

# Identifying Feature Stock Price by Considering Most Influential Parameters using Prediction Methods in Indian Stock Exchange



K.Sudhakar, S.Naganjaneyulu

**Abstract:** Before the evaluation of big data analytics predicting the optimal share price in the stock market is very difficult, by applying the big data analytics it is easy to predict frequent patterns and feature outcomes in any domain. So in this paper we consider the financial domain to predict feature outcomes of share prices in the Indian stock exchange. We first gathered the dataset with duration 2011-2016 financial years of TCS Company, the reason to choose TCS dataset it is a trust based company and datasets are available at open access with all parameters. Market price per share is strongly affected by company's variable like price earnings, dividend yield, dividend per share, earnings per share, book value per share, and return on equity, after observing the results we conclude that the variables price earnings, book value per share and firm size are important determinants of share prices in the Indian stock market. The regression model achieved a high  $R^2$  (0.94) for the closed price and book value per share variable and also the model achieved a high  $R^2$  (0.98) for the closed price and price earnings.

**Index Terms:** Market price of share, regression, firm specific variables.

## I. INTRODUCTION

### 1 Introduction

Stock price prediction model is created based on fundamental analysis, technical analysis, machine learning and text mining on articles, news, twitter news; these are the possible ways to predict the feature outcomes in stock markets. The company performance is identified by using fundamental analysis. Fundamental analysis uses revenues, earnings, future growth, return on equity, profit margins and other data to determine a company's underlying value and potential for future growth.

*Algorithm for fundamental analysis based on intrinsic value*

Step1: read the intrinsic value, current value of stock.  
Step2: if intrinsic value > current value goto step3.  
Step3: buy the stock.  
Step4: else sell the stock.  
Step5: stop.

## II. EXAMPLE

Tcs intrinsic value is 2300 the present current price is 2200 then buy signal generated. Means the current price is less than intrinsic value then buy signal is generated otherwise sell signal is generated.

Financial advisors study price charts for price patterns and use price data in different calculations to predict future price movements. In this paper we consider company's specific parameters to predict the future outcomes through linear regression.

### 2 Motivation

The massive rapid increase in the amount of data and increasing technological complexities continue to transform the way industries operate and compete. Over the last four years, 92 percent of the data in the world has been created as a result of the creation of 4.5 quintillion bytes of data on a daily basis, frequently name to as big data. This fast development and capacity makes good time for gathering, handling and investigation of structured and unstructured information.

Organizations utilize information and investigation to increase profitable knowledge to advise better business choices. Businesses that have embraced the utilization of enormous information incorporate money related administrations, innovation, promoting and medicinal services, to give some examples. The selection of big data keeps on reclassifying the aggressive scene of industries. An expected 91 percent of industries trust those without an analytics system risk losing a focused edge in the market.

Financial services, specifically, have generally acquired big data analytics to educate better investments choices with reliable returns. In coincidence with big data, algorithmic trading utilizes massive historical data with prediction models to maximize portfolio returns. Adopting the big data analytics to financial services will inevitably gives good prediction results.

Stock market price prediction is a problem that has the potential to be worth corers of rupees and is actively researched by the largest financial corporations in the world.

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It is a significant problem; attempts can be made at approximation using many different machine learning techniques. The project allows techniques for real-world machine learning applications including acquiring and analyzing a large data set and using a variety of techniques to train the program and predict potential outcomes.

### III. RELATED WORK

“The determinants of share cost were started by Collins (1957) for the US market and he recognized profit, net benefit, working income and book an incentive as the prominent factors influencing share prices in the United States”. Irfan and Nishat (2002) distinguished variables exerting impact on the share costs in KSE for the period in the vicinity of 1981 and 2000. The review utilized cross-sectional weighted minimum square regression and broke down the effect of six factors viz. profit yield, payout proportion, size, asset development, and procuring instability on share costs, Of these the payout proportion, size, use and profit yield rose

as the critical factors influencing the stock exchange prices in KSE. By observing the above work we infer that, the firm specific variables significantly affect on market price of shares. So many studies reveal price earnings ratios, book value per share, dividend payouts, market capitalization variables are show the impact on Indian stock exchange. This paper will focus by leading a far reaching investigation of firm specific factors, for example, profit per share, profit yield, and profit per share, book value per share, price earnings ratio and firm size to decide their degree of effect on the share price of TCS Company.

To develop the prediction models, understanding the statistical concepts plays a very important role. Dependent and independent variables are statistical concepts. Definition of dependent variable and independent variable depend on the prediction model. We have adequate information on statistical concepts in view of learning we build the prediction model.

