# Original Research Paper

## Commerce

# APPLICATION OF ALTMAN Z-SCORE MODEL TO WIPRO

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**ABSTRACT** Finance is considered to be the most important aspect of an organization. If the financial performance is not good of an organization than it cannot grow neither it can sustain for longer time phase hence proper management of financial resources is required further it needs proper attention in order to optimize the financial resources. Altman Z- score is a technique for evaluation of financial position of the organization mostly related to predicting bankruptcy. z-score methodology is developed by renowned professor Altman and the model is named after him only. The Altman Z-score is recommended for manufacturing as well as for non-manufacturing organization. The Altman Z-score is modified and only four criteria's are being evaluated hence researcher had decided to conduct the study titled Application of Altman Z-score model for Wipro.

**KEYWORDS :**

## ALTMAN'S Z-SCORE MODEL

Edward Altman Finance Professor of the Leonard N. Stern School of Business of New York University has developed the Financial Model in 1967 to predict the likelihood of bankruptcy of the company which is named as Altman's Z-Score Model. Later, in 2012 he released an updated version called the Altman's Z-Score plus Model that can be used to evaluate both manufacturing & non-manufacturing firms & public & privative companies in both U.S & non-U.S companies. The investors can use this model to determine whether to buy or sell a particular stock if they are concerned about the financial strength of the organization. The Altman Z-score Plus can be used to evaluate corporate credit risk. Altman added a statistical technique called multivariate analysis to the mix of traditional ratio analysis techniques, and this allowed him to consider not only the effects of several ratios on the " predictiveness " of his bankruptcy model, but to consider how those ratios affected each other's usefulness in the model. The model formed by Altman for predicting a company's financial health is as follows;

Z-SCORE FORMULA FOR NON-MANUFACTURING FIRMS
$X1 = $ Current Assets $-$ / Total Assets
$X2 = $ Retained Earnings / Total Assets
$X3 = $ Earnings Before Interest and Taxes / Total Assets
$X4 = $ Book Value of Equity / Total Liabilities
Z-Score bankruptcy model:
$Z = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$
Zones of discriminations:
$Z > 2.6$ -"Safe" Zone
$1.1 < Z < 2.6$ -"Grey" Zone
$Z < 1.1$ -"Distress" Zone

## Research Methodology
### Period of study
Study only considers a period of 6 years (2013-2018)

### Data collection
Data collected from capital market data base

### Tool used for data analysis
Altman z-score model for non-manufacturing is used for analysis

### Data analysis and interpretation
### Current Asset to total Asset ratio
The ratio indicates investment in current asset in comparison to total assets. An increasing Working Capital to Total Assets ratio is usually a positive sign, showing the company's liquidity is improving over time. A low or decreasing ratio indicates the company may have too many Total Current Liabilities, reducing the amount of Working Capital available. From the table 1.1 it is evident that the Current Asset to total Asset ratio shows decreasing trend from the year 2017 to 2016 because of low investment in current asset further the ratio shows increasing trend from 2013 to 2015 which signifies good liquidity position.

### Retained earnings to total assets ratio
The ratio of retained earnings to total assets helps measure the extent to which a company relies on debt, or leverage. The lower the ratio, the more a company is funding assets by borrowing instead of through retained earnings which, again, increases the risk of bankruptcy if the firm cannot meet its debt obligations. It is evident from the table 1.2 Retained earnings to total assets ratio of Wipro which emphasizing the financial health is under control as more funding is done by retained earnings for the simple reason of ploughing back of profit. The average ratio is 0.89 times which clearly indicates that maximum financing is done by retained earnings and ploughing back of profit.

### Return on total assets (ROTA)
Return on total assets (ROTA) is a ratio that measures a company's earnings before interest and taxes (EBIT) relative to its total net assets. The ratio is considered to be an indicator of how effectively a company is using its assets to generate earnings. It is evident from the table 1.3 that the ROTA is higher in the year 2014 which signifies growth and increase financial wealth. The average 0.28 times which signifies good ROTA.

**Book Value of Equity / Total Liabilities** ratio signifies the financial leverage of the company. Higher the financial leverage more is the financial risk. It is evident from the table 1.4 that the Book Value of Equity / Total Liabilities ratio is higher in the year 2018 which signifies higher financial risk but overall analysis shows the ratio below the alarming point and hence the financial risk involved is negligible.

### z- score analysis
The table 1.5 shows that from the selected sample of 6 years. Wipro never show any sign of Distress. This means that the financial performances of Wipro are excellent & are far away from experience Bankrupt. The company is eligible to borrow the funds from banks & financial institutes & even the investors will be interested to invest as they have hopes to get excellent returns.

Z Value of Wipro also falls under safe Zone consistently for all years under the study. This indicates the excellent financial performance. The f-ratio value of z-score ratios used to calculate Altman's Z-score is 28.66442 p. which signifies no significance difference between the ratios used for calculation of Altman's Z-score. The p-value is < .00001. The result is significant at $p < .05$.(Refer Table 1.6 Appling ANNOVA to Altman Z-score Ratio of Wipro) further , the firm has generated good amount of profits in all the 6 years but the current assets are on higher side which indicates good liquidity position to meet its short term obligations. Management has taken tremendous caution in order to attract potential investors & can continue to survive in the market. Among the selected sample year Wipro is performing consistently high with "safe zone" as far as financial health is concern.

