, stock market efficiency plays an important role. If the stock market is efficient, the prices will represent the intrinsic values of the stocks and in turn, the scarce savings will be optimally allocated to productive investment which is beneficial to both individual investors and the country economy.

In the context of asset price behavior and the pricing models, during the past two decades much time and effort have been devoted in the field of finance to investigate the behaviour of certain speculative prices such as those of securities and commodity futures. Research efforts have been directed, in particular, to study price behavior of common stocks or equity shares as they are popularly called in India with a view to understanding the underlying stochastic processes which determine the prices of these shares. Historically, there have been essentially two schools of thought concerning security valuation and the behaviour of share prices, viz., technical and fundamental analysis schools.

The present research focuses more on technical analysis. It explores the relationship of stock price with its demand in the market.

2. Literature review and research gap

The existing literatures, mainly on the fundamental factors on which asset or stock value should depend, have been reviewed here. Fama (1970) indicated that stock prices moved according to fundamentals. But empirical researches since then have raised doubts about this observation. Shiller (1981) observed stock prices to be more volatile than what would be reflected by economic movement. Blanchard and Watson (1982) showed that when the bubble is present, the proportional change in stock prices is an increasing function of time and, therefore, predictable; Fama and French (1988) in their research on permanent and temporary components of stock prices found

returns to possess large predictable components casting doubts about the efficiency of the stock market. Dwyer and Hafer (1990) tested the movement of stock prices in a cross-section of countries and observed no justification for either bubbles or the fundamentals in determining the stock prices. The studies of Froot and Obstfeld (1991) and Mishkin (1999), on intrinsic bubbles raised doubts about stock prices being determined by the fundamentals. Campbell (2000), in a review of the empirical literature, has discussed the existence of dynamic equilibrium in the USA stock market; however, Polemarchakis (1990), in a review of theory, had discussed the problems of existence of an efficient stock market equilibrium with incomplete markets and suggested information control as a possible solution to the problem. There have been a number of studies regarding efficiency for Indian stock markets. Research by Barua (1981), Sharma (1983), Gupta (1985) and others confirm weak form of market efficiency. For example, Sharma (1983) uses data of twenty three stocks listed in Bombay Stock Exchange (BSE) (whose index was subsequently labeled Sensex) between the period 1973 and 1978, and his inference confirms at least weak form of random walk applicable for the BSE during the period. There were also tests by Dixit (1986) and others, which primarily focuses on stock prices' relationship with dividends to test the role of fundamentals. Efficiency hypothesis was supported by these tests. But, Barua and Raghunathan (1990), Sundaram (1991), Obaidullah (1991), raise doubt about this efficiency hypothesis. For example, Barua and Raghunathan (1990) used 23 leading company stock prices enlisted in BSE. They estimated price-earning (P/E) ratio based on fundamentals and compared them with actual P/E data. The result indicated shares to be overvalued. Obaidullah (1991) used BSE data from 1979 to 1991 and found that stock price adjustment to release relevant information (fundamentals) is not in the right direction, implying the presence of undervalued and overvalued stocks in the market. Barman and Madhusoodan (1993) found that stock return do not exhibit efficiency in the shorter or medium term; though appear to be efficient over a longer run. Jegadeesh (1993, 1999, 2001) defined Momentum theory which states that there is substantial evidence that indicates that stocks that perform the best (worst) over a three to 12 month period tend to continue to perform well (poorly) over the subsequent three to 12 months. Sarkar (2014) studied market efficiency in Indian stock market in 2000 and beyond. Sarkar (2014) carried out empirical works on daily share price behavior of BSE's companies in India under the framework of efficient market theory. His study deals with stock market efficiency and discusses the panel of companies.

The earlier research work has not explored the dependency of stock price on quantity demanded. This present research has tried to address that gap.

3. Objective of the study and methodology

The objective of this study is to investigate the relation of change of price of stock with change of demand of the stock. The primary objective of present research is to assess the nature of dependency of stock price on the demand of the stock in market.

The data are collected from official website of Bombay Stock Exchange. Daily price and volume data are collected. The data also includes the daily closing, high, low and open values of the BSE sensex for the period 2016-2021. A company of BSE30 index is selected for this research to collect daily price and volume data for the period 2016-2021 from official website of BSE.