### IV. DATA COLLECTION

**Table 1. Historical Prices of TCS Share**

Historical Prices							
Company Name: Tata Consultancy Services Ltd.							
Exchange : BSE							
Price Date	Open Price	High price	Low price	Close price	Traded value	Number of trades	Traded Quantity
12/30/2016	2351.9	2375.9	2351.9	2361.95	98109047	3269	41479
12/29/2016	2304.9	2355	2304.9	2350.75	97507710	2592	41571
12/28/2016	2325	2349	2308.05	2315.8	78697510	2857	33696
12/27/2016	2290	2329	2288.85	2321.85	72082333	2375	31085
12/26/2016	2280	2300	2272.5	2292.1	70389097	2077	30731
12/22/2016	2312.75	2324.7	2286	2309.85	99137747	2334	42989

The information for the review was recovered from the Indian stock exchange site to be specific www.nseindia.com. At present 30 organizations are recorded in the stock exchange and the organizations fall under the class of Commercial Banks, Investment administrations, Insurance organizations, Industrial part, IT administrations, and tourism organizations. We collected the TCS company data with duration of 2011-2016 years. After that we calculated the PE, EPS, and BOOK VALUE etc.

### V. METHODOLOGY

In this paper we create prediction model by using most popular prediction approach that is linear regression. It is utilized to predict optimal values based on continuous variables. Here, we identify the correlation between independent and dependent variables by fitting a best line. This best fit line is known as regression line and represented by a linear equation.

$$y = a_1 * x + a_2.$$

Where as

y =dependent variable

a2=intercept

x= Independent variable

a1=slope.

The coefficients a1 and a2 are inferred in view of limiting the total of squared distinction of separation between data points and regression line. We implement this model using R language.

#### R code for linear regression model

```
# load test data sets
#identify feature and response
variable(s) and values must be numeric
and numpy arrays
x_train <-
input_variables_values_training_datase
ts
y_train <-
target_variables_values_training_dataset
s
x_test<-input_variables_values_test_data
sets
x <- cbind(x_train,y_train)
# Train the model using the training sets
and check score
linear <- lm (y_train ~ data = x)
Summary (linear)

#Predict Output
```



`predicted= predict(linear x_test)`

1	Return on equity (ROE) =Net Income per Shareholders.
2	Book value per share (BVS) =Total shareholders' equity per Number of shares outstanding.
3	Earnings per share (EPS) = net income per number of shares.
4	Dividend per share = Dividends paid per Number of shares outstanding.
5	Dividend yield (DY) = Dividend per share per price per share.
6	Price earnings (PE) = Stock price per EPS.
7	Debt to total assets (DA) =Total debt per Total Assets

The types of variables used in our model are

**Independent Variables**

**Control Variable**

Firm size Market capitalization (MACP) = Market price of share \*number of shares outstanding.

**Dependent Variable**

Market price of share (MPS) = Closing share price.

Linear regression identify the correlation and R<sup>2</sup> between the independent and dependent variables, based on R<sup>2</sup> we can get strongest correlation between variables.

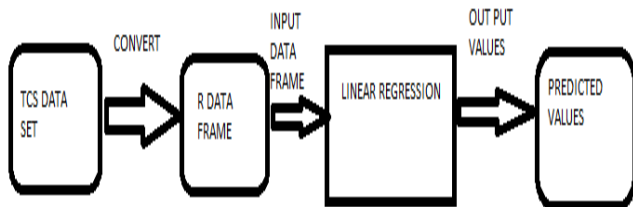


Fig no 1: Estimation model or prediction model

**VI. RESULTS**

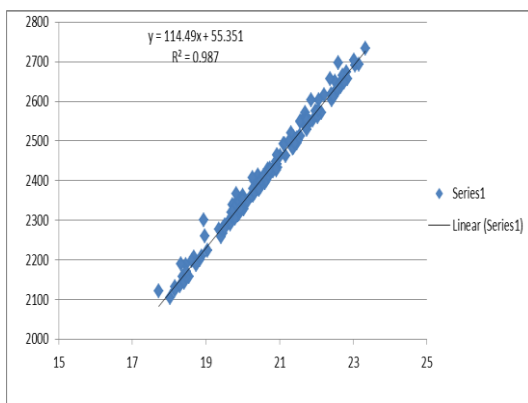


Fig 2: shows the relation between PE(X- axis) and closed price (Y-axis)

The figure 2 represents the linear regression equation that is obtained by giving input data to linear regression algorithm. The equation  $y=114.4x+55.35$  And  $R^2=0.987$  means we got a strong correlation between PE and closed price.

By using the line equation we can predict the next optimal outcome.

