CHAPTER - III

ANALYSIS OF MARKETING STRATEGIES OF BSNL AND PRIVATE SECTOR TELECOM SERVICE PROVIDERS IN KERALA
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3.1 Introduction

This chapter deals with the analysis of primary data collected to study the marketing strategies of public sector telecommunication service provider BSNL in comparison with private sector telecommunication service providers in Kerala. The Statistical Package for Social Sciences (SPSS 16.0) was used for the data analysis.

The primary data collection for the study was conducted for a six months period from July 2012 to December 2012. During that period, there were ten mobile telecom service providers in Kerala specifically: Idea, BSNL, Vodafone, Airtel, Reliance, Tata, Tata Docomo, MTS, Aircel and Uninor. Among the various mobile telecom service providers in Kerala, BSNL (Bharat Sanchar Nigam Limited) is the one and only telecom operator in public sector under the ownership of Government of India. The other telecom service providers in Kerala are private sector organisations. The mobile subscriber base in Kerala as on March 2013 is 306.89 lakhs. More than 70% of mobile telecom market share in Kerala is vested with three telecom operators namely Idea (25.81 %), BSNL (25.17%) and Vodafone (20.21%). Even though Airtel is in fourth place in Kerala with a market share of 11.41%, they are the top among telecom mobile service providers in India in terms of market share\(^1\). Hence BSNL along with these three major telecom service providers are primarily considered for the data analysis pertaining to the comparative study of marketing strategies. However the services marketing aspects of other mobile telecom service providers and their marketing strategies relevant to the context are also included in the study. In the data analysis of marketing of 3G mobile telecom services, the service provider Tata Docomo is also included in the study, taking into account its’ a vital role in 3G segment. Analysis of services marketing aspects of landline and landline broadband internet services are the part of the study.

\(^1\) Press releases on subscriber data, March 2013. Telecom Regulatory Authority of India. www.trai.gov.in
The data analysis pertaining to the study is presented in eight sections.

1. The descriptive statistics of the study sample.

2. Analysis of product differentiation strategies of BSNL and private sector mobile telecom service providers in Kerala.

3. Analysis of pricing strategies of BSNL and private sector mobile telecom service providers in Kerala.

4. Analysis of promotion strategies of BSNL and private sector mobile telecom service providers in Kerala.

5. The effect of service related factors on customer satisfaction and customer loyalty of customers of mobile telecommunication services.

6. Third generation (3G) mobile telecommunication services: Analysis of marketing strategies of BSNL and private sector mobile telecom service providers in Kerala.

7. Analysis of demographic profile of respondents and preference for a particular mobile telecom service provider.

8. Analysis of services marketing aspects of landline and landline broadband internet services.

3.2 The descriptive statistics of the study sample

The mobile telephone customers of Kerala are the population considered for the study. Stratified multistage random sampling technique, coming under the category of probability sampling designs is mainly used for selecting the samples for the primary data collection. In the first stage, the entire population is divided into three strata, namely urban, semi-urban and rural. The municipal corporations are identified as urban stratum, the municipalities are identified as semi-urban stratum and the panchayat are identified as rural stratum. The sample size of the present study is 1080 comprising of 360 random samples each from each stratum. The distribution of sample respondents by locality and place of residence is given in the table 3.2.1.
Table 3.2.1

Distribution of sample respondents by locality and place of residence

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Locality</th>
<th>Place of residence</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Urban</td>
<td>Thiruvananthapuram Corporation</td>
<td>120</td>
<td>11.1</td>
</tr>
<tr>
<td>2</td>
<td>Urban</td>
<td>Kochi Corporation</td>
<td>120</td>
<td>11.1</td>
</tr>
<tr>
<td>3</td>
<td>Urban</td>
<td>Kozhikode Corporation</td>
<td>120</td>
<td>11.1</td>
</tr>
<tr>
<td>4</td>
<td>Semi-Urban</td>
<td>Neyyattinkara Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>5</td>
<td>Semi-Urban</td>
<td>Punalur Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>6</td>
<td>Semi-Urban</td>
<td>Pala Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>7</td>
<td>Semi-Urban</td>
<td>Chalakudi Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>8</td>
<td>Semi-Urban</td>
<td>Vadakara Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>9</td>
<td>Semi-Urban</td>
<td>Malappuram Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>10</td>
<td>Semi-Urban</td>
<td>Kalpetta Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>11</td>
<td>Semi-Urban</td>
<td>Kannur Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>12</td>
<td>Semi-Urban</td>
<td>Kasaragod Municipality</td>
<td>40</td>
<td>3.7</td>
</tr>
<tr>
<td>13</td>
<td>Rural</td>
<td>Chenkal Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>14</td>
<td>Rural</td>
<td>Chirayinkeezhu Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>15</td>
<td>Rural</td>
<td>Ambalapuzha South Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>16</td>
<td>Rural</td>
<td>Thirikkunnapuzha Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>17</td>
<td>Rural</td>
<td>Vazhakkulam Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>18</td>
<td>Rural</td>
<td>Choornikkara Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>19</td>
<td>Rural</td>
<td>Mattathur Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>20</td>
<td>Rural</td>
<td>Mundoor Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>21</td>
<td>Rural</td>
<td>Kongad Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>22</td>
<td>Rural</td>
<td>Wandoor Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>23</td>
<td>Rural</td>
<td>Kodur Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>24</td>
<td>Rural</td>
<td>Kadalundi Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>25</td>
<td>Rural</td>
<td>Kakkodi Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>26</td>
<td>Rural</td>
<td>Ambalavayal Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>27</td>
<td>Rural</td>
<td>Thirunelly Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>28</td>
<td>Rural</td>
<td>Panoor Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>29</td>
<td>Rural</td>
<td>Peralassery Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td>30</td>
<td>Rural</td>
<td>Udma Panchayat</td>
<td>20</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>1080</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.
A sample of 120 customers each from Thiruvananthapuram, Kochi and Kozhikode municipal corporations represents the urban stratum. A sample of 40 customers each from the nine municipalities of Kerala represents the semi-urban stratum. The rural stratum is represented by 20 customers each from eighteen grama-panchayats of Kerala. The municipal corporations of Thiruvananthapuram, Kochi and Kozhikode were selected for sample collection due their high nature of urban characteristics. The nine municipalities and eighteen grama-panchayats were selected through simple random sampling method.

In addition to the locality and place of residence, the demographic variables of sample respondents collected for the study are age group, gender, educational qualifications, employment status and annual family income. The distribution of sample respondents by age group is given in the table 3.2.2. It shows that nearly 47% of the respondents belonging to the age group up to 30 years.

Table 3.2.2
Distribution of sample respondents by age group

<table>
<thead>
<tr>
<th>Age group (in years)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>93</td>
<td>8.6</td>
</tr>
<tr>
<td>20 - 30</td>
<td>416</td>
<td>38.5</td>
</tr>
<tr>
<td>30 - 40</td>
<td>278</td>
<td>25.7</td>
</tr>
<tr>
<td>40 - 50</td>
<td>207</td>
<td>19.2</td>
</tr>
<tr>
<td>50 - 60</td>
<td>63</td>
<td>5.8</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>23</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>1080</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of sample respondents by gender is given in the table 3.2.3. It shows that male respondents are 63% and female respondents are 37%.

Table 3.2.3
Distribution of sample respondents by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>680</td>
<td>63.0</td>
</tr>
<tr>
<td>Female</td>
<td>400</td>
<td>37.0</td>
</tr>
<tr>
<td>Total</td>
<td>1080</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.
The distribution of sample respondents by educational qualification is given in the table 3.2.4. It can be seen that 60% of sample respondents belonging to high educational profile, possessing the qualification level of graduation and above.

**Table 3.2.4**

**Distribution of sample respondents by educational qualification**

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 10th standard</td>
<td>120</td>
<td>11.1</td>
</tr>
<tr>
<td>10th Standard pass - Below Graduation</td>
<td>316</td>
<td>29.3</td>
</tr>
<tr>
<td>Graduation and Above</td>
<td>313</td>
<td>29.0</td>
</tr>
<tr>
<td>Professional / Technical Degree</td>
<td>331</td>
<td>30.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1080</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of sample respondents by employment status is given in the table 3.2.5. The employment status is categorized in eight segments namely Government Service, Private Sector, Business, Professional, Self Employed, Student, Retired and House Wife.

**Table 3.2.5**

**Distribution of sample respondents by employment status**

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Service</td>
<td>122</td>
<td>11.3</td>
</tr>
<tr>
<td>Private Sector</td>
<td>184</td>
<td>17.0</td>
</tr>
<tr>
<td>Business</td>
<td>132</td>
<td>12.2</td>
</tr>
<tr>
<td>Professional</td>
<td>106</td>
<td>9.8</td>
</tr>
<tr>
<td>Self Employed</td>
<td>188</td>
<td>17.4</td>
</tr>
<tr>
<td>Student</td>
<td>229</td>
<td>21.2</td>
</tr>
<tr>
<td>Retired</td>
<td>33</td>
<td>3.1</td>
</tr>
<tr>
<td>House Wife</td>
<td>86</td>
<td>8.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1080</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.
The distribution of sample respondents by annual family income is given in the table 3.2.6. It can be seen that 44% of sample respondents belonging to low income group, their annual family income is less than two lakhs.

**Table 3.2.6**

**Distribution of sample respondents by annual family income**

<table>
<thead>
<tr>
<th>Annual family income  (in lakhs of Rupees)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2</td>
<td>480</td>
<td>44.4</td>
</tr>
<tr>
<td>2 - 5</td>
<td>436</td>
<td>40.4</td>
</tr>
<tr>
<td>5 - 10</td>
<td>123</td>
<td>11.4</td>
</tr>
<tr>
<td>≥ 10</td>
<td>41</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1080</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The mobile customer base in Kerala as on March 2013 is 306.89 lakhs. The mobile telecom service providers in Kerala and their respective market shares as on March 2013 are: Idea (25.81%), BSNL (25.17%), Vodafone (20.21%), Airtel (11.41%), Reliance (9.58%), Tata (5.92%), MTS (1.56%), and Aircel (0.34%)\(^2\). Here Tata represents the Tata group including Tata Docomo. The market leader is Idea and the immediate followers are BSNL and Vodafone. In the beginning of the year 2013 Uninor withdrew from the telecom market of Kerala. The distribution of most preferred mobile service providers of the sample respondents is given in the table 3.2.7. It can be seen that the percentage representation of mobile service providers in the primary survey has high correlation with their actual market shares. This ensures the high reliability of the study sample.

\(^2\) Press releases on subscriber data, March 2013. Telecom Regulatory Authority of India. www.trai.gov.in
Table 3.2.7
Distribution of most preferred mobile service providers of sample respondents

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>264</td>
<td>24.4</td>
<td>24.4</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>23.6</td>
<td>48.1</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>21.2</td>
<td>69.3</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>11.3</td>
<td>80.6</td>
</tr>
<tr>
<td>Reliance</td>
<td>79</td>
<td>7.3</td>
<td>87.9</td>
</tr>
<tr>
<td>Tata</td>
<td>12</td>
<td>1.1</td>
<td>89</td>
</tr>
<tr>
<td>Aircel</td>
<td>17</td>
<td>1.6</td>
<td>90.6</td>
</tr>
<tr>
<td>MTS</td>
<td>22</td>
<td>2</td>
<td>92.6</td>
</tr>
<tr>
<td>Uninor</td>
<td>15</td>
<td>1.4</td>
<td>94</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>65</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>1080</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

3.3 Analysis of product differentiation strategies of BSNL and private sector mobile telecom service providers in Kerala

Hypothesis 1

There is significant difference between the product differentiation strategies of BSNL and private sector mobile telecom service providers in Kerala.

Variables considered for the analysis of product differentiation strategies

The variables considered for the analysis of product differentiation strategies of mobile telecom service providers in Kerala are: basic core service benefits, supplementary core service benefits, customer support services related to product availability, customer support services related customer care, the quality of service and the brand value.

The basic core service benefits are measured by the items voice clarity, geographical network coverage, and easiness to get connected to the network. The supplementary core benefits are measured by the items roaming facility and easiness in the activation of internet services. The customer support services related to
product availability comprises of easiness to get new mobile connection, availability of recharge facility at convenient locations, retailer support for the prepaid customers, convenience of payment of post-paid bills, and special care for the post-paid customers. The customer support services related customer care are measured by easiness to activate additional services, easiness to deactivate additional services - if required, easiness to access customer care helpline, easiness to get the right customer care person on the phone and ability to solve problems at customer care touch points. The service quality of mobile phone services is measured by the 22-item SERVQUAL scale. The brand value of mobile service providers is measured based on the concepts of Young and Rubicam’s Brand Asset Valuator (BAV).

All items of the variables are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree.

All the variables considered for the analysis of product differentiation strategies of mobile telecom service providers are separately tested with following hypotheses.

3.3.1 Basic core service benefits of mobile telecom services

The variable considered for the analysis is basic core service benefits of mobile telecom services. The items used to measure the variable basic core service benefits are: ‘The mobile connection provides excellent voice clarity’, ‘The mobile connection provides excellent geographical network coverage’, and ‘It is very easy to get connected to the network’.

Hypothesis 1.1

The delivery of basic core service benefits specifically voice clarity, geographical network coverage, and easiness to get connected to the network significantly differ between BSNL and private sector mobile telecom service providers in Kerala.
Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network (Easy to make or receive calls)’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network (Easy to make or receive calls)’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.1. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.1.

### Table 3.3.1
Mean ranking of core benefits delivered by mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Excellent voice clarity</th>
<th>Excellent geographical network coverage</th>
<th>Very easy to get connected to the network.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>264</td>
<td>417.67</td>
<td>482.37</td>
<td>398.83</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>429.43</td>
<td>461.91</td>
<td>460.37</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>433.38</td>
<td>399.62</td>
<td>414.35</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>490.75</td>
<td>346.22</td>
<td>502.58</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table 3.3.2 shows the test statistic for the Kruskal-Wallis test based on core benefits delivered by the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.3.2
Kruskal-Wallis test statistics based on core benefits delivered by mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent voice clarity</th>
<th>Excellent geographical network coverage</th>
<th>Very easy to get connected to the network (easy to make or receive calls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>10.961</td>
<td>40.325</td>
<td>23.063</td>
</tr>
<tr>
<td>Df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.012</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.3.3 shows the descriptive statistics of the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’ and ‘Very easy to get connected to the network’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.

Table 3.3.3
Descriptive statistics of core benefits delivered by mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Excellent voice clarity*</th>
<th>Excellent geographical network coverage*</th>
<th>Very easy to get connected to the network*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>4.13</td>
<td>.593</td>
<td>4.12</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>4.15</td>
<td>.669</td>
<td>4.00</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>4.20</td>
<td>.499</td>
<td>3.84</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>4.30</td>
<td>.691</td>
<td>3.56</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>4.18</td>
<td>.610</td>
<td>3.93</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree = 4, Strongly Agree=5; Mean Value of the Scale = 3.
The summary of Kruskal-Wallis test statistics shown in table 3.3.2 indicates that the significance value is 0.012 for the variable ‘Excellent voice clarity’, 0.00 for the variable ‘Excellent geographical network coverage’ and 0.00 for the variable ‘Very easy to get connected to the network’. These values are less than 0.05. Therefore, it can be concluded that the delivery of basic core service benefits specifically voice clarity, geographical network coverage, and easiness to get connected to the network significantly differ between BSNL and private sector telecom service providers in Kerala. The value of mean ranking based on Kruskal-Wallis test given in table 3.3.1 indicates that the mobile service provider Airtel has significantly higher levels of values in respect of the variables ‘Excellent voice clarity’ and ‘Very easy to get connected to the network’ than that of the other mobile service providers. In respect of the value of the variable ‘Very easy to get connected to the network’, the Airtel is followed by the service provider BSNL. The mobile service provider Idea has significantly higher levels in the value of the variable ‘Excellent geographical network coverage’, than the other mobile service providers. In respect of the geographical network coverage the Idea is followed by BSNL. The descriptive statistics of the variables given in the table 3.3.3 also agrees to these findings.

**Basic core service benefits of mobile telecom services: post hoc procedures for the Kruskal-Wallis test**

The Kruskal-Wallis test results shows that the delivery of basic core service benefits specifically voice clarity, geographical network coverage, and easiness to get connected to the network significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:
(1) Post hoc test 1: The Idea compared to the BSNL

(2) Post hoc test 2: The Vodafone compared to the BSNL

(3) Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^3\) is applied and the critical value of significance is computed as 0.0167.

1. **The Idea Compared to the BSNL: Mann-Whitney U test**

   The summary of ranked data corresponding to the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.4.