The statistical software SPSS and MS Excel are used for the data analysis along with other related software. Various statistical tests including the Artificial Neural Network and Linear Regression are used to test the collected data.

4. Results and discussion--

The following graph shows the pattern of price movement with respect to demand movement.

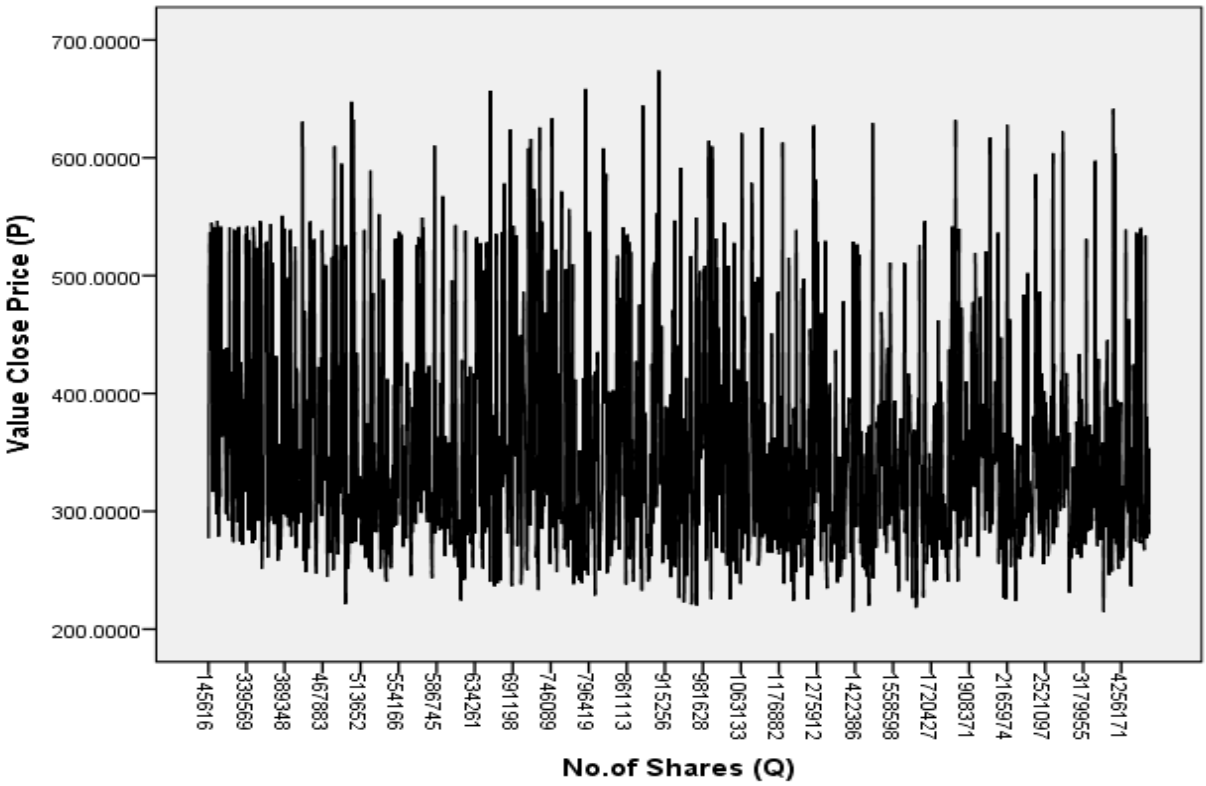

Fig. 1 Line Diagram: Stock Price vs. Demand

The following graph shows the pattern of price change movement with respect to demand change movement.