## CONCLUSION
This study investigated the applicability of the Altman's bankruptcy model to examine the financial position of the Wipro. The study covers the 6 years study period. According to findings For Most of years the Wipro are in safe Zone which clearly indicates that the top level management had design effective strategies for better control & management of financial resources which result in win-win situation for both management & investors

**Table 1.1 showing Current Asset to total Asset ratio for Wipro**

| Year | Current Asset | Total Asset | C.A/T.A |
|------|---------------|-------------|---------|
| 2018 | 18126.1 | 45566.7 | 0.397793 |
| 2017 | 19580.4 | 51202.6 | 0.38241 |
| 2016 | 24840.8 | 46241.7 | 0.537195 |
| 2015 | 34666.7 | 37618.1 | 0.921543 |
| 2014 | 26765 | 30753.6 | 0.870305 |
| 2013 | 22335.3 | 27501.5 | 0.812148 |
|  |  | Avg | 0.653566 |
|  |  | Max | 0.921543 |
|  |  | Min | 0.38241 |

**Table 1.2 showing Retained earnings to total assets ratio**

| Year | Retained earnings | Total Asset | RE/TA |
|------|-------------------|-------------|-------|
| 2018 | 41357.8 | 45566.7 | 0.907632109 |
| 2017 | 46219.5 | 51202.6 | 0.90267877 |
| 2016 | 40731.6 | 46241.7 | 0.880841319 |
| 2015 | 34127.9 | 37618.1 | 0.907220195 |
| 2014 | 28862.7 | 30753.6 | 0.938514515 |
| 2013 | 23736.9 | 27501.5 | 0.863112921 |
|  |  | Avg | 0.899999971 |
|  |  | Max | 0.938514515 |
|  |  | Min | 0.863112921 |

**Table 1.3 showing Return on total assets (ROTA) ratio**

| Year | EBIT | Total Assets | EBIT/TA |
|------|------|--------------|---------|
| 2018 | 11433.4 | 45566.7 | 0.250916 |
| 2017 | 12202.8 | 51202.6 | 0.238324 |
| 2016 | 12019.5 | 46241.7 | 0.259928 |
| 2015 | 11698.3 | 37618.1 | 0.310975 |
| 2014 | 10719.6 | 30753.6 | 0.348564 |
| 2013 | 8258.8 | 27501.5 | 0.300304 |
|  |  | Avg | 0.284835 |
|  |  | Max | 0.348564 |
|  |  | Min | 0.238324 |

**Table 1.4 Showing Book Value of Equity / Total Liabilities ratio**

| Year | Equity | Total Liability | E/TL |
|------|--------|-----------------|------|
| 2018 | 904.8 | 9305.5 | 0.097232819 |
| 2017 | 486.1 | 8676.3 | 0.056026186 |
| 2016 | 494.1 | 9545.5 | 0.051762611 |
| 2015 | 493.7 | 12325.9 | 0.04005387 |
| 2014 | 493.2 | 11308.3 | 0.043613983 |
| 2013 | 492.6 | 10088.6 | 0.048827389 |
|  |  | Avg | 0.05625281 |
|  |  | Max | 0.097232819 |

**Table 1.5 Showing Z-score Analysis for Wipro**

|  | X1 | X2 | X3 | X4 | z-score | Zone |
|------|------|------|------|------|---------|------|
| **2018** | 2.60952 | 2.904423 | 1.686153 | 0.102094 | 7.302191 | **Safe zone** |
| **2017** | 2.508611 | 2.888572 | 1.601536 | 0.058827 | 7.057547 | **Safe zone** |
| **2016** | 3.523998 | 2.818692 | 1.746714 | 0.054351 | 8.143755 | **Safe zone** |
| **2015** | 6.045323 | 2.903105 | 2.089754 | 0.042057 | 11.08024 | **Safe zone** |
| **2014** | 5.709198 | 3.003246 | 2.342351 | 0.045795 | 11.10059 | **Safe zone** |
| **2013** | 5.327694 | 2.761961 | 2.01804 | 0.051269 | 10.15896 | **Safe zone** |
| **AVG** | 4.287390629 | 2.879999908 | 1.914091475 | 0.05906545 | 9.140547462 | **Safe zone** |
| **MAX** | 6.045322651 | 3.003246449 | 2.342350554 | 0.10209446 | 11.10058996 | **Safe zone** |
| **MIN** | 2.50861136 | 2.761961348 | 1.601536172 | 0.042056564 | 7.057547092 | **Safe zone** |

**Table 1.6 Appling ANNOVA to Altman Z-score Ratio of Wipro**

|  | *Treatments* |  |  |  |  |
|------|------|------|------|------|------|
|  | X1 | X2 | X3 | X4 | Total |
| N | 6 | 6 | 6 | 6 | 24 |
| $\sum$X | 25.7243 | 17.28 | 11.4845 | 0.3544 | 54.8433 |
| Mean | 4.2874 | 2.88 | 1.9141 | 0.0591 | 2.285 |
| $\sum$X$^2$ | 123.0465 | 49.8005 | 22.3852 | 0.0233 | 195.2555 |
| Std.Dev. | 1.5973 | 0.0826 | 0.2838 | 0.0219 | 1.7437 |
| **Result Details** |  |  |  |  |  |
| *Source* | *SS* | *Df* | *MS* |  |  |
| Between-treatments | 56.7357 | 3 | 18.9119 | $F = 28.66442$ |  |
| Within-treatments | 13.1954 | 20 | 0.6598 |  |  |
| Total | 69.9311 | 23 |  |  |  |

*The f-ratio value is 28.66442. The p-value is < .00001. The result is significant at p < .05.*

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