   **Table 3.3.4**
   
   Mean ranking of core benefits delivered by Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent voice clarity</td>
<td>Excellent geographical network coverage</td>
<td>Very easy to get connected to the network.</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>256.67</td>
<td>264.94</td>
<td>241.96</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>263.45</td>
<td>254.89</td>
<td>278.68</td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   The table 3.3.5 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ pertaining to the mobile service providers Idea and BSNL.

Table 3.3.5
Mann - Whitney U test statistics based on core benefits delivered by Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent voice clarity</th>
<th>Excellent geographical network coverage</th>
<th>Very easy to get connected to the network (easy to make or receive calls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>32781.000</td>
<td>32357.000</td>
<td>28897.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>67761.000</td>
<td>64997.000</td>
<td>63877.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.630</td>
<td>-.849</td>
<td>-3.143</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.529</td>
<td>.396</td>
<td>.002</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.5 indicates that the observed significance values of the variables ‘Excellent voice clarity’, and ‘Excellent geographical network coverage’ are greater than 0.0167, these variables do not significantly differ between the mobile service providers Idea and BSNL. But the observed significance values of the variable ‘Very easy to get connected to the network’ is less than 0.0167, it significantly differs between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.4 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Very easy to get connected to the network’ than Idea. So it can be concluded that BSNL is positively differentiated the core benefit characteristics ‘Very easy to get connected to the network’ from the mobile service provider Idea.

2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.6.
Table 3.3.6
Mean ranking of core benefits delivered by Vodafone and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent voice clarity</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>243.75</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>241.38</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.7 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ pertaining to the mobile service providers Vodafone and BSNL.

Table 3.3.7
Mann-Whitney U test statistics based on core benefits delivered by Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent voice clarity</th>
<th>Excellent geographical network coverage</th>
<th>Very easy to get connected to the network.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>28912.000</td>
<td>25031.500</td>
<td>26106.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>61552.000</td>
<td>51366.500</td>
<td>52441.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.227</td>
<td>-.3048</td>
<td>-.2256</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.820</td>
<td>.002</td>
<td>.024</td>
</tr>
<tr>
<td>Grouping Variable:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The summary of Mann – Whitney test statistics shown in table 3.3.7 indicates that the observed significance values of the variables ‘Excellent voice clarity’, and ‘Very easy to get connected to the network’ are greater than 0.0167, these variables do not significantly differ between the mobile service providers Vodafone and BSNL. But the observed significance values of the variable ‘Excellent geographical network coverage’ is less than 0.0167, it significantly differs between
the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.6 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent geographical network coverage’ than Vodafone. So it can be concluded that BSNL is positively differentiated the core benefit characteristics ‘Excellent geographical network coverage’ from the mobile service provider Vodafone.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.8.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th>Very easy to get connected to the network.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent voice clarity</td>
<td>Excellent geographical network coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>180.60</td>
<td>204.18</td>
<td>183.07</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>206.56</td>
<td>157.26</td>
<td>201.40</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.9 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent voice clarity’, ‘Excellent geographical network coverage’, and ‘Very easy to get connected to the network’ pertaining to the mobile service providers Airtel and BSNL.
Table 3.3.9
Mann-Whitney U test statistics based on core benefits delivered by Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent voice clarity</th>
<th>Excellent geographical network coverage</th>
<th>Very easy to get connected to the network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>13412.500</td>
<td>11683.000</td>
<td>14042.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>46052.500</td>
<td>19186.000</td>
<td>46682.500</td>
</tr>
<tr>
<td>Z</td>
<td>-2.540</td>
<td>-4.207</td>
<td>-1.680</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.011</td>
<td>.000</td>
<td>.093</td>
</tr>
</tbody>
</table>

The summary of Mann – Whitney test statistics shown in table 3.3.9 indicates that the observed significance values of the variable ‘Very easy to get connected to the network’ are greater than 0.0167, it does not significantly differ between the mobile service providers Airtel and BSNL. But the observed significance values of the variables ‘Excellent geographical network coverage’ and ‘Excellent voice clarity’ are less than 0.0167, these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.8 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent geographical network coverage’ than Airtel. So it can be concluded that BSNL is positively differentiated the core benefit characteristics ‘Excellent geographical network coverage’ from the mobile service provider Airtel. The value of mean ranking based on Mann-Whitney U test also indicates that the mobile service provider Airtel has significantly higher levels in the value of the variable ‘Excellent voice clarity’ than BSNL. So it can be concluded that Airtel is positively differentiated the core benefit characteristics ‘Excellent voice clarity’ from the mobile service provider BSNL.
3.3.2 Supplementary core benefits of mobile telecom services

The variable considered for the analysis is supplementary core benefits of mobile telecom services. The items used to measure the variable supplementary core benefits are: ‘The roaming facility is excellent’ and ‘It is very easy to activate internet services’.

Hypothesis 1.2

The delivery of supplementary core benefits specifically roaming facility and easiness to activate internet services significantly differ between BSNL and Private sector mobile telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.2. The Mann-Whitney U test is used for the non-parametric post hoc procedures

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.10.
Table 3.3.10
Mean ranking of supplementary core benefits delivered by mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent roaming facility</td>
<td>Very easy to activate internet services</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>396.94</td>
<td>432.59</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>514.22</td>
<td>412.45</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>392.08</td>
<td>406.86</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>435.91</td>
<td>543.73</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.11 shows the test statistic for the Kruskal-Wallis test based on supplementary core benefits delivered by the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.3.11
Kruskal-Wallis test statistics based on supplementary core benefits delivered by mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent roaming facility</th>
<th>Very easy to activate internet services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>44.231</td>
<td>32.808</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.3.12 shows the descriptive statistics of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.
Table 3.3.12
Descriptive statistics of supplementary core benefits delivered by mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Excellent roaming facility *</th>
<th>Very easy to activate internet services *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>3.39</td>
<td>.815</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>3.83</td>
<td>.800</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>3.40</td>
<td>.659</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>3.52</td>
<td>.845</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>3.54</td>
<td>.799</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.3.11 indicates that the significance value is 0.000 for the variables ‘Excellent roaming facility’, and ‘Very easy to activate internet services’. These values are less than 0.05. Therefore, it can be concluded that the delivery of supplementary core benefits specifically roaming facility and easiness to activate internet services significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.10 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent roaming facility’ than the other mobile service providers. The descriptive statistics of the variable ‘Excellent roaming facility’ given in the table 3.3.12 also indicate comparatively high value of mean for BSNL than the other mobile service providers.

The value of mean ranking based on Kruskal-Wallis test also indicates that the mobile service provider Airtel has significantly higher levels in the value of the variable ‘Very easy to activate internet services’ than the other mobile service providers. The descriptive statistics of the variable ‘Very easy to activate internet services’ given in the table 3.3.12 also agrees to this finding.
Supplementary core benefits of mobile telecom services: post hoc procedures for the Kruskal-Wallis test

The Kruskal-Wallis test results shows that the delivery of supplementary core benefits specifically roaming facility and easiness to activate internet services significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested in the post hoc analysis, in order to reduce the Type I error, Bonferroni correction is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.13.

---

Table 3.3.13
Mean ranking of supplementary core benefits delivered by Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent roaming</td>
<td>Very easy to activate internet services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>226.08</td>
<td>266.09</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>295.11</td>
<td>253.70</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.14 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Idea and BSNL.

Table 3.3.14
Mann - Whitney U test statistics based on supplementary core benefits delivered by Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent roaming facility</th>
<th>Very easy to activate internet services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>24706.000</td>
<td>32053.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>59686.000</td>
<td>64693.000</td>
</tr>
<tr>
<td>Z</td>
<td>-5.604</td>
<td>-1.028</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.304</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.14 indicates that the observed significance values of the variable ‘Very easy to activate internet services’ is greater than 0.0167, this variable does not significantly differ between the mobile service providers Idea and BSNL. But the observed significance values of the variable ‘Excellent roaming facility’ is less than 0.0167, it significantly differs between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.13 also indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent roaming facility’ than Idea. So it can be concluded that BSNL is
positively differentiated the supplementary core benefit characteristics ‘Excellent roaming facility’ from the mobile service provider Idea.

2. **The Vodafone compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.15.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent roaming facility</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>206.07</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>275.22</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.16 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Vodafone and BSNL.

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent roaming facility</th>
<th>Very easy to activate internet services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>20855.000</td>
<td>28945.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>47190.000</td>
<td>55280.500</td>
</tr>
<tr>
<td>Z</td>
<td>-5.865</td>
<td>-.181</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.856</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.3.16 indicates that the observed significance values of the variable ‘Very easy to activate internet services’ is greater than 0.0167, this variable does not significantly differ between the mobile service providers Vodafone and BSNL. But the observed significance values of the variable ‘Excellent roaming facility’ is less than 0.0167, it significantly differs between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.15 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent roaming facility’ than Vodafone. So it can be concluded that BSNL is positively differentiated the supplementary core benefit characteristics ‘Excellent roaming facility’ from the mobile service provider Vodafone.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.17.

Table 3.3.17
Mean ranking of supplementary core benefits delivered by Airtel and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excellent roaming facility</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>199.89</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>166.24</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
</tr>
</tbody>
</table>

|                         |    | Very easy to activate internet services |
| BSNL                    | 255| 171.27                          |
| Airtel                  | 122| 226.07                          |

The table 3.3.18 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ pertaining to the mobile service providers Airtel and BSNL.
Table 3.3.18
Mann-Whitney U test statistics based on supplementary core benefits delivered by Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Excellent roaming facility</th>
<th>Very easy to activate internet services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>12778.500</td>
<td>11033.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>20281.500</td>
<td>43673.000</td>
</tr>
<tr>
<td>Z</td>
<td>-2.994</td>
<td>-4.872</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.003</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.18 indicates that the observed significance values of the variables ‘Excellent roaming facility’ and ‘Very easy to activate internet services’ are less than 0.0167, these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.17 indicates that the mobile service provider BSNL has significantly higher levels in the value of the variable ‘Excellent roaming facility’ than Airtel. So it can be concluded that BSNL is positively differentiated the supplementary benefit characteristics ‘Excellent roaming facility’ from the mobile service provider Airtel.

The value of mean ranking also indicates that the mobile service provider Airtel has significantly higher levels in the value of the variable ‘Very easy to activate internet services’ than BSNL. So it can be concluded that Airtel is positively differentiated the supplementary benefit characteristics ‘Very easy to activate internet services’ from the mobile service provider BSNL.

3.3.3 Customer support related to product availability of prepaid mobile telecom services

The variable considered for the analysis is the customer support related to product availability of prepaid mobile telecom services. The items used to measure the variable are: ‘It is very easy to get a new mobile connection’, ‘The mobile
service recharge facility / recharge cards are available at convenient locations’, and ‘The retailers of the service provider extend helpful customer support’.

**Hypothesis 1.3**

The customer support services specifically easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.3. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.19.
Table 3.3.19
Mean ranking of customer support (product availability) of prepaid mobile telecom services based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get new mobile connection</td>
<td>Prepaid recharge available at convenient locations</td>
<td>Retailer support</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>449.14</td>
<td>406.41</td>
<td>474.78</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>215.41</td>
<td>334.33</td>
<td>195.28</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>454.92</td>
<td>405.63</td>
<td>463.02</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>470.86</td>
<td>398.79</td>
<td>444.11</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.20 shows the test statistic for the Kruskal-Wallis test based on customer support related to the product availability of prepaid services extended by the mobile telecom service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.3.20
Kruskal-Wallis test statistics based on customer support (product availability) of prepaid mobile telecom services

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Prepaid recharge available at convenient locations</th>
<th>Retailers extend customer support for prepaid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>230.985</td>
<td>21.128</td>
<td>273.238</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Grouping Variable: Mobile Service Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.21 shows the descriptive statistics of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.
Table 3.3.21
Descriptive statistics of customer support (product availability)
of prepaid mobile telecom services

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Very easy to get new mobile connection and *</th>
<th>Prepaid recharge available at convenient locations*</th>
<th>Retailer support*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>4.52</td>
<td>.574</td>
<td>4.57</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>3.53</td>
<td>.904</td>
<td>4.26</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>4.53</td>
<td>.617</td>
<td>4.56</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>4.59</td>
<td>.566</td>
<td>4.50</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>4.24</td>
<td>.836</td>
<td>4.46</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.3.20 indicates that the significance value is 0.000 for the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’. These values are less than 0.05. Therefore, it can be concluded that the customer support services specifically easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.19 indicates that the private sector telecom service providers have significantly higher levels in the value of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’, and ‘Retailer support’ than BSNL. The descriptive statistics of the variables given in the table 3.3.21 also agrees to these findings.

Customer support related to product availability of prepaid mobile telecom services: post hoc procedures for the Kruskal-Wallis test

The Kruskal-Wallis test results shows that the customer support services specifically easiness to get new mobile connection, availability of recharge facility
at convenient locations and retailer support for the prepaid customers significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.22.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get new mobile connection</td>
<td>Prepaid recharge available at convenient locations</td>
<td>Retailers extend customer support for prepaid customers</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>300.86</td>
<td>251.82</td>
<td>313.36</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>159.45</td>
<td>208.27</td>
<td>147.00</td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.3.22
Mean ranking of customer support (product availability) of prepaid mobile telecom services of Idea and BSNL based on Mann-Whitney U test

---

The table 3.3.23 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Idea and BSNL.

**Table 3.3.23**

*Mann - Whitney U test statistics based on customer support (product availability) of prepaid mobile telecom services of Idea and BSNL*

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Prepaid recharge available at convenient locations</th>
<th>Retailer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>10107.500</td>
<td>21337.500</td>
<td>7246.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>36672.500</td>
<td>47902.500</td>
<td>33811.000</td>
</tr>
<tr>
<td>Z</td>
<td>-12.559</td>
<td>-3.977</td>
<td>-14.145</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.23 indicates that the observed significance values of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.22 indicates that the mobile service provider Idea has significantly higher levels of values of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ than BSNL. So it can be concluded that Idea has positively differentiated the customer support services specifically easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers from the mobile service provider BSNL.
2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.24.

**Table 3.3.24**

Mean ranking of customer support (product availability) of prepaid mobile telecom services of Vodafone and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get new mobile connection</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>287.01</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>153.32</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.25 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Vodafone and BSNL.

**Table 3.3.25**

Mann - Whitney U test statistics based on customer support (product availability) of prepaid mobile telecom services of Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Prepaid recharge available at convenient locations</th>
<th>Retailer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>8697.500</td>
<td>18722.500</td>
<td>7169.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>35262.500</td>
<td>45287.500</td>
<td>33734.000</td>
</tr>
<tr>
<td>Z</td>
<td>-12.163</td>
<td>-3.744</td>
<td>-12.890</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann–Whitney U test statistics shown in table 3.3.25 indicates that the observed significance values of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ are less than 0.0167. Therefore, these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney U test given in table 3.3.24 indicates that the mobile service provider Vodafone has significantly higher levels of values for all these variables than that of BSNL. So it can be concluded that Vodafone has positively differentiated the customer support services specifically easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers from the mobile service provider BSNL.

3. **The Airtel compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.26.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get</td>
<td>Prepaid recharge</td>
<td>Retailer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>new mobile connection</td>
<td>available at</td>
<td>support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>convenient locations</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>133.65</td>
<td>160.16</td>
<td>132.61</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>245.00</td>
<td>188.00</td>
<td>247.23</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.27 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ pertaining to the mobile service providers Airtel and BSNL.
Table 3.3.27
Mann - Whitney U test statistics based on customer support (product availability) of prepaid mobile telecom services of Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Prepaid recharge available at convenient locations</th>
<th>Retailer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>4173.500</td>
<td>10271.500</td>
<td>3934.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>30738.500</td>
<td>36836.500</td>
<td>30499.500</td>
</tr>
<tr>
<td>Z</td>
<td>-10.744</td>
<td>-2.725</td>
<td>-10.556</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.006</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.27 indicates that the observed significance values of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.26 indicates that the mobile service provider Airtel has significantly higher levels of values of the variables ‘Very easy to get new mobile connection’, ‘Prepaid recharge available at convenient locations’ and ‘Retailer support’ than BSNL. So it can be concluded that Airtel has positively differentiated the customer support services specifically easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers from the mobile service provider BSNL.