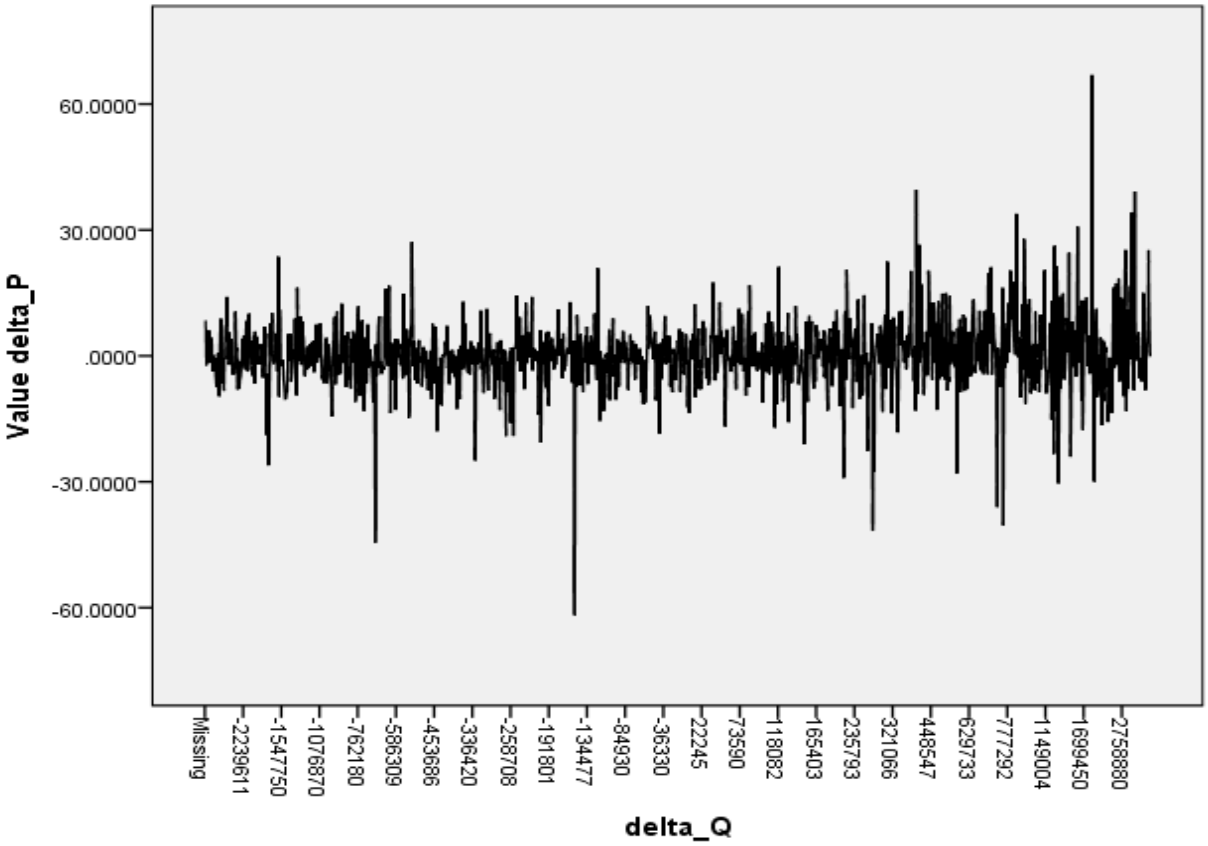

Fig. 2 Line Diagram: Price Change vs. Demand Change

The following graph shows the pattern of elasticity movement with respect to price movement.