For example  $y=114.4*19.86+55.35$

$Y= MPS = 2327.59$ . Where  $x= PE$  of the current year

Table 2. Summary of Variables for TCS share

Price Date	Open Price	High price	low price	close price	Trade qty	EPS	PE
12/30/2016	2351.9	2375.9	2351.9	2361.95	41479	116	20.275
12/29/2016	2304.9	2355	2304.9	2350.75	41571	116	19.86983
12/28/2016	2325	2349	2308.05	2315.8	33696	116	19.89698
12/27/2016	2290	2329	2288.85	2321.85	31085	116	19.73147
12/26/2016	2280	2300	2272.5	2292.1	30731	116	19.59052
12/23/2016	2309	2315.7	2280	2290.2	28276	116	19.65517
12/22/2016	2312.75	2324.7	2286	2309.85	42989	116	19.7069
12/21/2016	2345	2345	2305	2312.75	31711	116	19.87069

Actually in the retrieved dataset there is no EPS and PE values, we calculated the EPS, PE, BVS, etc by using standard formulas. In the above dataset the PE value on 29/12/2016 is 19.86, that is used in our model to get next day predicted value, after substitution the values we got 2327.59.

The Closed price on 30/12/2016 is 2361.95. The outcome (or) predicted value is 2327.59 which is close to actual closed price. If we consider 30/12/2016 PE value then we can identify the predicted value of 1/1/2017 and so on. Next we find the correlation between close price and BVS variables. The following figure shows the relation between close price and BVS.

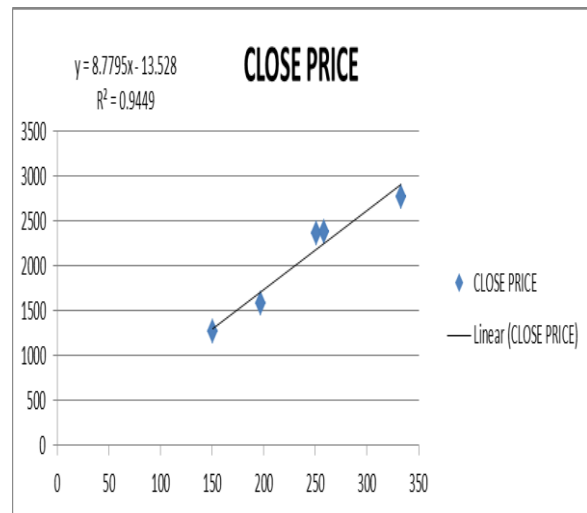


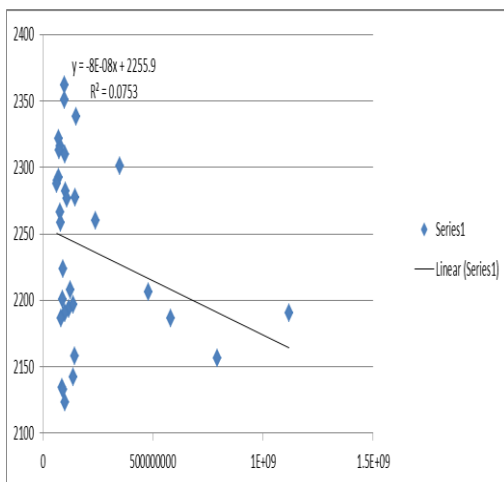
Fig 3: relation between close price and BVS (book value per share)

The x-axis represents the BVS (book value per share). The y-axis represents the close price. There is a strong correlation between BVS and close price, we identify based on R<sup>2</sup>, and the R<sup>2</sup> is 0.944 means 94%. This means prediction accuracy is 94%.



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Next we identify the relation between traded volume and close price. The following figure shows the relation between traded volume and close price.



**Fig 4: relation between volume and close price.**

We achieved the low  $R^2$  that is 0.075 means the prediction accuracy is 7.5%. So we concluded the close price is not depending on traded volume. The trend line also shows the same. If too much volume is increased the price value is decreased.

## VII. CONCLUSIONS

The foremost intension of this work is to inspect the determinants of market price of TCS share. The research mostly try to found a relationship between market price of shares (MPS) and additional variables specifically price earnings (PE), book value of share (BVS), earnings per share (EPS), traded volume, return on equity (ROE), dividend per share (DPS), dividend yield (DY), debt to total asset (DA) and firm size (MCAP).

The factual results show effective and notable correlation between PE, BVS, and traded volume recommended that these variables perform as influential determinants in making the market price of shares.

The empirical results also shows the notable negative correlation was identified between traded volume, and closed price. This suggests that traded volume is not an optimal variable to predict the closed price. Hence traded volumes cannot attract the investors. Closed price is closed related to the market price of share, here we consider predicted closed price as a feature market price of TCS share.

### Recommendations

Investors can expand their portfolio simply by observing the PE ratios, book value per share, market capitalization of the company and ROE variables.

### Limitations

Here we are not consider the Macro-Economic factors like monsoon, inflation, interest rates, GDP, etc and also not consider the articles, magazines, tweets. In India Stock markets are highly affect by various kinds of news, survey reports, ratings, and latest demonetization effect.

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