3.3.4 Customer support related to product availability of post-paid mobile telecom services

The variable considered for the analysis is the customer support related to product availability of post-paid mobile telecom services. The items used to measure the variable are: ‘It is very easy to get a new mobile connection’, ‘The payment of bills can be done conveniently’ and ‘The post-paid customers are getting special care from the service provider’.
Hypothesis 1.4

The customer support services specifically easiness to get new mobile connection, convenience of payment of post-paid bills and special care for the post-paid customers significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.4. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.28.
Table 3.3.28
Mean ranking of customer support (product availability) of post-paid mobile telecom services based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>35</td>
<td>56.80</td>
<td>49.00</td>
<td>60.31</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>29.04</td>
<td>47.60</td>
<td>18.66</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>61.72</td>
<td>66.86</td>
<td>70.55</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>63.73</td>
<td>41.07</td>
<td>55.77</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.29 shows the test statistic for the Kruskal-Wallis test based on customer support (product availability) of post-paid services extended by the mobile telecom service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.3.29
Kruskal-Wallis test statistics based on customer support (product availability) of post-paid mobile telecom services

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>26.218</td>
<td>12.619</td>
<td>49.391</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.006</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.3.30 shows the descriptive statistics of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.
Table 3.3.30

Descriptive statistics of customer support (product availability) of post-paid mobile telecom services

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>35</td>
<td>4.49</td>
<td>.507</td>
<td>4.26</td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>3.80</td>
<td>.577</td>
<td>4.28</td>
</tr>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>4.59</td>
<td>.501</td>
<td>4.79</td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>4.60</td>
<td>.632</td>
<td>4.27</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>4.37</td>
<td>.624</td>
<td>4.41</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.3.29 indicates that the significance value is 0.000 for the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’. The significance value is 0.006 for the variable ‘Post-paid bill payment is convenient’. These values are less than 0.05. Therefore, it can be concluded that the customer support services specifically easiness to get new mobile connection, convenience of payment of post-paid bills and special care for the post-paid customers significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.28 indicates that the private sector telecom service providers have significantly higher levels in the values of the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’ than BSNL. The descriptive statistics of the variables given in the table 3.3.30 also agrees to these findings. The value of mean ranking also indicates that Vodafone has significantly higher levels in the value of the variable ‘Post-paid bill payment is convenient’ than the other mobile telecom service providers. The descriptive statistics of the variable also agrees to this finding.
Customer support related to product availability of post-paid mobile telecom services: post hoc procedures for the Kruskal-Wallis test

The Kruskal-Wallis test results shows that the customer support services specifically easiness to get new mobile connection, convenience of payment of post-paid bills and special care for the post-paid customers significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.31.

---

Table 3.3.31

Mean ranking of customer support (product availability) of post-paid mobile telecom services of Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get new mobile connection</td>
</tr>
<tr>
<td>Idea</td>
<td>35</td>
<td>37.36</td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>20.90</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.32 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Idea and BSNL.

Table 3.3.32

Mann - Whitney U test statistics based on customer support (product availability) of post-paid mobile telecom services of Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>197.500</td>
<td>427.500</td>
<td>81.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>522.500</td>
<td>752.500</td>
<td>406.000</td>
</tr>
<tr>
<td>Z</td>
<td>-4.188</td>
<td>-.166</td>
<td>-5.551</td>
</tr>
<tr>
<td>Asympt. Sig. (2-tailed)</td>
<td>.000</td>
<td>.868</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.32 indicates that the observed significance value of the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in
Table 3.3.31 indicates that the mobile service provider Idea has significantly higher levels of values of the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’ than BSNL. So it can be concluded that Idea has positively differentiated the customer support services specifically ‘Easiness to get new mobile connection’ and ‘Special care for the post-paid customers’ from the mobile service provider BSNL. As the observed significance value of the variable ‘Post-paid bill payment is convenient’ is greater than 0.0167, the variable does not significantly differ between the mobile service providers Idea and BSNL.

2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.33.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to get new mobile connection</td>
<td>Post-paid bill payment is convenient</td>
<td>Special care for post-paid customers</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>35.36</td>
<td>32.12</td>
<td>38.41</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>18.38</td>
<td>22.14</td>
<td>14.84</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.34 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Vodafone and BSNL.
Table 3.3.34
Mann - Whitney U test statistics based on customer support (product availability) of post-paid mobile telecom services of Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>134.500</td>
<td>228.500</td>
<td>46.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>459.500</td>
<td>553.500</td>
<td>371.000</td>
</tr>
<tr>
<td>Z</td>
<td>-4.497</td>
<td>-2.752</td>
<td>-5.674</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.006</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.34 indicates that the observed significance values of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.33 indicates that the mobile service provider Vodafone has significantly higher levels of values for these variables than BSNL. So it can be concluded that Vodafone has positively differentiated the customer support services specifically ‘Easiness to get new mobile connection’, ‘Convenience of payment of post-paid bills’ and ‘Special care for the post-paid customers’ from the mobile service provider BSNL.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.35.
Table 3.3.35
Mean ranking of customer support (product availability) of post-paid mobile telecom services of Airtel and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>25</td>
<td>15.76</td>
<td>21.36</td>
<td>13.58</td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>28.40</td>
<td>19.07</td>
<td>32.03</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.36 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to get new mobile connection’, ‘Post-paid bill payment is convenient’ and ‘Special care for post-paid customers’ pertaining to the mobile service providers Airtel and BSNL.

Table 3.3.36
Mann - Whitney U test statistics based on customer support (product availability) of post-paid mobile telecom services of Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to get new mobile connection</th>
<th>Post-paid bill payment is convenient</th>
<th>Special care for post-paid customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>69.000</td>
<td>166.000</td>
<td>14.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>394.000</td>
<td>286.000</td>
<td>339.500</td>
</tr>
<tr>
<td>Z</td>
<td>-3.730</td>
<td>-.690</td>
<td>-5.125</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.490</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.36 indicates that the observed significance values of the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.35 indicates that the mobile service provider Airtel has significantly higher
levels of values of the variables ‘Very easy to get new mobile connection’ and ‘Special care for post-paid customers’ than BSNL. So it can be concluded that Airtel has positively differentiated the customer support services specifically ‘Easiness to get new mobile connection’ and ‘Special care for the post-paid customers’ from the mobile service provider BSNL. As the observed significance value of the variable ‘Post-paid bill payment is convenient’ is greater than 0.0167, the variable does not significantly differ between the mobile service providers Airtel and BSNL.

3.3.5 Customer care services of mobile telecom service providers

The variable considered for the analysis is the customer care services of mobile telecom service providers. The items used to measure the variable are: ‘Activation of additional services can be done very easily’, ‘Deactivation of additional services, if required, can be done very easily’, ‘It is very easy to access customer care helpline’, ‘It is easy to get the right customer care person on the phone’, and ‘The ability to solve problems at customer care is excellent’.

Hypothesis 1.5

The customer care services specifically easiness to activate additional services, easiness to deactivate additional services - if required, easiness to access customer care helpline, easiness to get the right customer care person on the phone and ability to solve problems at customer care significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.
Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.5. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.37.

Table 3.3.37
Mean ranking of customer care services of mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to activate additional services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very easy to deactivate additional services, if required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very easy to access customer care helpline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very easy to get the right customer care person on the phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solve problems at customer care</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>463.60 385.55 443.64 398.42 424.14</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>350.18 451.31 367.67 450.93 429.26</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>494.11 460.62 474.40 417.40 443.29</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>443.02 463.38 486.65 517.48 458.51</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
</tr>
</tbody>
</table>
The table 3.3.38 shows the test statistic for the Kruskal-Wallis test based on customer care services of the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

### Table 3.3.38
Kruskal-Wallis test statistics based on customer care services of mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to activate additional services</th>
<th>Very easy to deactivate additional services, if required</th>
<th>Very easy to access customer care helpline</th>
<th>Very easy to get the right customer care person on the phone</th>
<th>Solve problems at customer care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>57.029</td>
<td>17.828</td>
<td>33.514</td>
<td>24.722</td>
<td>2.306</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.511</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.3.39 shows the descriptive statistics of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.

### Table 3.3.39
Descriptive statistics of customer care services of mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Very easy to activate additional services *</th>
<th>Very easy to deactivate additional services-if required *</th>
<th>Very easy to access customer care helpline *</th>
<th>Very easy to get the right customer care person on the phone *</th>
<th>Ability to solve problems at customer care *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>4.27</td>
<td>.663</td>
<td>3.20</td>
<td>.873</td>
<td>3.55</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>3.91</td>
<td>.716</td>
<td>3.46</td>
<td>.757</td>
<td>3.19</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>4.36</td>
<td>.596</td>
<td>3.47</td>
<td>.809</td>
<td>3.69</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>4.20</td>
<td>.667</td>
<td>3.46</td>
<td>1.022</td>
<td>3.71</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>4.18</td>
<td>.685</td>
<td>3.39</td>
<td>.854</td>
<td>3.50</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.
The summary of Kruskal-Wallis test statistics shown in table 3.3.38 indicates that the significance value is 0.000 for the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, and ‘Very easy to get the right customer care person on the phone’. These values are less than 0.05. Therefore, it can be concluded that the customer care services specifically easiness to activate additional services, easiness to deactivate additional services - if required, easiness to access customer care helpline, and easiness to get the right customer care person on the phone significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value is 0.511 for the variable ‘Ability to solve problems at customer care’. As it is greater than 0.05, it can be concluded that the customer care services specifically ‘Ability to solve problems at customer care’ doesn’t significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.37 indicates that the private sector telecom service providers have significantly higher levels in the values of the variables ‘Very easy to activate additional services’, and ‘Very easy to access customer care helpline’ than BSNL. The value of mean ranking also indicates that mobile telecom service providers BSNL, Vodafone and Airtel have significantly higher levels in the values of the variable ‘Very easy to deactivate additional services-if required’ than the mobile telecom service provider Idea. It can also be observed that the value of mean ranking is significantly higher for the service providers Airtel and BSNL in respect of the variable ‘Very easy to get the right customer care person on the phone’ than the mobile telecom service providers Vodafone and Idea. The descriptive statistics of the variables given in the table 3.3.39 also agrees to these findings.

The Kruskal-Wallis test results shows that a difference exists; it doesn’t show where the difference lie. Hence Mann-Whitney test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL.
Customer care services of mobile telecom service providers: post hoc procedures for the Kruskal-Wallis test.

The Kruskal-Wallis test results shows that the customer care services specifically easiness to activate additional services, easiness to deactivate additional services - if required, easiness to access customer care helpline, easiness to get the right customer care person on the phone and ability to solve problems at customer care significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

(1) Post hoc test 1: The Idea compared to the BSNL
(2) Post hoc test 2: The Vodafone compared to the BSNL
(3) Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^7\) is applied and the critical value of significance is computed as 0.0167.

1. **The Idea compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.40.

---

Table 3.3.40
Mean ranking of customer care services of Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to activate additional services</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>293.05</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>225.78</td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.41 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to the mobile service providers Idea and BSNL.

Table 3.3.41
Mann - Whitney U test statistics based on customer care services of Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to activate additional services</th>
<th>Very easy to deactivate additional services, if required</th>
<th>Very easy to access customer care helpline</th>
<th>Very easy to get the right customer care person on the phone</th>
<th>Solve problems at customer care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>24934.000</td>
<td>28310.000</td>
<td>27621.000</td>
<td>29627.500</td>
<td>33252.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>57574.000</td>
<td>63290.000</td>
<td>60261.000</td>
<td>64607.500</td>
<td>68232.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.5730</td>
<td>-.3368</td>
<td>-.3774</td>
<td>-.2574</td>
<td>-.261</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.001</td>
<td>.000</td>
<td>.010</td>
<td>.794</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.3.41 indicates that the observed significance values of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’ and ‘Very easy to get the right customer care person on the phone’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL.

The value of mean ranking based on Mann-Whitney test given in table 3.3.40 indicates that the mobile service provider Idea has significantly higher levels of values of the variables ‘Very easy to activate additional services’ and ‘Very easy to access customer care helpline’ than BSNL. The mobile service provider BSNL has significantly higher levels of values of mean ranking of the variables ‘Very easy to deactivate additional services, if required’ and ‘Very easy to get the right customer care person on the phone’ than the Idea. So it can be concluded that Idea has positively differentiated the customer care services specifically ‘Easiness to activate additional services’ and ‘Easiness to access customer care helpline’ from the mobile service provider BSNL. Same time BSNL has positively differentiated the customer care services specifically ‘Easiness to deactivate additional services - if required’ and ‘Easiness to get the right customer care person on the phone’ from the mobile service provider Idea.

The significance value is 0.794 for the variable ‘Ability to solve problems at customer care’. As the value is greater than 0.0167, it can be concluded that the customer care services specifically ‘Ability to solve problems at customer care’ doesn’t significantly differ between BSNL and Idea.

2. **The Vodafone compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.42.
Table 3.3.42
Mean ranking of customer care services of Vodafone and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Very easy to activate additional services</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>284.80</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>204.51</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.43 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to the mobile service providers Vodafone and BSNL.

Table 3.3.43
Mann-Whitney U test statistics based on customer care services of Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to activate additional services</th>
<th>Very easy to deactivate additional services, if required</th>
<th>Very easy to access customer care helpline</th>
<th>Very easy to get the right customer care person on the phone</th>
<th>Solve problems at customer care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>19511.000</td>
<td>28426.000</td>
<td>22064.000</td>
<td>26959.500</td>
<td>28259.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>52151.000</td>
<td>61066.000</td>
<td>54704.000</td>
<td>53294.500</td>
<td>60899.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.710</td>
<td>-.554</td>
<td>-4.917</td>
<td>-1.581</td>
<td>-.670</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.579</td>
<td>.000</td>
<td>.114</td>
<td>.503</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.3.43 indicates that the observed significance values of the variables ‘Very easy to activate additional services’ and ‘Very easy to access customer care helpline’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.42 indicates that the mobile service provider Vodafone has significantly higher levels of values for these variables than BSNL. So it can be concluded that Vodafone has positively differentiated the customer care services specifically ‘Easiness to activate additional services’ and ‘Easiness to access customer care helpline’ from the mobile service provider BSNL.

The significance values are 0.579 for the variable ‘Very easy to deactivate additional services - if required’, 0.114 for the variable ‘Very easy to get the right customer care person on the phone’, and 0.503 for the variable ‘Solve problems at customer care’. As these values are greater than 0.0167, it can be concluded that the customer care services specifically ‘Easiness to deactivate additional services - if required’, ‘Easiness to get the right customer care person on the phone’ and ‘Ability to solve problems at customer care’ do not significantly differ between BSNL and Vodafone.

3. **The Airtel compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.44.
Table 3.3.44  
Mean ranking of customer care services of Airtel and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Very easy to activate additional services</th>
<th>Very easy to deactivate additional services, if required</th>
<th>Very easy to access customer care helpline</th>
<th>Very easy to get the right customer care person on the phone</th>
<th>Solve problems at customer care</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>255</td>
<td>175.89</td>
<td>186.86</td>
<td>172.82</td>
<td>179.84</td>
<td>184.84</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>216.41</td>
<td>193.48</td>
<td>222.81</td>
<td>208.16</td>
<td>197.70</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.45 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Very easy to activate additional services’, ‘Very easy to deactivate additional services-if required’, ‘Very easy to access customer care helpline’, ‘Very easy to get the right customer care person on the phone’, and ‘Ability to solve problems at customer care’ pertaining to mobile service providers Airtel and BSNL.

Table 3.3.45  
Mann - Whitney U test statistics based on customer care services of Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Very easy to activate additional services</th>
<th>Very easy to deactivate additional services, if required</th>
<th>Very easy to access customer care helpline</th>
<th>Very easy to get the right customer care person on the phone</th>
<th>Solve problems at customer care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>12211.000</td>
<td>15008.500</td>
<td>11430.000</td>
<td>13218.000</td>
<td>14493.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>44851.000</td>
<td>47648.500</td>
<td>44070.000</td>
<td>45858.000</td>
<td>47133.500</td>
</tr>
<tr>
<td>Z</td>
<td>-3.836</td>
<td>-5.99</td>
<td>-4.403</td>
<td>-2.543</td>
<td>-1.166</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.549</td>
<td>.000</td>
<td>.011</td>
<td>.243</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann–Whitney test statistics shown in table 3.3.45 indicates that the observed significance values of the variables ‘Very easy to activate additional services’, ‘Very easy to access customer care helpline’ and ‘Very easy to get the right customer care person on the phone’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.44 indicates that the mobile service provider Airtel has significantly higher levels of values for these variables than BSNL. So it can be concluded that Airtel has positively differentiated the customer care services specifically ‘Easiness to activate additional services’, ‘Easiness to access customer care helpline’ and ‘Easiness to get the right customer care person on the phone’ from the mobile service provider BSNL.