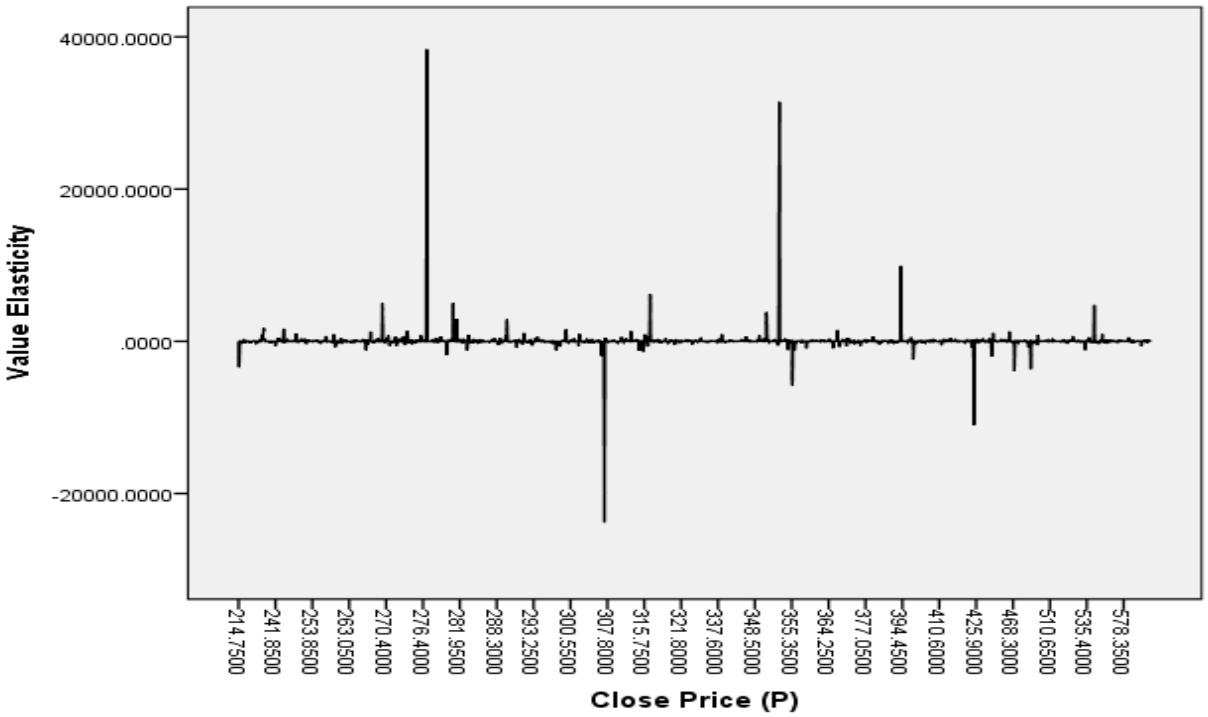

Fig. 3 Line Diagram: Price vs. Elasticity

Table 1. Descriptive Statistics

	Mean	Std. Deviation	Count(N)
Close Price (P)	355.261511	95.4598551	1238
No.of Shares (Q)	1381803.39	1583418.398	1238
delta_P	0.277001	8.4311	1237
delta_Q	64.57	2022636.870	1237
Elasticity	57.3355	1695.35	1235

The following diagram shows the Multilayer Perception (ANN) with hidden layers and bias.