The significance values are 0.549 for the variable ‘Very easy to deactivate additional services, if required’, and 0.243 for the variable ‘Solve problems at customer care’. As these values are greater than 0.0167, it can be concluded that the customer care services specifically ‘Easiness to deactivate additional services - if required’, and ‘Ability to solve problems at customer care’ do not significantly differ between BSNL and Airtel.

### 3.3.6 Quality of service of mobile telecom service providers

The variable considered for the analysis is the quality of service of mobile telecom service providers. It is measured by the 22-item SERVQUAL scale developed by Parasuraman A. et al. (1991)\(^8\). The items in SERVQUAL scale is grouped into the five distinct dimensions: Tangibility, Reliability, Responsiveness, Assurance and Empathy. In the guidelines for usage of this scale, it is suggested that, since the SERVQUAL is the basic skeleton underlying service quality, it should be used in its entirety as much as possible, but minor modifications in the wording of items to adapt them to a specific setting are appropriate. The items modified to the specific settings of mobile telecom services, grouped under the five dimensions are given below.

---

Tangibility

1. My service provider has modern Facilities for the customers.

2. The physical facilities provided by the service provider are visually appealing.

3. The employees of my service provider have a neat and professional appearance.

4. Pamphlets, brochures, materials associated with the services are visually appealing.

Reliability

5. My service provider fulfills its promises.

6. When you have problems, the service provider is sympathetic and reassuring.

7. My service provider is dependable.

8. My service provider provides the services at the time it promises to do so.

9. My service provider keeps its records accurately.

Responsiveness

10. Employees of the service provider will intimate the customers exactly when services will be performed.

11. Employees will provide prompt services to the customers.

12. Employees are always willing to help the customers.

13. Employees are always ready to respond to the customers’ requests.

Assurance

14. Customers can trust employees of the service provider.

15. Customers feel comfortable interacting with employees.

16. The employees are polite to the customers.

17. Employees have knowledge to answer customers’ queries.
Empathy

18. My service provider gives individual attention to the customers.

19. The employees give personal attention to the customers.

20. The employees of service provider do understand the needs of the customers.

21. Having the customers’ best interest at heart.

22. My service provider has operating hours convenient to the customers.

All items are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of respective dimensions of service quality.

Hypothesis 1.6

The dimensions of quality of service, specifically tangibility, reliability, responsiveness, assurance and empathy significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Tangibility’, ‘Reliability’, ‘Responsiveness’, ‘Assurance’ and ‘Empathy’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Tangibility’, ‘Reliability’, ‘Responsiveness’, ‘Assurance’ and ‘Empathy’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.6. The Mann-Whitney U test is used for the non-parametric post hoc procedures.
Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Tangibility’, ‘Reliability’, ‘Responsiveness’, ‘Assurance’ and ‘Empathy’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.46.

Table 3.3.46
Mean ranking of quality of service of mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>264</td>
<td>439.36</td>
<td>405.53</td>
<td>440.29</td>
<td>428.25</td>
<td>411.65</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>354.31</td>
<td>454.02</td>
<td>361.14</td>
<td>420.54</td>
<td>409.66</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>508.25</td>
<td>451.01</td>
<td>489.97</td>
<td>474.81</td>
<td>474.71</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>460.30</td>
<td>432.52</td>
<td>478.32</td>
<td>408.68</td>
<td>467.53</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.47 shows the test statistic for the Kruskal-Wallis test based on quality of service of the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.3.47
Kruskal-Wallis test statistics based on quality of service of mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>48.095</td>
<td>6.127</td>
<td>37.346</td>
<td>8.352</td>
<td>12.758</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.106</td>
<td>.000</td>
<td>.039</td>
<td>.005</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

Table 3.3.48

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>264</td>
<td>3.80</td>
<td>.506</td>
<td>3.69</td>
<td>.608</td>
<td>3.76</td>
<td>.654</td>
<td>3.85</td>
<td>.580</td>
<td>3.50</td>
<td>.628</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>3.69</td>
<td>.527</td>
<td>3.82</td>
<td>.549</td>
<td>3.55</td>
<td>.717</td>
<td>3.82</td>
<td>.635</td>
<td>3.49</td>
<td>.676</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>4.00</td>
<td>.598</td>
<td>3.76</td>
<td>.616</td>
<td>3.87</td>
<td>.725</td>
<td>3.94</td>
<td>.635</td>
<td>3.66</td>
<td>.662</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>3.89</td>
<td>.525</td>
<td>3.76</td>
<td>.582</td>
<td>3.87</td>
<td>.622</td>
<td>3.82</td>
<td>.562</td>
<td>3.65</td>
<td>.588</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>3.85</td>
<td>.553</td>
<td>3.76</td>
<td>.591</td>
<td>3.74</td>
<td>.700</td>
<td>3.86</td>
<td>.610</td>
<td>3.56</td>
<td>.650</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.3.47 indicates that the significance value is 0.000 for the variables Tangibility and Responsiveness, 0.039 for the variable Assurance and 0.005 for the variable Empathy. These values are less than 0.05. Therefore, it can be concluded that the factors of quality of service specifically tangibility, responsiveness, assurance and empathy significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value of the variable Reliability is 0.106. As this value is greater than 0.05, it can be concluded that the Reliability factor of quality of service does not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.46 indicates that the private sector telecom service providers have significantly higher levels in the values of the variables Tangibility and Responsiveness than BSNL. The value of mean ranking also indicates that quality of service factor assurance is more for Vodafone than other telecom service providers. The mean ranking of values of the variable empathy is higher for Vodafone and Airtel than Idea and BSNL. The descriptive statistics of the variables given in the table 3.3.48 also agrees to these findings.
Quality of service of mobile telecom service providers: post hoc procedures for the Kruskal-Wallis test.

The Kruskal-Wallis test results shows that the factors of quality of service, specifically tangibility, reliability, responsiveness, assurance and empathy significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

(1) Post hoc test 1: The Idea compared to the BSNL
(2) Post hoc test 2: The Vodafone compared to the BSNL
(3) Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction⁹ is applied and the critical value of significance is computed as 0.0167.

1. **The Idea compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables tangibility, reliability, responsiveness, assurance and empathy of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.49.

---

Table 3.3.49
Mean ranking of quality of service of Idea and BSNL based on
Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Quality of service -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tangibility</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>286.45</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>232.61</td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.50 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables tangibility, reliability, responsiveness, assurance and empathy pertaining to the mobile service providers Idea and BSNL.

Table 3.3.50
Mann - Whitney U test statistics based on quality of service of Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>26676.000</td>
<td>29914.500</td>
<td>27260.000</td>
<td>33007.000</td>
<td>33312.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>59316.000</td>
<td>64894.500</td>
<td>59900.000</td>
<td>65647.000</td>
<td>65952.000</td>
</tr>
<tr>
<td>Z</td>
<td>-4.137</td>
<td>-2.210</td>
<td>-3.781</td>
<td>-.388</td>
<td>-.205</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.027</td>
<td>.000</td>
<td>.698</td>
<td>.838</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.50 indicates that the observed significance values of the variables Tangibility and Responsiveness are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.49 indicates that the mobile service provider Idea has significantly higher levels of values of the variables Tangibility and Responsiveness than BSNL. The significance value of the variables Reliability,
Assurance and Empathy are greater than 0.0167. Therefore it can be concluded that the quality of service factors specifically Reliability, Assurance, and Empathy do not significantly differ between BSNL and Idea.

2. **The Vodafone compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables, reliability, responsiveness, assurance and empathy of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.51

**Table 3.3.51**

Mean ranking of quality of service of Vodafone and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>285.83</td>
<td>241.81</td>
<td>278.74</td>
<td>257.76</td>
<td>260.57</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>203.59</td>
<td>243.12</td>
<td>209.95</td>
<td>228.79</td>
<td>226.27</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.52 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables tangibility, reliability, responsiveness, assurance and empathy pertaining to the mobile service providers Vodafone and BSNL.

**Table 3.3.52**

Mann - Whitney U test statistics based on quality of service of Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>19275.500</td>
<td>29039.000</td>
<td>20898.000</td>
<td>25702.500</td>
<td>25059.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>51915.500</td>
<td>55374.000</td>
<td>53538.000</td>
<td>58342.500</td>
<td>57699.500</td>
</tr>
<tr>
<td>Z</td>
<td>-6.523</td>
<td>-.104</td>
<td>-.5442</td>
<td>-2.297</td>
<td>-2.707</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.917</td>
<td>.000</td>
<td>.022</td>
<td>.007</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann–Whitney test statistics shown in table 3.3.52 indicates that the observed significance values of the variables Tangibility, Responsiveness and Empathy are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.51 indicates that the mobile service provider Vodafone has significantly higher levels of values of the variables Tangibility, Responsiveness and Empathy than BSNL. The significance value of the variables Reliability and Assurance are greater than 0.0167. Therefore it can be concluded that the quality of service factors specifically Reliability and Assurance, do not significantly differ between BSNL and Vodafone.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables tangibility, reliability, responsiveness, assurance and empathy of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.53.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airtel</td>
<td>122</td>
<td>220.13</td>
<td>182.28</td>
<td>223.95</td>
<td>186.27</td>
<td>206.24</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>174.11</td>
<td>192.21</td>
<td>172.28</td>
<td>190.31</td>
<td>180.75</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.54 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables tangibility, reliability, responsiveness, assurance and empathy pertaining to the mobile service providers Airtel and BSNL.
Table 3.3.54
Mann - Whitney U test statistics based on quality of service of Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Quality of service - Tangibility</th>
<th>Quality of service - Reliability</th>
<th>Quality of service - Responsiveness</th>
<th>Quality of service - Assurance</th>
<th>Quality of service - Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>11757.000</td>
<td>14735.500</td>
<td>11291.500</td>
<td>15222.000</td>
<td>13451.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>44397.000</td>
<td>22238.500</td>
<td>43931.500</td>
<td>22725.000</td>
<td>46091.500</td>
</tr>
<tr>
<td>Z</td>
<td>-3.878</td>
<td>-.834</td>
<td>-4.343</td>
<td>-.340</td>
<td>-2.135</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.405</td>
<td>.000</td>
<td>.734</td>
<td>.033</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.54 indicates that the observed significance values of the variables Tangibility and Responsiveness are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.53 indicates that the mobile service provider Airtel has significantly higher levels in the values of the variables Tangibility and Responsiveness than BSNL. The significance value of the variables Reliability, Assurance, and Empathy are greater than 0.0167. Therefore it can be concluded that the quality of service factors specifically Reliability, Assurance and Empathy, do not significantly differ between BSNL and Airtel.

3.3.7 Brand value of mobile telecom service providers

The brand value of mobile telecom service providers are measured by Young and Rubicam’s Brand Asset Valuator (BAV). As cited by Kevin Lane Keller (2008)\textsuperscript{10}, BAV measures brands on five fundamental measures of equity value and in terms of a broad array of perceptual dimensions. The five key components in BAV are: (i) Differentiation - measures the degree to which a brand is seen as

different from others. (ii) Energy - measures the brand’s ability to meet future consumer needs and attract new customers. (iii) Relevance - measures the breadth of a brands’ appeal, but not necessarily its profitability. (iv) Esteem - measures how well the brand is regarded and respected – in short, how well it’s liked. (v) Knowledge - measures how familiar and intimate consumers are with brand. Based on BAV model following items are formulated to measure the brand value.

1. My service provider established a brand which is distinctive from other operators.
2. My service provider established a brand which always making the difference relevant from other operators.
3. My service provider established a brand which is popularly regarded and respected.
4. My service provider established a brand which is well-known and reflected as a successful outcome.

All items are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean score of brand value.

**Hypothesis 1.7**

The brand value significantly differs between BSNL and private sector mobile telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variable ‘Brand value’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variable ‘Brand value’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have
homogeneous variances. Even though the groups have homogeneous variances, the data are not normally distributed. Therefore the Kruskal-Wallis test is used to test the Hypothesis 1.7. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variable ‘Brand value’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.3.55.

**Table 3.3.55**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand value</td>
<td>Idea</td>
<td>264</td>
<td>396.30</td>
</tr>
<tr>
<td></td>
<td>BSNL</td>
<td>255</td>
<td>476.03</td>
</tr>
<tr>
<td></td>
<td>Vodafone</td>
<td>229</td>
<td>471.77</td>
</tr>
<tr>
<td></td>
<td>Airtel</td>
<td>122</td>
<td>367.52</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>870</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.56 shows the test statistic for the Kruskal-Wallis test based on the brand value of the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

**Table 3.3.56**

<table>
<thead>
<tr>
<th>Details</th>
<th>Brand value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>27.257</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The table 3.3.57 shows the descriptive statistics of the variable ‘Brand value’ related to the mobile service providers Idea, BSNL, Vodafone and Airtel.

**Table 3.3.57**

**Descriptive statistics of the variable - brand value**

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Mean*</th>
<th>N</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>3.93</td>
<td>264</td>
<td>.709</td>
</tr>
<tr>
<td>BSNL</td>
<td>4.17</td>
<td>255</td>
<td>.626</td>
</tr>
<tr>
<td>Vodafone</td>
<td>4.12</td>
<td>229</td>
<td>.736</td>
</tr>
<tr>
<td>Airtel</td>
<td>3.90</td>
<td>122</td>
<td>.661</td>
</tr>
<tr>
<td>Total</td>
<td>4.05</td>
<td>870</td>
<td>.695</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.3.56 indicates that the significance value of the variable ‘Brand value’ is 0.000. The value is less than 0.05. Therefore, it can be concluded that the brand value significantly differs between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.3.55 indicates that the BSNL and Vodafone have significantly higher levels in the rating of brand value than Idea and Airtel. The descriptive statistics of the variable given in the table 3.3.57 also agrees to this finding.

**Brand value of mobile telecom service providers: post hoc procedures for the Kruskal-Wallis test**

The Kruskal-Wallis test results shows that the brand value significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:
(1) Post hoc test 1: The Idea compared to the BSNL

(2) Post hoc test 2: The Vodafone compared to the BSNL

(3) Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^\text{11}\) is applied and the critical value of significance is computed as 0.0167.

1. **The Idea compared to the BSNL: Mann-Whitney U test**

   The summary of ranked data corresponding to the variable ‘Brand value’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.58.

   ![Table 3.3.58](image)

The table 3.3.59 shows the test statistic for the Mann-Whitney test on the focused comparison of the variable ‘Brand value’ pertaining to the mobile service providers Idea and BSNL.

![Table 3.3.59](image)

---

The summary of Mann – Whitney test statistics shown in table 3.3.59 indicates that the observed significance value of the variable ‘Brand value’ is less than 0.0167. Therefore brand value significantly differs between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.58 indicates that the mobile service provider BSNL has significantly higher levels in the rating of brand value than Idea.

2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variable brand value of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.60.

Table 3.3.60
Mean ranking of brand value of Vodafone and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand value</td>
<td>BSNL</td>
<td>255</td>
<td>242.99</td>
</tr>
<tr>
<td></td>
<td>Vodafone</td>
<td>229</td>
<td>241.96</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.61 shows the test statistic for the Mann-Whitney test on the focused comparison of the variable ‘Brand value’ pertaining to the mobile service providers Vodafone and BSNL.

Table 3.3.61
Mann - Whitney U test statistics based on brand value of Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Brand value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>29073.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>55408.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.081</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.935</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.3.61 indicates that the observed significance value of the variable ‘Brand value’ is greater than 0.0167. Therefore brand value does not significantly differ between BSNL and Vodafone.

3. **The Airtel compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variable ‘Brand value’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.3.62.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand value</td>
<td>BSNL</td>
<td>255</td>
<td>204.59</td>
</tr>
<tr>
<td></td>
<td>Airtel</td>
<td>122</td>
<td>156.42</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>377</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.3.63 shows the test statistic for the Mann-Whitney test on the focused comparison of the variable ‘Brand value’ pertaining to the mobile service providers Airtel and BSNL.

<table>
<thead>
<tr>
<th>Details</th>
<th>Brand value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>11580.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>19083.500</td>
</tr>
<tr>
<td>Z</td>
<td>-4.071</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.3.63 indicates that the observed significance values of the variable brand value is less
than 0.0167. Therefore brand value significantly differs between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.3.62 indicates that the brand value of BSNL is significantly higher than that of Airtel.