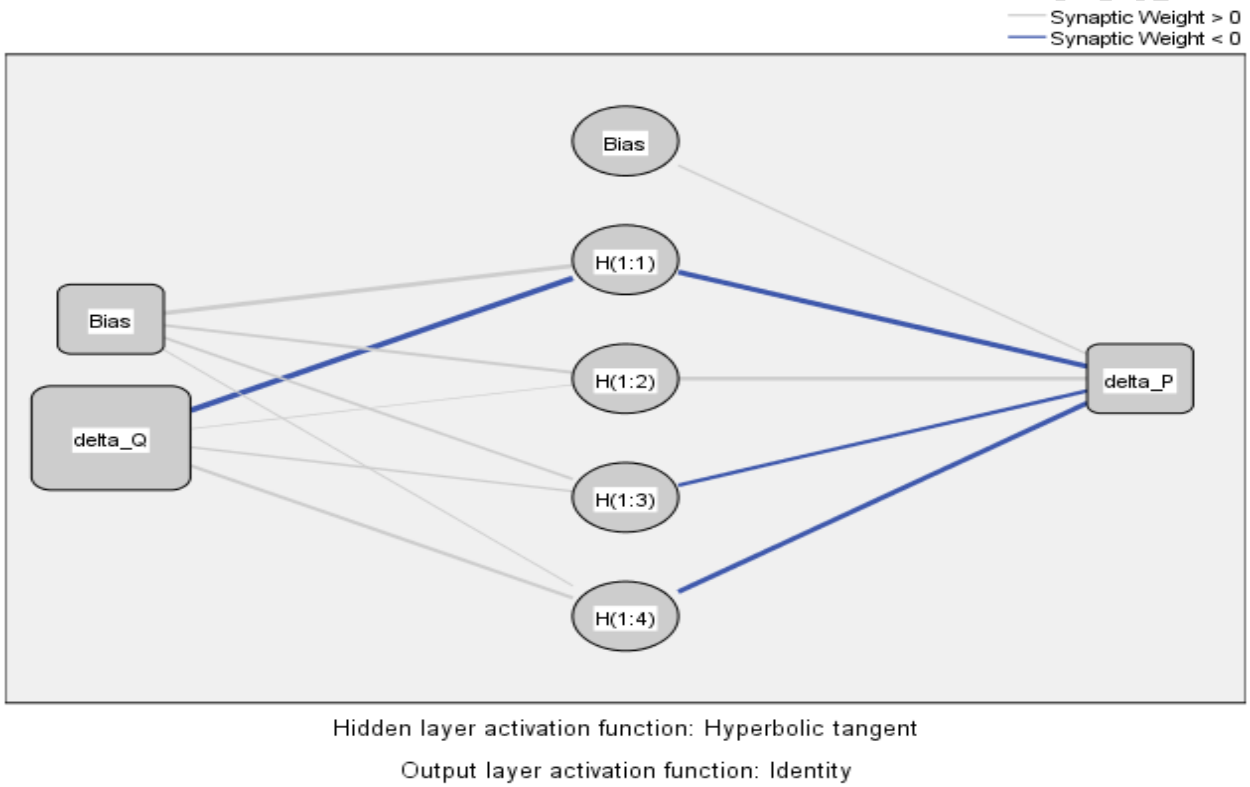

Fig. 4 Multilayer Perception (ANN)

Table 2. Case Processing Summary (ANN)

		N	Percent
Sample	Training	851	68.8%
	Testing	386	31.2%
Valid		1237	100.0%
Excluded		1	
Total		1238	

Table 3. Model Summary

Training	Sum of Squares Error	419.006
	Relative Error	.986
	Stopping Rule Used	1 consecutive step(s) with no decrease in error[a]
	Training Time	0:00:00.13
Testing	Sum of Squares Error	246.003
	Relative Error	.988

Dependent Variable: delta_P

a. Error computations are based on the testing sample.

Table 4. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.277	.239		1.158	.247
	delta_Q	3.024E-007	.000	.073	2.556	.011

The following diagram shows the Histogram for frequency of standardized residual.