3.4 Analysis of pricing strategies of BSNL and private sector mobile telecom service providers in Kerala

Hypothesis 2

There is significant difference between the pricing strategies of BSNL and private sector mobile telecom service providers in Kerala.

Variables considered for the analysis of pricing strategies

The variables considered for the analysis of pricing strategies of mobile telecom service providers in Kerala are: tariff variety, competitive pricing and ethical pricing practices.

The tariff variety is measured by the items ‘Variety of tariff plans’, ‘Easiness to switch between tariff plans’, ‘Convenient recharge options for prepaid customers’, and ‘Advise suitable tariff plans’. The competitive pricing is measured by the items: ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’. The variable ethical pricing practices comprises of ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’

All items of the variables are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree.

All the variables considered for the analysis of pricing strategies of mobile telecom service providers are separately tested with following hypotheses.

3.4.1 Tariff variety offered to prepaid customers

The variable considered for the analysis is the tariff variety offered to prepaid customers of mobile telecom service providers. The items used to measure the variable are: ‘Attractive varieties of tariff plans are offered by the mobile service
provider’, ‘It is very easy to switchover from existing tariff plan to any other tariff plan’, ‘Recharge facility available for convenient options’ and ‘The mobile service provider advises suitable tariff plans to the customers’.

**Hypothesis 2.1**

The pricing strategies associated with Tariff variety offered to pre-paid customers specifically ‘Variety of tariff plans’, ‘Easiness to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise suitable tariff plans’ significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 2.1. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options, and ‘Advise suitable tariff plans’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.4.1.
Table 3.4.1
Mean ranking of tariff variety offered to prepaid customers by mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>229</td>
<td>378.53</td>
<td>371.49</td>
<td>398.27</td>
<td>435.12</td>
</tr>
<tr>
<td>BSNL</td>
<td>230</td>
<td>403.86</td>
<td>430.52</td>
<td>324.50</td>
<td>251.20</td>
</tr>
<tr>
<td>Vodafone</td>
<td>200</td>
<td>359.78</td>
<td>341.88</td>
<td>418.84</td>
<td>444.88</td>
</tr>
<tr>
<td>Airtel</td>
<td>107</td>
<td>394.72</td>
<td>385.93</td>
<td>412.66</td>
<td>442.68</td>
</tr>
<tr>
<td>Total</td>
<td>766</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.2 shows the test statistic for the Kruskal-Wallis test based on tariff variety offered to prepaid customers by the mobile service providers, the associated degrees of freedom and the significance. As the number of the mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.4.2
Kruskal-Wallis test statistics based on tariff variety offered to prepaid customers by mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>6.146</td>
<td>23.822</td>
<td>29.860</td>
<td>129.809</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.105</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.4.3 shows the descriptive statistics of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.
Table 3.4.3
Descriptive statistics of tariff variety offered to prepaid customers by mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Variety of tariff plans*</th>
<th>Easy to switch between tariff plans *</th>
<th>Convenient recharge options *</th>
<th>Advise of suitable tariff plans *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>229</td>
<td>3.95</td>
<td>.717</td>
<td>3.77</td>
<td>.684</td>
</tr>
<tr>
<td>BSNL</td>
<td>230</td>
<td>4.01</td>
<td>.796</td>
<td>3.97</td>
<td>.686</td>
</tr>
<tr>
<td>Vodafone</td>
<td>200</td>
<td>3.88</td>
<td>.761</td>
<td>3.64</td>
<td>.729</td>
</tr>
<tr>
<td>Airtel</td>
<td>107</td>
<td>3.99</td>
<td>.759</td>
<td>3.80</td>
<td>.758</td>
</tr>
<tr>
<td>Total</td>
<td>766</td>
<td>3.96</td>
<td>.759</td>
<td>3.80</td>
<td>.717</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.4.2 indicates that the significance value is 0.000 for the variables ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’. These values are less than 0.05. Therefore, it can be concluded that the pricing strategies associated with variety of tariff plans offered to prepaid customers specifically ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise suitable tariff plans’ significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value is 0.105 for the variable ‘Variety of tariff plans’. As the value is greater than 0.05, it can be concluded that the ‘Variety of tariff plans’ does not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.4.1 indicates that BSNL has significantly higher level in the value of the variable ‘Easy to switch over tariff plans’. The private sector telecom service providers have significantly higher levels in the values of the variables ‘Convenient recharge options available’, ‘and ‘Advise suitable tariff plans’ than BSNL. The descriptive statistics of the variables given in the table 3.4.3 also agrees to these findings.
Variety of tariff plans offered to prepaid customers: post hoc procedures for the Kruskal-Wallis test

The Kruskal-Wallis test results shows that the variety of tariff plans offered to pre-paid customers specifically ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise suitable tariff plans’ significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^{12}\) is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.4.

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Table 3.4.4
Mean ranking of tariff variety offered to prepaid customers by Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>229</td>
<td>222.23</td>
<td>212.00</td>
<td>252.56</td>
<td>287.41</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>230</td>
<td>237.73</td>
<td>247.92</td>
<td>207.54</td>
<td>172.84</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>459</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.5 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advises of suitable tariff plans’ pertaining to the mobile service providers Idea and BSNL.

Table 3.4.5
Mann-Whitney U test statistics based on tariff variety offered to prepaid customers by Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>24556.00</td>
<td>22213.00</td>
<td>21169.00</td>
<td>13187.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>50891.00</td>
<td>48548.00</td>
<td>47734.00</td>
<td>39752.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.455</td>
<td>-3.347</td>
<td>-4.015</td>
<td>-9.650</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.146</td>
<td>.001</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann–Whitney test statistics shown in table 3.4.5 indicates that the observed significance values of the variables ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advises of suitable tariff plans’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.4 indicates that the mobile service provider
Idea has significantly higher levels of values of the variables, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ than BSNL. The mobile service provider BSNL has significantly higher level in the value of mean ranking of the variable ‘Easy to switch between tariff plans’ than Idea.

The significance value of the variable ‘Variety of tariff plans’ is 0.146. As the value is greater than 0.0167, it can be concluded that ‘Variety of tariff plans’ does not significantly differ between BSNL and Idea.

2. The Vodafone compared to the BSNL: Mann-Whitney U test.

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.6.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Variety of tariff plans</td>
</tr>
<tr>
<td>Vodafone</td>
<td>200</td>
<td>202.54</td>
</tr>
<tr>
<td>BSNL</td>
<td>230</td>
<td>226.77</td>
</tr>
<tr>
<td>Total</td>
<td>430</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.7 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ pertaining to the mobile service providers Vodafone and BSNL.
Table 3.4.7
Mann - Whitney U test statistics based on tariff variety offered to prepaid customers by Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>20408.500</td>
<td>17703.500</td>
<td>17412.000</td>
<td>11515.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>40508.500</td>
<td>37803.500</td>
<td>43977.000</td>
<td>38080.000</td>
</tr>
<tr>
<td>Z</td>
<td>-2.284</td>
<td>-4.719</td>
<td>-4.744</td>
<td>-9.289</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.022</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.7 indicates that the observed significance values of the variables ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.6 indicates that the mobile service provider Vodafone has significantly higher levels of values of the variables, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ than BSNL. The mean ranking indicates that BSNL has significantly higher levels of values of the variable ‘Easy to switch between tariff plans’.

The significance value of the variable ‘Variety of tariff plans’, is greater than 0.0167. Hence it can be concluded that the variable ‘Variety of tariff plans’ doesn’t significantly differ between BSNL and Vodafone.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.8.
Table 3.4.8
Mean ranking of tariff variety offered to prepaid customers by Airtel and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airtel</td>
<td>107</td>
<td>166.09</td>
<td>155.94</td>
<td>195.31</td>
<td>223.17</td>
</tr>
<tr>
<td>BSNL</td>
<td>230</td>
<td>170.35</td>
<td>175.07</td>
<td>156.76</td>
<td>143.80</td>
</tr>
<tr>
<td>Total</td>
<td>337</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.9 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ pertaining to the mobile service providers Airtel and BSNL.

Table 3.4.9
Mann-Whitney U test statistics based on tariff variety offered to prepaid customers by Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Convenient recharge options available (Prepaid)</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>11993.500</td>
<td>10908.000</td>
<td>9490.000</td>
<td>6509.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>17771.500</td>
<td>16686.000</td>
<td>36055.000</td>
<td>33074.000</td>
</tr>
<tr>
<td>Z</td>
<td>-.432</td>
<td>-1.923</td>
<td>-3.716</td>
<td>-7.203</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.665</td>
<td>.054</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann–Whitney test statistics shown in table 3.4.9 indicates that the observed significance values of the variables ‘Convenient recharge options’, and ‘Advise of suitable tariff plans’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.8
indicates that the mobile service provider Airtel has significantly higher levels of values for these variables than BSNL.

The significance values of are 0.054 for the variable ‘Easy to switch between tariff plans’, and 0.665 for the variable ‘Variety of tariff plans’. As these values are greater than 0.0167, it can be concluded that the variables ‘Variety of tariff plans’, and ‘Easy to switch between tariff plans’ do not significantly differ between BSNL and Airtel.

### 3.4.2 Tariff variety offered to post-paid customers

The variable considered for the analysis is the tariff variety offered to post-paid customers of mobile telecom service providers. The items used to measure the variable are: ‘Attractive varieties of tariff plans are offered by the mobile service provider’, ‘It is very easy to switchover from existing tariff plan to any other tariff plan’, and ‘The mobile service provider advises suitable tariff plans to the customers’.

**Hypothesis 2.2**

The pricing strategies associated with Tariff variety offered to post-paid customers specifically ‘Tariff variety’, ‘Easiness to switch between tariff plans’, and ‘Advise of suitable tariff plans’ significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

### Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

### Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have
heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 2.2. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise suitable tariff plans’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.4.10.

**Table 3.4.10**
Mean ranking of tariff variety offered to post-paid customers by mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Variety of</td>
<td>Easy to switch over</td>
<td>Advises suitable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>tariff plans</td>
<td>tariff plans</td>
<td>tariff plans</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>35</td>
<td>43.54</td>
<td>47.53</td>
<td>60.13</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>55.48</td>
<td>52.22</td>
<td>28.04</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>53.57</td>
<td>56.03</td>
<td>67.93</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>66.37</td>
<td>57.73</td>
<td>45.63</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.11 shows the test statistic for the Kruskal-Wallis test based on tariff variety offered to post-paid customers by the mobile service providers, the associated degrees of freedom and the significance. As the number of the mobile service providers considered for analysis is four, the degrees of freedom will be three.

**Table 3.4.11**
Kruskal-Wallis test statistics based on tariff variety offered to post-paid customers by mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>9.060</td>
<td>2.258</td>
<td>29.636</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.029</td>
<td>.521</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The table 3.4.12 shows the descriptive statistics of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise suitable tariff plans’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel

Table 3.4.12
Descriptive statistics of tariff variety offered to post-paid customers by mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Variety of tariff plans*</th>
<th>Easy to switch between tariff plans*</th>
<th>Advise of suitable tariff plans*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>35</td>
<td>3.80</td>
<td>.584</td>
<td>3.66</td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>4.08</td>
<td>.493</td>
<td>3.76</td>
</tr>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>4.03</td>
<td>.626</td>
<td>3.90</td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>4.33</td>
<td>.617</td>
<td>3.93</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>4.01</td>
<td>.599</td>
<td>3.79</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.4.11 indicates that the significance value is 0.000 for the variable ‘Advise of suitable tariff plans’ and 0.029 for the variable ‘Variety of tariff plans’. These values are less than 0.05. Therefore, it can be concluded that the pricing strategies associated with the tariff variety offered to post-paid customers specifically ‘Variety of tariff plans’ and ‘Advise suitable tariff plans’ significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value is 0.521 for the variable ‘Easy to switch between tariff plans’. As the value is greater than 0.05, it can be concluded that the ‘Easy to switch between tariff plans’ does not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.4.10 indicates that the service provider Airtel has comparatively higher level in the value of the variable ‘Variety of tariff plans’ than other service providers. The private sector telecom service providers have significantly higher levels in the values of the
variables ‘Advises suitable tariff plans’ than BSNL. The descriptive statistics of the variables given in the table 3.4.12 also agrees to these findings.

**Variety of tariff plans offered to post-paid customers: post hoc procedures for the Kruskal-Wallis test**

The Kruskal-Wallis test results show that the variety of tariff plans offered to post-paid customers specifically ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise suitable tariff plans’ significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. **Post hoc test 1:** The Idea compared to the BSNL
2. **Post hoc test 2:** The Vodafone compared to the BSNL
3. **Post hoc test 3:** The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^\text{13}\) is applied and the critical value of significance is computed as 0.0167.

1. **The Idea compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.13.

---

Table 3.4.13

Mean ranking of tariff variety offered to post-paid customers by Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Variety of tariff plans</td>
<td>Easy to switch over tariff plans</td>
<td>Advises suitable tariff plans</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>35</td>
<td>27.49</td>
<td>29.33</td>
<td>38.27</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>34.72</td>
<td>32.14</td>
<td>19.62</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.14 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ pertaining to mobile service providers Idea and BSNL.

Table 3.4.14

Mann - Whitney U test statistics based on tariff variety offered to post-paid customers by Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>332.000</td>
<td>396.500</td>
<td>165.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>962.000</td>
<td>1026.500</td>
<td>490.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.930</td>
<td>-.707</td>
<td>-4.250</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.054</td>
<td>.480</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.14 indicates that the observed significance values of the variables ‘Advise of suitable tariff plans’ is less than 0.0167. Therefore this variable significantly differs between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.13 indicates that the mobile service provider Idea has significantly higher level in the value of the variable, ‘Advise of suitable tariff plans’ than BSNL. The significance values of the variables ‘Variety of tariff...
plans’ and ‘Easy to switch over tariff plans’ are greater than 0.0167, it can be concluded these variables do not significantly differ between BSNL and Idea.

2. **The Vodafone compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.15.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodafone</td>
<td>29</td>
<td>27.07</td>
<td>28.45</td>
<td>36.74</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>28.00</td>
<td>26.40</td>
<td>16.78</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.16 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ pertaining to the mobile service providers Vodafone and BSNL.

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>350.000</td>
<td>335.000</td>
<td>94.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>785.000</td>
<td>660.000</td>
<td>419.500</td>
</tr>
<tr>
<td>Z</td>
<td>-.265</td>
<td>-.532</td>
<td>-.834</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.791</td>
<td>.595</td>
<td>.000</td>
</tr>
</tbody>
</table>

**Table 3.4.16**

Mann - Whitney U test statistics based on tariff variety offered to post-paid customers by Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grouping Variable: Mobile Service Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The summary of Mann – Whitney test statistics shown in table 3.4.16 indicates that the observed significance values of the variable ‘Advise of suitable tariff plans’ is less than 0.0167. Therefore this variable significantly differs between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.15 indicates that the mobile service provider Vodafone has significantly higher level in the value of the variable, ‘Advise of suitable tariff plans’ than BSNL. The significance values of the variables ‘Variety of tariff plans’ and ‘Easy to switch over tariff plans’ are greater than 0.0167, it can be concluded these variables do not significantly differ between BSNL and Vodafone.

3. The Airtel Compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Variety of tariff plans’, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.17.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Variety of tariff plans</td>
</tr>
<tr>
<td>Airtel</td>
<td>15</td>
<td>23.40</td>
</tr>
<tr>
<td>BSNL</td>
<td>25</td>
<td>18.76</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.18 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Variety of tariff plans, ‘Easy to switch between tariff plans’, and ‘Advise of suitable tariff plans’ pertaining to the mobile service providers Airtel and BSNL.
The summary of Mann – Whitney test statistics shown in Table 3.4.18 indicates that the observed significance values of the variables ‘Easy to switch between tariff plans’, ‘Variety of tariff plans’, and ‘Advises suitable tariff plans’ are greater than 0.0167. So it can be concluded that these variables do not significantly differ between BSNL and Airtel.

**3.4.3 Competitive pricing offered by mobile service providers**

The variable considered for the analysis is the competitive pricing of mobile telecom service providers. The items used to measure the variable are: ‘The pricing of the mobile services are better as compared to other providers’, ‘The offers are attractive as compared to competition mobile services’ and ‘The mobile services deliver the real value for money spend on it’.

**Hypothesis 2.3**

The competitive pricing strategies specifically ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for Money Spends’ significantly differ between BSNL and private sector mobile telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Better pricing as compared to others’, ‘Better

---

**Table 3.4.18**

Mann - Whitney U test statistics based on tariff variety offered to post-paid customers by Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans</th>
<th>Easy to switch over tariff plans</th>
<th>Advises suitable tariff plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>144.000</td>
<td>167.000</td>
<td>116.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>469.000</td>
<td>492.000</td>
<td>441.000</td>
</tr>
<tr>
<td>Z</td>
<td>-1.477</td>
<td>- .654</td>
<td>- 2.114</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.140</td>
<td>.513</td>
<td>.035</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The groups have homogeneous variances of the variables ‘Better offers as compared to others’ and ‘Value for money spends’ and heterogeneous variances of the variable ‘Better pricing as compared to others’. Therefore the Kruskal-Wallis test is used to test the Hypothesis 2.3. The Mann-Whitney U test is used for the non-parametric post hoc procedures.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for Money Spend’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.4.19.

**Table 3.4.19**

Mean ranking of competitive pricing offered by mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Better pricing as compared to others</td>
<td>Better offers as compared to others</td>
<td>Value for money spends</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>371.09</td>
<td>440.98</td>
<td>367.44</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>537.65</td>
<td>403.10</td>
<td>541.15</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>412.43</td>
<td>444.03</td>
<td>406.48</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>404.68</td>
<td>475.36</td>
<td>416.44</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.20 shows the test statistic for the Kruskal-Wallis test based on competitive pricing offered by the mobile service providers, the associated degrees
of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.4.20
Kruskal-Wallis test statistics based on competitive pricing offered by mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Better pricing as compared to others</th>
<th>Better offers as compared to others</th>
<th>Value for money spends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>71.794</td>
<td>8.940</td>
<td>84.292</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.030</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The table 3.4.21 shows the descriptive statistics of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.

Table 3.4.21
Descriptive statistics of competitive pricing offered by mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Better pricing as compared to others*</th>
<th>Better offers as compared to others*</th>
<th>Value for money Spends*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>3.31</td>
<td>.864</td>
<td>3.53</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>3.92</td>
<td>.961</td>
<td>3.35</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>3.45</td>
<td>.905</td>
<td>3.54</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>3.43</td>
<td>.944</td>
<td>3.67</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>3.54</td>
<td>.947</td>
<td>3.50</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.4.20 indicates that the significance value is less than 0.05 for the variables ‘Better pricing as
compared to others’, ‘Value for money spends’ and ‘Better offers as compared to others’. Therefore, it can be concluded that these variables significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.4.19 indicates that BSNL has significantly higher levels in the values of the variables ‘Better pricing as compared to others’, and ‘Value for money spends’. The private sector telecom service providers have significantly higher levels in the values of the variable ‘Better offers as compared to others’. The descriptive statistics of the variables given in the table 3.4.21 also agrees to these findings.

**Competitive pricing offered by mobile service providers: post hoc procedures for the Kruskal-Wallis test**

The Kruskal-Wallis test results shows that the competitive pricing strategies specifically ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for Money Spends’ significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lie. Hence Mann-Whitney U test has done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^{14}\) is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.22.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Better pricing as compared to others</td>
<td>Better offers as compared to others</td>
<td>Value for money spends</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>211.54</td>
<td>271.31</td>
<td>208.97</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>310.17</td>
<td>248.29</td>
<td>312.83</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.23 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Idea and BSNL.

<table>
<thead>
<tr>
<th>Details</th>
<th>Better pricing as compared to others</th>
<th>Better offers as compared to others</th>
<th>Value for money spends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>20866.500</td>
<td>30673.000</td>
<td>20189.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>55846.500</td>
<td>63313.000</td>
<td>55169.000</td>
</tr>
<tr>
<td>Z</td>
<td>-7.965</td>
<td>-1.852</td>
<td>-8.790</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.064</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.4.23 indicates that the observed significance values of the variables ‘Better pricing as compared to others’, and ‘Value for money spends’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.22 indicates that the mobile service provider BSNL has significantly higher levels of values of the variables, ‘Better pricing as compared to others’, and ‘Value for money spends’ than Idea. The significance value of the variable ‘Better offers as compared to others’ and it is greater than 0.0167. Therefore it can be concluded that ‘Better offers as compared to others’ doesn’t significantly differ between BSNL and Idea.

2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for Money Spend’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.24.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Better pricing as compared to others</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>205.21</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>275.98</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.25 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Vodafone and BSNL.
Table 3.4.25
Mann - Whitney U test statistics based on competitive pricing offered by Vodafone and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Better pricing as compared to others</th>
<th>Better offers as compared to others</th>
<th>Value for money spends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>20659.000</td>
<td>26425.500</td>
<td>20094.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>46994.000</td>
<td>59065.500</td>
<td>46429.000</td>
</tr>
<tr>
<td>Z</td>
<td>-5.969</td>
<td>-1.929</td>
<td>-6.646</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.054</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.25 indicates that the observed significance values of the variables ‘Better pricing as compared to others’, and ‘Value for Money Spends’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.24 indicates that the mobile service provider BSNL has significantly higher levels of values of the variables, ‘Better pricing as compared to others’, and ‘Value for money spends’ than Vodafone. The significance value of the variable ‘Better offers as compared to others’ and it is greater than 0.0167. Therefore it can be concluded that ‘Better offers as compared to others’ doesn’t significantly differ between BSNL and Vodafone.

3. The Airtel compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.26.
Table 3.4.26
Mean ranking of competitive pricing offered by Airtel and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Better pricing as compared to others</td>
<td>Better offers as compared to others</td>
<td>Value for money spends</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>150.34</td>
<td>209.52</td>
<td>153.22</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>207.50</td>
<td>179.18</td>
<td>206.12</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.27 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ pertaining to the mobile service providers Airtel and BSNL.

Table 3.4.27
Mann - Whitney U test statistics based on competitive pricing offered by Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Better pricing as compared to others</th>
<th>Better offers as compared to others</th>
<th>Value for money spends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>10838.500</td>
<td>13052.000</td>
<td>11190.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>18341.500</td>
<td>45692.000</td>
<td>18693.000</td>
</tr>
<tr>
<td>Z</td>
<td>-5.087</td>
<td>-2.649</td>
<td>-4.883</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.008</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.27 indicates that the observed significance values of the variables ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.26 indicates that the mobile service provider BSNL has significantly higher levels of values of the variables ‘Better pricing as compared to others’ and ‘Value for money spends’ than Airtel. The mean ranking
shows that Airtel has significantly higher level in the value of the variable ‘Better offers as compared to others’ than BSNL.

3.4.4 Ethical pricing practices of mobile service providers

The variable considered for the analysis is the ethical pricing practices of mobile telecom service providers. The items used to measure the variable are: ‘The charging for services are transparent and there are no hidden charges’, ‘The service provider didn’t play unethical pricing practices’, and ‘Deactivation of additional services, if required, can be done very easily in the mobile connection’.

Hypothesis 2.4

The ethical pricing practices specifically ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ significantly differ between BSNL and private sector telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the groups have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 2.4. The Mann-Whitney U test is used for the non-parametric post hoc procedures.
Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.4.28.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Transparent billing and no hidden charges</td>
<td>Ethical pricing practices</td>
<td>Easiness to deactivate additional services - if required</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>325.12</td>
<td>289.84</td>
<td>385.55</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>593.37</td>
<td>618.37</td>
<td>451.31</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>408.00</td>
<td>400.62</td>
<td>460.62</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>396.02</td>
<td>433.94</td>
<td>463.38</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.29 shows the test statistic for the Kruskal-Wallis test based on ethical pricing practices of the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

<table>
<thead>
<tr>
<th>Details</th>
<th>Transparent billing and no hidden charges</th>
<th>Ethical pricing practices</th>
<th>Easiness to deactivate additional services - if required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>180.388</td>
<td>249.901</td>
<td>17.828</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The table 3.4.30 shows the descriptive statistics of the variables ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Idea, BSNL, Vodafone and Airtel.

Table 3.4.30

Descriptive statistics of ethical pricing practices of mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Transparent billing and no hidden charges *</th>
<th>Ethical pricing practices *</th>
<th>Easiness to deactivate additional services – if required*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>3.13</td>
<td>.982</td>
<td>2.82</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>4.20</td>
<td>.769</td>
<td>4.18</td>
</tr>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>3.49</td>
<td>.814</td>
<td>3.30</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
<td>3.42</td>
<td>.978</td>
<td>3.44</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>3.58</td>
<td>.975</td>
<td>3.43</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.4.29 indicates that the significance value is less than 0.05 for the variables ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’. Therefore, it can be concluded that the ethical pricing practices specifically ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ significantly differ between BSNL and private sector telecom service providers in Kerala. The value of mean ranking based on Kruskal-Wallis test given in table 3.4.28 indicates that BSNL has significantly higher level in the values of the variables ‘Transparent billing and no hidden charges, and ‘Ethical pricing practices’. The mean ranking of the variable ‘Easiness to deactivate additional services - if required’ shows comparatively low value for Idea than other telecom service providers. The descriptive statistics of the variables given in the table 3.4.30 also agrees to these findings.
Ethical pricing practices of mobile service providers: post hoc procedures for the Kruskal-Wallis test

The Kruskal-Wallis test results show that the ethical pricing practices specifically ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ significantly differ between BSNL and private sector telecom service providers in Kerala. But it doesn’t show where the difference lies. Hence Mann-Whitney U test has been done for post hoc procedures for the Kruskal-Wallis test. As the study is focused on the comparative study of marketing strategies of private sector telecom service providers and BSNL, a concise set of comparison would be, to compare each private sector mobile service provider against BSNL. The post hoc procedures for the comparative study are:

1. Post hoc test 1: The Idea compared to the BSNL
2. Post hoc test 2: The Vodafone compared to the BSNL
3. Post hoc test 3: The Airtel compared to the BSNL

As three Mann-Whitney U tests are suggested for the post hoc analysis, in order to reduce the Type I error, Bonferroni correction\(^{15}\) is applied and the critical value of significance is computed as 0.0167.

1. The Idea compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ of the mobile service providers Idea and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.31.

Table 3.4.31
Mean ranking of ethical pricing practices of Idea and BSNL based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transparent billing and no hidden charges</td>
<td>Ethical pricing practices</td>
<td>Easiness to deactivate additional services - if required</td>
</tr>
<tr>
<td>Idea</td>
<td>264</td>
<td>184.56</td>
<td>168.25</td>
<td>239.73</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>338.11</td>
<td>354.99</td>
<td>280.98</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.32 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Idea and BSNL.

Table 3.4.32
Mann - Whitney U test statistics based on ethical pricing practices of Idea and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Transparent billing and no hidden charges</th>
<th>Ethical pricing practices</th>
<th>Easiness to deactivate additional services - if required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>13743.000</td>
<td>9437.500</td>
<td>28310.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>48723.000</td>
<td>44417.500</td>
<td>63290.000</td>
</tr>
<tr>
<td>Z</td>
<td>-12.316</td>
<td>-14.724</td>
<td>-3.368</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.001</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.32 indicates that the observed significance values of the variables ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Idea and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.31 indicates that the mobile service provider BSNL has significantly higher levels of values for these variables than Idea.
2. The Vodafone compared to the BSNL: Mann-Whitney U test

The summary of ranked data corresponding to the variables ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ of the mobile service providers Vodafone and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.33.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Transparent billing and no hidden charges</th>
<th>Ethical pricing practices</th>
<th>Easiness to deactivate additional services - if required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodafone</td>
<td>229</td>
<td>184.50</td>
<td>175.04</td>
<td>245.87</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
<td>294.58</td>
<td>303.08</td>
<td>239.47</td>
</tr>
<tr>
<td>Total</td>
<td>484</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.4.34 shows the test statistic for the Mann-Whitney test on the focused comparison of the variables ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Vodafone and BSNL.

<table>
<thead>
<tr>
<th>Details</th>
<th>Transparent billing and no hidden charges</th>
<th>Ethical pricing practices</th>
<th>Easiness to deactivate additional services - if required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>15916.000</td>
<td>13750.000</td>
<td>28426.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>42251.000</td>
<td>40085.000</td>
<td>61066.000</td>
</tr>
<tr>
<td>Z</td>
<td>-.9.505</td>
<td>-10.708</td>
<td>-.554</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.579</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The summary of Mann – Whitney test statistics shown in table 3.4.34 indicates that the observed significance values of the variables ‘Transparent billing and no hidden charges’ and ‘Ethical pricing practices’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Vodafone and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.33 indicates that the mobile service provider BSNL has significantly higher levels of values for these variables than Vodafone. The significance values of the variable ‘Easiness to deactivate additional services - if required’ is greater than 0.0167. Therefore it can be concluded that ‘Easiness to deactivate additional services - if required’ doesn’t significantly differ between BSNL and Vodafone.

3. **The Airtel compared to the BSNL: Mann-Whitney U test**

The summary of ranked data corresponding to the variables Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ of the mobile service providers Airtel and BSNL has been computed with Mann-Whitney U test. The test results are given in the table 3.4.35.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Mean ranking of ethical pricing practices of Airtel and BSNL based on Mann-Whitney U test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mobile Service Provider</td>
</tr>
<tr>
<td>Airtel</td>
<td>122</td>
</tr>
<tr>
<td>BSNL</td>
<td>255</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
</tr>
</tbody>
</table>

The table 3.4.36 shows the test statistic for the Mann- Whitney test on the focused comparison of the variables ‘Transparent billing and no hidden charges, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’ pertaining to the mobile service providers Airtel and BSNL.
Table 3.4.36
Mann - Whitney U test statistics based on ethical pricing practices of Airtel and BSNL

<table>
<thead>
<tr>
<th>Details</th>
<th>Transparent billing and no hidden charges</th>
<th>Ethical pricing practices</th>
<th>Easiness to deactivate additional services - if required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>8497.500</td>
<td>8592.500</td>
<td>15008.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>16000.500</td>
<td>16095.500</td>
<td>47648.500</td>
</tr>
<tr>
<td>Z</td>
<td>-7.716</td>
<td>-7.503</td>
<td>-.599</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.549</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider

The summary of Mann – Whitney test statistics shown in table 3.4.36 indicates that the observed significance values of the variables ‘Transparent billing and no hidden charges’ and ‘Ethical pricing practices’ are less than 0.0167. Therefore these variables significantly differ between the mobile service providers Airtel and BSNL. The value of mean ranking based on Mann-Whitney test given in table 3.4.35 indicates that the mobile service provider BSNL has significantly higher levels of values for these variables than Airtel. The significance values of the variable ‘Easiness to deactivate additional services - if required’ is greater than 0.0167. Therefore it can be concluded that ‘Easiness to deactivate additional services - if required’ doesn’t significantly differ between BSNL and Airtel.

3.5 Analysis of promotion strategies of BSNL and private sector mobile telecom service providers in Kerala.

Hypothesis 3

There is significant difference between the promotion strategies of BSNL and private sector mobile telecom service providers in Kerala.
Variables considered for the analysis of promotion strategies

The variables considered for the analysis of promotion strategies of mobile telecom service providers in Kerala are: effectiveness of advertisements, attractiveness of website of mobile telecom service providers, attractiveness of price reduction offers, attractiveness of free trial offers, attractiveness of free add-on SIM card offer, attractiveness of extra talk time offer, attractiveness of SMS package offer, attractiveness of internet package offer, attractiveness of call at zero balance offer for prepaid customers, attractiveness of getting the service at bill not paid status (post-paid customers) of mobile telecom service providers, attractiveness of displays and demonstrations at point of sales, attractiveness of customized offers, and the opinion of respondents about promotional phone calls of mobile telecom service providers.

The effectiveness of advertisements of the mobile service providers are measured based on the model for predictive measurements of advertising effectiveness proposed by Robert J. Lavidge and Grey A. Steiner (1961) as cited by Philip Kotler (2009)\textsuperscript{16} to explain the hierarchy of effects of advertisements. Referring to this model the suggested advertisements tasks are: (i) to build awareness about the products and knowledge as regards to the brand (ii) to create liking, preference and faith for the service provider (iii) to act as reminder to stimulate repeat association with the service provider and (iv) to convince customer that the decision to continue with the service provider is a right choice. Rooted in

this model following items are formulated to measure the effectiveness of
 advertisements of mobile telecom service providers.

1. The messages conveyed through the advertisements are highly informative.

2. The advertisements create liking, preference and faith for the service
   provider.

3. The advertisements act as reminder to stimulate repeat association with the
   service provider.

4. The advertisements convince me that my decision to continue with the
   service provider is a right choice.

All items are measured by Likert Scale with five anchor points, specifically
Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage
is given for all items to compute the mean score of effectiveness of advertisements.