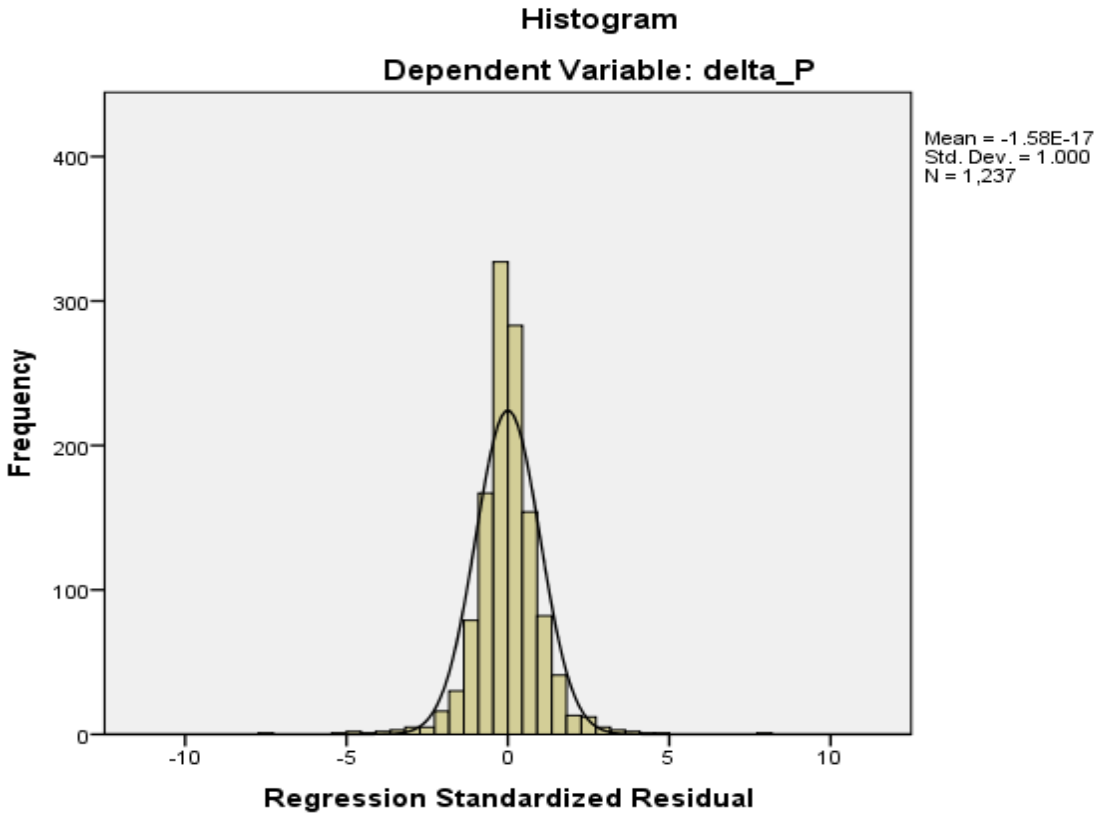

Fig. 5 Histogram

The following diagram depicts the P-P plot for standardized residual.

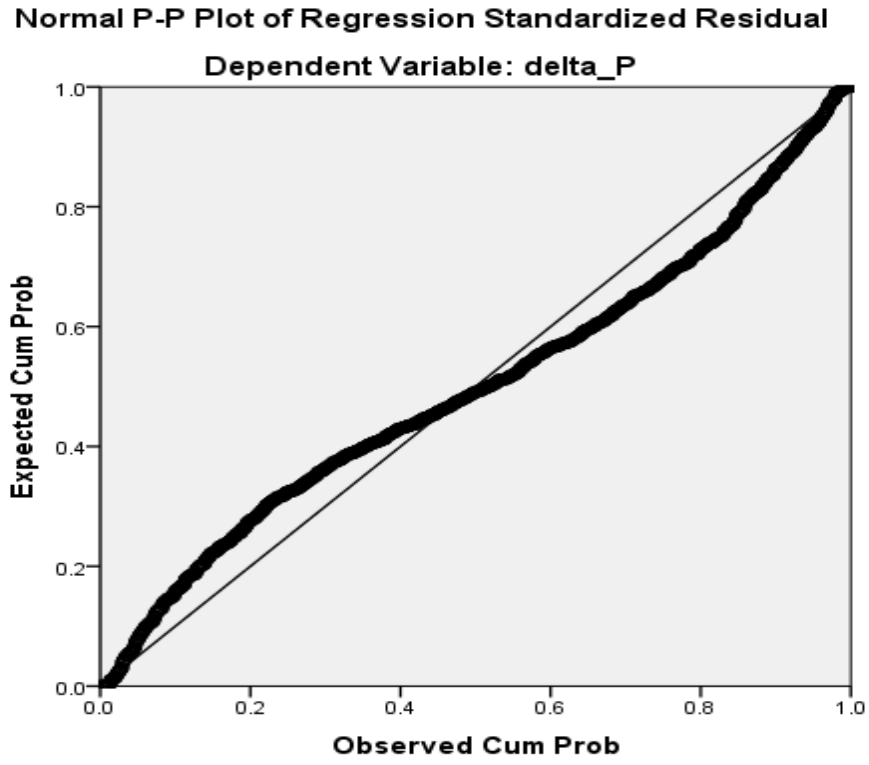

Fig. 6 P-P Plot

Regression Models

The regression models are the final outcome regression analysis. The following regression models are envisaged in this research.

Regression Model 1

delta_P = 0.277 + 0.0000003024 delta_Q

WHERE delta_P = PRICE CHANGE, delta_Q = DEMAND CHANGE

Regression Model 2

P = 361.642 - 0.000004617 Q

WHERE P = PRICE, Q = DEMAND

Regression Model 3

E = 195.166 – 0.388 P

WHERE E = ELASTICITY, P = PRICE

5. Conclusion

The relationships between various key indicators of stock are very important to understand the market dynamics. The present research has envisaged those relationships for banking stock.

The test results of this study prove the following hypotheses.

1. Change of price of a stock has positive relation with change of quantity or demand in the market.

2. Price of a stock has negative relation with Quantity or Demand in the market. This phenomenon is supported by Law of Demand for normal goods.

3. Price elasticity of demand has negative relation with stock Price in the market.

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