Hypothesis 3.1

The effectiveness of advertisements significantly differs between BSNL and
private sector mobile telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the
normality of distribution of variable ‘Effectiveness of advertisements’ pertaining to
the mobile service providers Idea, BSNL, Vodafone and Airtel. The test results
showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the
variable ‘Effectiveness of advertisements’ pertaining to the mobile service providers
Idea, BSNL, Vodafone and Airtel. The test results showed that the variances of the
groups have homogeneous variances. Even though the groups have homogeneous
variances, the data are not normally distributed. Therefore the Kruskal-Wallis test is
used to test the Hypothesis 3.1.
Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variable ‘Effectiveness of advertisements’ of the mobile service providers Idea, BSNL, Vodafone and Airtel has been computed with Kruskal-Wallis test. The test results are given in the table 3.5.1.

Table 3.5.1
Mean ranking of effectiveness of advertisements of mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness of</td>
<td>Idea</td>
<td>264</td>
<td>524.91</td>
</tr>
<tr>
<td>advertisements</td>
<td>BSNL</td>
<td>255</td>
<td>214.66</td>
</tr>
<tr>
<td></td>
<td>Vodafone</td>
<td>229</td>
<td>567.58</td>
</tr>
<tr>
<td></td>
<td>Airtel</td>
<td>122</td>
<td>455.70</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>870</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.5.2 shows the test statistic for the Kruskal-Wallis test based on the effectiveness of advertisements of the mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is four, the degrees of freedom will be three.

Table 3.5.2
Kruskal-Wallis test statistics based on effectiveness of advertisements of mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Effectiveness of Advertisements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>296.558</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping Variable: Mobile Service Provider
The table 3.5.3 shows the descriptive statistics of the variable effectiveness of advertisements related to the mobile service providers Idea, BSNL, Vodafone and Airtel.

Table 3.5.3
Descriptive statistics of the variable - effectiveness of advertisements

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Mean*</th>
<th>N</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>3.87</td>
<td>264</td>
<td>.768</td>
</tr>
<tr>
<td>BSNL</td>
<td>2.72</td>
<td>255</td>
<td>.743</td>
</tr>
<tr>
<td>Vodafone</td>
<td>4.03</td>
<td>229</td>
<td>.805</td>
</tr>
<tr>
<td>Airtel</td>
<td>3.65</td>
<td>122</td>
<td>.706</td>
</tr>
<tr>
<td>Total</td>
<td>3.54</td>
<td>870</td>
<td>.935</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.5.2 indicates that the significance value of the variable ‘Effectiveness of advertisements’ is less than 0.05. Therefore, it can be concluded that the effectiveness of advertisements significantly differs between BSNL and private sector telecom service providers in Kerala. The value of mean ranking based on Kruskal-Wallis test given in table 3.5.1 indicates that the most effective advertisements are from private sector telecom service providers. The rating in the effectiveness of advertisements is the highest for the Vodafone and it is followed by the service providers Idea and Airtel. The rating is the lowest for the BSNL. The descriptive statistics of the variable given in the table 3.5.3 also agrees to this finding.

3.5.2 Attractiveness of website of mobile telecom service providers

The website of service providers are one of the key elements in integrated marketing communication. But the majority of the respondents do not depend on websites of their mobile operators to get the information. The attractiveness of website is measured by a dichotomous question to verify whether the customer has visited the website, followed by five point Likert scale to test the attractiveness of the offer. The attractiveness of websites of the mobile service providers are
compared with two variables: ‘Website is a dependable source of information’ and ‘Website is user friendly’. The percentage of respondents visited the websites of service providers and the frequency descriptive analysis of attractiveness of the websites is shown in table 3.5.4.

Table 3.5.4
The attractiveness of websites of the mobile service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Visited the Website of the Service Provider</th>
<th>Total</th>
<th>Web site is a dependable source of information*</th>
<th>Website is user friendly*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (Mean)</td>
<td>No (Mean)</td>
<td>Yes (Mean)</td>
<td>No (Mean)</td>
</tr>
<tr>
<td>Idea</td>
<td>74 (3.80)</td>
<td>190 (3.59)</td>
<td>264 (4.00)</td>
<td>1.776</td>
</tr>
<tr>
<td>BSNL</td>
<td>84 (4.00)</td>
<td>171 (3.82)</td>
<td>255 (4.00)</td>
<td>8.361</td>
</tr>
<tr>
<td>Vodafone</td>
<td>60 (3.95)</td>
<td>169 (3.73)</td>
<td>229 (4.07)</td>
<td>6.490</td>
</tr>
<tr>
<td>Airtel</td>
<td>44 (4.07)</td>
<td>78 (4.09)</td>
<td>122 (4.09)</td>
<td>.587</td>
</tr>
<tr>
<td>Total</td>
<td>262 (3.94)</td>
<td>608 (3.78)</td>
<td>870 (3.78)</td>
<td>.743</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The respondents visited the websites of the service providers are on an average 30.1%. The values in the table show that the variations in this percentage are minimal between the telecom service providers. The mean value and standard deviation of the variables ‘Web site is a dependable source of information’ and ‘Website is user friendly’ show that the websites of all the service providers are fairly attractive. The service provider Airtel has comparatively more attractive website than other service providers.
3.5.3 Attractiveness of price reduction offers of mobile telecom service providers

Occasionally mobile telecom service providers offer rebates or price reduction to their customers. The attractiveness of price reduction offers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of attractiveness of price reduction offers of mobile telecom service providers are given in table 3.5.5.

Table 3.5.5
Attractiveness of price reduction offers of mobile telecom service providers: frequency descriptive analysis

| Mobile Service Provider | Rebate / Price reduction offer received | Total | Rebate / Price reduction offers are attractive *
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (Mean)</td>
<td>No (Std. Dev.)</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>134 (50.8%)</td>
<td>130 (49.2%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>90 (35.3%)</td>
<td>165 (64.7%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>125 (54.6%)</td>
<td>104 (45.4%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>57 (46.7%)</td>
<td>65 (53.3%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>406 (46.7%)</td>
<td>464 (53.3%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The respondents received price reduction offers from the service providers are on an average 46.7%. It can be seen that private telecom service providers especially Vodafone and Idea are keen in offering and communicating price reductions to customers than BSNL. The price reduction offer is generally attractive among the customers. The most attractive offers are from Airtel followed by BSNL.
Although the price reduction offers of BSNL are attractive, it is not properly communicated to the customers.

3.5.4 Attractiveness of free trial offers of mobile telecom service providers

The free trial offer is a marketing strategy to get existing customers familiarized about the newly introduced services. The free trial for a specific period is an opportunity for the service providers to project the benefits of the services to the customers. If the free trial is successful, the customers became regular subscribers of the services they experienced. The attractiveness of free trial offers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of attractiveness of free trial offers of mobile telecom service providers are given in table 3.5.6.

Table 3.5.6
Attractiveness of free trial offers of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Free trial offer received</th>
<th>Total</th>
<th>Free trial offers are attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>Idea</td>
<td>69</td>
<td>195</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>(26.1%)</td>
<td></td>
<td>(73.9%)</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>33</td>
<td>222</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>(12.9%)</td>
<td></td>
<td>(87.1%)</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>64</td>
<td>165</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>(27.9%)</td>
<td></td>
<td>(72.1%)</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>31</td>
<td>91</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>(25.4%)</td>
<td></td>
<td>(74.6%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>197</td>
<td>673</td>
<td>870 (100%)</td>
</tr>
<tr>
<td>(22.6%)</td>
<td></td>
<td>(77.4%)</td>
<td></td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

It can be observed that among private sector telecom service providers more than 25% of respondents received free trial offers from their service providers. For
BSNL it is only 12.9%. The free trial offers of all the service providers are fairly attractive. The mean scores show that the most attractive free trial offers are from Airtel and BSNL. From the data it can be inferred that the free trial offers of BSNL are not reaching majority of their customers.

3.5.5 Attractiveness of free add-on SIM card offer of mobile telecom service providers

In the market development stage the telecom service providers experimented free add-on SIM (Subscriber Identity Module) card offer to the customers. This is as equivalent as a new connection, helped operators to widen their reach through existing customers. The attractiveness of free add-on SIM card offers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis shown in table 3.5.7 indicates that BSNL was successful in implementing free add-on SIM card offer.

Table 3.5.7
Attractiveness of free add-on SIM card offer of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Free add on SIM offer received</th>
<th>Total</th>
<th>Free add-on SIM offer is attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>23</td>
<td>241</td>
<td>264</td>
</tr>
<tr>
<td></td>
<td>(8.7%)</td>
<td>(91.3%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>61</td>
<td>194</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>(23.9%)</td>
<td>(76.1%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>21</td>
<td>208</td>
<td>229</td>
</tr>
<tr>
<td></td>
<td>(9.2%)</td>
<td>(90.8%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>14</td>
<td>108</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>(11.5%)</td>
<td>(88.5%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>751</td>
<td>870</td>
</tr>
<tr>
<td></td>
<td>(13.7%)</td>
<td>(86.3%)</td>
<td>(100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.
3.5.6 Attractiveness of extra talk time offer of mobile telecom service providers

The extra talk time offer is usually practiced by the service providers in festive seasons. The additional talk time the customers received free of cost especially in festive seasons stimulated them to talk more. The ‘talk more’ nature may continue even after the withdrawal of the offer. Ultimately this scheme will be beneficial for the telecom companies in long run. The attractiveness of extra talk time offer is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The BSNL and all the private telecom service providers equally successful in promoting the extra talk time offer. The offer is fairly attractive for all the service providers. In the opinion of respondents the most attractive extra talk time offers are from Airtel and BSNL. The frequency descriptive analysis of extra talk time offer of mobile service providers are shown in table 3.5.8.

Table 3.5.8
Attractiveness of extra talk time offer of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Extra talk time offer received</th>
<th>Total</th>
<th>Extra talk time offer is attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>170 (64.4%)</td>
<td>94 (35.6%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>161 (63.1%)</td>
<td>94 (36.9%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>145 (63.3%)</td>
<td>84 (36.7%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>81 (66.4%)</td>
<td>41 (33.6%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>557 (64.0%)</td>
<td>313 (36.0%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.
3.5.7 Attractiveness of SMS package offer of mobile telecom service providers

The SMS package offers are mainly targeted for youngsters especially students. The SMS communication is more popular among this segment due to its peculiar characteristics and relatively low pricing as compared to phone calls. The attractiveness of SMS package offers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of SMS package offer is shown in table 3.5.9.

Table 3.5.9
Attractiveness of SMS package offer of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>SMS package offer received</th>
<th>Total</th>
<th>SMS package offer is attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>74</td>
<td>190</td>
<td>3.70</td>
</tr>
<tr>
<td>BSNL</td>
<td>46</td>
<td>209</td>
<td>4.09</td>
</tr>
<tr>
<td>Vodafone</td>
<td>77</td>
<td>152</td>
<td>3.73</td>
</tr>
<tr>
<td>Airtel</td>
<td>50</td>
<td>72</td>
<td>4.04</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>623</td>
<td>3.85</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The SMS package offers of all the service providers are fairly attractive. The offers of Airtel and BSNL are more attractive than other service providers. Although the offers of BSNL are comparatively more attractive, it doesn’t reach the customers.
3.5.8 Attractiveness of internet package offer of mobile telecom service providers

The internet savvy customers always search for attractive internet packages. The youths and the practitioners of m-commerce are belonging to this segment. In order to attract this segment the service providers are offering various internet packages. The attractiveness of internet package offers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of internet package offer is shown in table 3.5.10

Table 3.5.10
Attractiveness of internet package offer of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Internet package offer received</th>
<th>Total</th>
<th>Internet package offer is attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>Idea</td>
<td>109 (41.3%)</td>
<td>155 (58.7%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>61 (23.9%)</td>
<td>194 (76.1%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>93 (40.6%)</td>
<td>136 (59.4%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>69 (56.6%)</td>
<td>53 (43.4%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>332 (38.2%)</td>
<td>538 (61.8%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The internet package offers of all the service providers are moderately attractive. The most attractive offers are from Airtel. The Airtel is forefront in designing and communicating attractive internet packages for the customers than its rivals. Although the internet packages of BSNL are attractive, BSNL has an inadequacy in communicating the same to the customers.
3.5.9 Attractiveness of call at zero balance offer for prepaid customers of mobile telecom service providers

The call at zero balance offer allows customers to make calls even at zero balance for a limited amount. In BSNL the customers can make calls up to Rs 10/- at zero balance and the facility is offered free of cost. Even though Idea and Vodafone also have this offer, the customers have to pay facility activation charges. The activation charges are varying from time to time. The amount in debit of the customer will be adjusted in the subsequent recharge. The Airtel doesn’t have such an offer. The attractiveness of call at zero balance offer for prepaid customers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of call at zero balance offer is given in table 3.5.11.

Table 3.5.11
Attractiveness of call at zero balance offer of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Call at zero balance offer (For prepaid customers)</th>
<th>Total</th>
<th>Call at zero balance offers is attractive (For prepaid customers)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>Idea</td>
<td>106</td>
<td>123</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>177</td>
<td>53</td>
<td>230 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>114</td>
<td>86</td>
<td>200 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>0</td>
<td>107</td>
<td>107 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>397</td>
<td>369</td>
<td>766 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.
It can be observed that the offer is quite popular among BSNL customers and it is highly attractive. The offer is moderately attractive for Vodafone respondents and comparatively less attractive for Idea respondents.

3.5.10 Attractiveness of getting the service at bill not paid status of post-paid customers of mobile telecom service providers

The post-paid customers are considered as the premium segment as they are high paying group and very less in numbers (approximately 3% of mobile customer base)\(^\text{17}\) as compared to prepaid customers. As part of special care to this premium segment the private telecom service provider Idea extends continued service to almost all of their post-paid customers even at non-payment of bills due to delay or oversight. The service provider Airtel and Vodafone extend this facility only to their selected post-paid customers. The public sector provider BSNL doesn’t practice this strategy. The attractiveness of getting the service at bill not paid status of post-paid customers of mobile telecom service providers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of the offer of getting the service at bill not paid status (post-paid customers) of mobile telecom service providers is shown in table 3.5.12.

\(^{17}\) The report on Indian Telecom Services Performance Indicators, March 2013. Telecom Regulatory Authority of India, p. 37.
Table 3.5.12
Attractiveness of getting the service at bill not paid status (post-paid customers) of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Getting the service at bill not paid status (post-paid customers)</th>
<th>Total</th>
<th>Getting the service at bill not paid status is attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>32 (91.4%)</td>
<td>3 (8.6%)</td>
<td>35 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>0 (0%)</td>
<td>25 (100%)</td>
<td>25 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>7 (24.1%)</td>
<td>22 (75.9%)</td>
<td>29 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>7 (46.7%)</td>
<td>8 (53.3%)</td>
<td>15 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>46 (44.2%)</td>
<td>58 (55.8%)</td>
<td>104 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The customers found this facility highly attractive. The rating of attractiveness of this facility is the highest for the telecom service provider Idea and it is followed by the Airtel.

3.5.11 Attractiveness of displays and demonstrations at point of sales of mobile telecom service providers

The displays and demonstrations at point of sales are the invitation to the customers to avail the services. The newly introduced value added services and third generation mobile telecom services definitely require demonstrations before the prospects. It serves the purpose of customer training and popularity about the services being offered by the service provider. The attractiveness of displays and demonstrations at point of sales of mobile telecom service providers is measured by a dichotomous question to verify whether the customer has listened to them, followed by five point Likert scale to test the attractiveness of the displays and demonstrations.
The frequency descriptive analysis of attractiveness of displays and demonstrations at point of sales of mobile telecom service providers is shown in table 3.5.13.

### Table 3.5.13

**Attractiveness of displays and demonstrations at point of sales of mobile telecom service providers: frequency descriptive analysis**

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Attracted to displays and demonstrations at point of sales</th>
<th>Total</th>
<th>Displays and demonstrations at point of sales are attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Total</td>
</tr>
<tr>
<td>Idea</td>
<td>53  (20.1%)</td>
<td>211 (79.9%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>25  (9.8%)</td>
<td>230 (90.2%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>63  (27.5%)</td>
<td>166 (72.5%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>25  (20.5%)</td>
<td>97  (79.5%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>166 (19.1%)</td>
<td>704 (80.9%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The private sector service providers are forefront in promoting the services through POS (Point of Sales) displays and demonstrations than BSNL. Although the POS displays and demonstrations of all the above service providers are attractive, the most attractive among them are from Airtel.

### 3.5.12 Attractiveness of customized offers of mobile telecom service providers

The customization of offers at individual customer level is relatively a new trend in mobile telecom services marketing. The private telecom service providers are extremely successful in this promotional strategy. The attractiveness of customized offers of mobile telecom service providers is measured by a dichotomous question to verify whether the customer has received the offer, followed by five point Likert scale to test the attractiveness of the offer. The frequency descriptive analysis of customized offers of service providers are shown in table 3.5.14.
Table 3.5.14
Attractiveness of customized offers of mobile telecom service providers:
frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Customized offers received</th>
<th>Total</th>
<th>Customized offers are attractive*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>190 (72.0%)</td>
<td>74 (28.0%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>0 (0%)</td>
<td>255 (100%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>171 (74.7%)</td>
<td>58 (25.3%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>81 (66.4%)</td>
<td>41 (33.6%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>442 (50.8%)</td>
<td>428 (49.2%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The private service providers are so aggressive in promoting their services through customization. It can be seen that 74.7% of Vodafone respondents, 72% of Idea respondents and 66.4% of Airtel respondents are received customized offers from their service providers. Irrespective of the service providers, the respondents who received customized offers opined that customized offers are highly attractive. The most attractive offers are from the service provider Airtel. The BSNL doesn’t practice such a promotional strategy.

3.5.13 Opinion of respondents about the promotional phone calls of mobile telecom service providers

The telecom service providers often call the customers and detailed about various promotional offers, value added services, its’ advantages and benefits. Most often the recipients are not in a mood to respond to these marketing calls. Even though the customers can deactivate the unsolicited calls and messages, majority of the customers do not practice it. The opinion of respondents about the promotional phone calls of mobile telecom service providers is assessed by a dichotomous
question to verify whether the customer has received such calls, followed by five point Likert scale to test the convenience of customers to receive such calls. The frequency descriptive analysis of opinion of respondents about promotional phone calls is given in the table 3.5.15.

Table 3.5.15
Opinion of respondents about promotional phone calls of mobile telecom service providers: frequency descriptive analysis

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Promotional calls received</th>
<th>Total</th>
<th>Promotional calls are inconvenient*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Idea</td>
<td>212 (80.3%)</td>
<td>52 (19.7%)</td>
<td>264 (100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>20 (7.8%)</td>
<td>235 (92.2%)</td>
<td>255 (100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>161 (70.3%)</td>
<td>68 (29.7%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>92 (75.4%)</td>
<td>30 (24.6%)</td>
<td>122 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>485 (55.7%)</td>
<td>385 (44.3%)</td>
<td>870 (100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Agree =1, Agree = 2, Uncertain = 3, Disagree = 4, Strongly Disagree = 5; Mean Value of the Scale = 3.

The private service providers are so aggressive in promoting the services through phone calls. It can be seen that Idea is highly aggressive in this promotional activity. The BSNL is reluctant to make promotional calls to the customer. While 80.3% of Idea respondents received promotional calls, the corresponding BSNL proportion is only 7.8%. The mean score values shows that the customers do not like this promotional activity of telecom service providers in general.
3.6 The effect of service related factors on customer satisfaction and customer loyalty of customers of mobile telecommunication services

The major service related factors which directly affect customer satisfaction of customers of mobile telecom services are service benefits, customer support services, quality of service, competitive pricing, tariff variety and unethical practices of the mobile telecom service providers.

The service benefits are the basic core service benefits measured by the items voice clarity, geographical network coverage, and easiness to get connected to the network. The customer support services comprises of easiness to get new mobile connection, availability of recharge facility at convenient locations and retailer support for the prepaid customers, convenience of payment of post-paid bills and special care for the post-paid customers, easiness to activate additional services, easiness to deactivate additional services - if required, easiness to access customer care helpline, easiness to get the right customer care person on the phone and ability to solve problems at customer care touch points.

The service quality of mobile phone services are measured by the 22-item SERVQUAL scale developed by Parasuraman A. et al. (1991)\(^{18}\). The competitive pricing is measured by using the items ‘Better pricing as compared to others’, ‘Better offers as compared to others’ and ‘Value for money spends’. The tariff variety is measured by the items ‘Variety of tariff plans’, ‘Easiness to switch between tariff plans’, ‘Convenient recharge options (for prepaid customers)’, and ‘Advise suitable tariff plans’. The ethical pricing practices are assessed by the items ‘Transparent billing and no hidden charges’, ‘Ethical pricing practices’, and ‘Easiness to deactivate additional services - if required’.

The items identified to measure the variable customer satisfaction of customers of mobile telecom services are: really satisfied with my service provider, service provider is competent enough to fulfill the expectations and choice to associate with the service provider is a wise decision.

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All items of the variables are measured by using Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of the respective variables.

**Hypothesis 4**

There is significant relationship between the service related factors specifically service benefits, customer support services, quality of service, competitive pricing, tariff variety and unethical practices in mobile telecom services sector and customer satisfaction.

**Testing of hypothesis: Logistic regression analysis**

The logistic regression analysis was performed to find out the predictors of customer satisfaction. The customer satisfaction is taken as the dependent variable. The independent variables taken are service benefits, customer support services, quality of service, competitive pricing, tariff variety and unethical practices of the mobile telecom service providers. In order to identify the effect of demographic characteristics of the respondents on customer satisfaction, the variables age, education and income are also included as independent variables in the logistic regression analysis. The test results are presented in the table 3.6.1.
Table 3.6.1
The results of logistic regression analysis on the predictors of customer satisfaction of mobile telecom services

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds Ratio</th>
<th>95% CI*</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group (in years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;=30</td>
<td>1.04</td>
<td>0.75-1.43</td>
<td>0.832</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below graduation</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduation and above</td>
<td>1.05</td>
<td>0.71-1.56</td>
<td>0.802</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.42</td>
<td>0.96-2.11</td>
<td>0.072</td>
</tr>
<tr>
<td><strong>Service Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2.97</td>
<td>2.15-4.10</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Customer Support Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2.01</td>
<td>1.42-2.84</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Quality of Service</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>3.07</td>
<td>2.17-4.34</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Competitive pricing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>3.82</td>
<td>2.70-5.39</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Tariff variety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.27</td>
<td>0.89-1.80</td>
<td>0.184</td>
</tr>
<tr>
<td><strong>Unethical practices</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2.68</td>
<td>1.88-3.85</td>
<td>0.000</td>
</tr>
</tbody>
</table>
*CI: Confidence Interval.

The service benefits, customer support services, quality of service, competitive pricing, and unethical practices are significantly associated with customer satisfaction. The service related factor tariff variety and the demographic
variables of respondents’ age, education and income are not significantly associated with customer satisfaction.

The delivery of high level of service benefits by the mobile service providers to the customers was found to be three times higher chance to have better customer satisfaction compared to the low level delivery of service benefits. The customer satisfaction was found to be two times higher for high level of customer support services compared to the low level of customer support services. The high level of quality of service contributes to three times more customer satisfaction than that of low level of quality of service. The customer satisfaction was 3.8 times higher for high level of competitive pricing compared to its low level. The low level of unethical practice was found have three times higher chance to generate better customer satisfaction as compared to high level of unethical practices of mobile telecom service providers.

3.6.1 Customer Satisfaction and customer loyalty of mobile telecom services

The customer satisfaction of customers of mobile telecom services are measured with three items. The items are: really satisfied with my service provider, service provider is competent enough to fulfill the expectations, and choice to associate with the service provider is a wise decision. The customer loyalty is also measured by three items. The items used to measure the customer loyalty are: strong intention to remain as a customer of the service provider, would recommend the services of the mobile service provider to friends / colleagues, and the emotional attachment with my service provider. All items are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of customer satisfaction and customer loyalty.

Hypothesis 4.1

There is significant relationship between customer satisfaction and customer loyalty among the customers of mobile telecom services.
Testing of hypothesis: Correlation analysis

The correlation analysis is performed to identify the extent to which two or more things are related to one another. The correlation coefficient varies from -1.0 to +1.0. The value of -1.0 indicates a perfect negative correlation and +1.0 indicates a perfect positive correlation. A correlation coefficient zero means there is no relationship between the variables. As the distribution of the variables customer satisfaction and customer loyalty are significantly non normal, the non-parametric correlation analysis, Spearman’s rho is used is ascertain the relationship between the variables. The test results are shown in table 3.6.2.

<table>
<thead>
<tr>
<th>Correlations - Spearman's rho</th>
<th>Details</th>
<th>Customer satisfaction</th>
<th>Customer loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer satisfaction</td>
<td>Correlation Coefficient</td>
<td>1.000</td>
<td>.773**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>1080</td>
<td>1080</td>
</tr>
<tr>
<td>Customer loyalty</td>
<td>Correlation Coefficient</td>
<td>.773**</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>1080</td>
<td>1080</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

The test results indicate that the correlation is significant and the customer satisfaction of customers of mobile telecom services has high positive correlation (correlation coefficient 0.773) with customer loyalty.

3.7 Third generation (3G) mobile telecommunication services: Analysis of marketing strategies of BSNL and private sector mobile telecom service providers in Kerala

In the comparative study of marketing strategies related to the third generation (3G) mobile telecommunication services in Kerala, the major 3G mobile
telecom service providers: Idea, BSNL, Vodafone, Airtel and Tata Docomo are primarily considered. The mobile subscriber base in Kerala as on March 2013 is 306.89 lakhs. More than 80% of market share of mobile telecom services in Kerala are maintained by the service providers Idea (25.81%), BSNL (25.17%), Vodafone (20.21%) and Airtel (11.41%). These service providers uphold first, second, third and fourth positions respectively in the mobile telecom services market in Kerala.\(^{19}\) The Tata Docomo shares a significant role in 3G mobile telecom services sector in Kerala along with these prominent players. In total of 1080 respondents in the survey, 254 of them are customers of 3G mobile telecom services. The distribution of most preferred 3G service providers of sample respondents is given in the table 3.7.1. It can be seen that 90% of 3G users among the respondents belonging to the service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo.

**Table 3.7.1**

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>19.7</td>
<td>43.7</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>16.1</td>
<td>59.8</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>13.4</td>
<td>73.2</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>16.5</td>
<td>89.7</td>
</tr>
<tr>
<td>Reliance</td>
<td>11</td>
<td>4.3</td>
<td>94</td>
</tr>
<tr>
<td>Aircel</td>
<td>7</td>
<td>2.8</td>
<td>96.8</td>
</tr>
<tr>
<td>MTS</td>
<td>8</td>
<td>3.1</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>254</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

**Hypothesis 5**

There is significant difference between the marketing strategies related to the third generation (3G) mobile telecommunication services of BSNL and private sector mobile telecom service providers in Kerala.

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\(^{19}\) Press releases on subscriber data, March 2013. Telecom Regulatory Authority of India. www.trai.gov.in
Variables considered for the analysis

The variables considered for the analysis of marketing strategies related to the third generation (3G) mobile telecommunication services of mobile telecom service providers in Kerala are: basic service benefits of 3G mobile telecom services, quality of service, pricing strategies and promotion strategies.

The basic service benefits of 3G mobile telecom services are measured by the items easiness to get connected, mobile 3G network coverage, easiness of handset settings, speed of downloading, 3G roaming facility and service support. The quality of service is measured based on the five distinct dimensions of quality of service specifically tangibility, reliability, responsiveness, assurance and empathy. The items set to measure the variable quality of service are: ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’. The pricing strategies are measured by the items: ‘Variety of tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’. The promotion strategies of 3G mobile service providers are studied based on three important variables specifically attractiveness of 3G price reduction offers, attractiveness of 3G free trial offer and attractiveness of displays and demonstrations at point of sales.

All items of the variables are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Certain, Disagree and Strongly Disagree.

All the variables considered for the analysis of marketing strategies related to the third generation (3G) mobile telecommunication services of mobile telecom service providers are separately tested with following hypotheses.

3.7.1 Basic service benefits of 3G mobile telecom services

The variable considered for the analysis is basic service benefits of 3G mobile telecom services. The items used to measure the variable are: ‘It is very easy to get connected to the 3G mobile telecom services’, ‘The network provides good geographical coverage for 3G mobile telecom services’, ‘The handset settings for
the mobile internet is really user-friendly’, ‘The speed of downloading is very high’, ‘The Roaming facility for 3G mobile telecom services is excellent’, and ‘The service provider extends excellent service support for 3G mobile telecom services’.

**Hypothesis 5.1**

The basic service benefits of 3G mobile telecom services specifically easiness to get connected, mobile 3G network coverage, easiness of handset settings, speed of downloading, 3G roaming facility and service support significantly differ between BSNL and private sector telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables specifically ‘Easiness to get connected’, ‘mobile 3G network coverage’, ‘Easiness of handset settings’, ‘Speed of downloading’, ‘3G roaming facility’ and ‘Service support’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Easiness to get connected’, ‘mobile 3G network coverage’, ‘Easiness of handset settings’, ‘Speed of downloading’, ‘3G roaming facility’ and ‘Service support’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that the variances of the groups have homogeneous variances. Even though the groups have homogeneous variances, as the data are not normally distributed, the Kruskal-Wallis test is used to test the Hypothesis 5.1.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variables ‘Easiness to get connected’, ‘mobile 3G network coverage’, ‘Easiness of handset settings’, ‘Speed of downloading’, ‘3G roaming facility’ and ‘Service support’ of the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo has been computed with Kruskal-Wallis test. The test results are given in the table 3.7.2.
Table 3.7.2
Mean ranking of basic benefits delivered by 3G mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Mobile 3G handset settings are easy</th>
<th>Mobile 3G downloading speed high</th>
<th>Mobile 3G roaming facility is excellent</th>
<th>Mobile 3G service support is excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td>115.34</td>
<td>128.49</td>
<td>109.19</td>
<td>114.97</td>
<td>113.84</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>94.63</td>
<td>116.81</td>
<td>95.25</td>
<td>102.39</td>
<td>120.61</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>124.71</td>
<td>134.41</td>
<td>131.66</td>
<td>120.60</td>
<td>131.23</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>118.38</td>
<td>127.76</td>
<td>122.15</td>
<td>113.21</td>
<td>124.81</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>123.83</td>
<td>61.25</td>
<td>122.19</td>
<td>123.33</td>
<td>83.51</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.3 shows the test statistic for the Kruskal-Wallis test based on basic benefits delivered by the 3G mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is five, the degrees of freedom will be four.

Table 3.7.3
Kruskal-Wallis test statistics based on basic benefits delivered by 3G mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Easy to get connected to the 3G mobile network</th>
<th>Excellent Geographical 3G Network Coverage</th>
<th>Mobile 3G handset settings are easy</th>
<th>Mobile 3G downloading speed high</th>
<th>Mobile 3G roaming facility is excellent</th>
<th>Mobile 3G service support is excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td>df</td>
<td>Asymp. Sig.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.079</td>
<td>.000</td>
<td>.000</td>
<td>.027</td>
<td>.480</td>
<td>.005</td>
<td>.001</td>
</tr>
</tbody>
</table>

Grouping variable: Mobile 3G service provider
The descriptive statistics of the variables ‘Easy to get connected to the 3G mobile network’, ‘Excellent geographical 3G network coverage’, and ‘Mobile 3G handset settings are easy’ is shown in the table 3.7.4 and descriptive statistics of the variables ‘Mobile 3G downloading speed high’, ‘Mobile 3G roaming facility is excellent’ and ‘Mobile 3G handset settings are easy’ is shown in the table 3.7.5.

**Table 3.7.4**

Descriptive statistics of basic benefits delivered by 3G mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Easy to get connected to the 3G mobile network*</th>
<th>Excellent geographical 3G network coverage*</th>
<th>Mobile 3G handset settings are easy*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>4.18</td>
<td>.785</td>
<td>3.64</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.90</td>
<td>.886</td>
<td>3.44</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>4.34</td>
<td>.575</td>
<td>3.76</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>4.21</td>
<td>.808</td>
<td>3.62</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>4.33</td>
<td>.570</td>
<td>2.48</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>4.18</td>
<td>.756</td>
<td>3.40</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Dissagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

**Table 3.7.5**

Descriptive statistics of basic benefits delivered by 3G mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mobile 3G downloading speed high*</th>
<th>Mobile 3G roaming facility is excellent*</th>
<th>Mobile 3G service support is excellent*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>3.92</td>
<td>.936</td>
<td>3.43</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.72</td>
<td>1.031</td>
<td>3.50</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>4.05</td>
<td>.773</td>
<td>3.63</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>3.88</td>
<td>.977</td>
<td>3.56</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>4.07</td>
<td>.778</td>
<td>2.98</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>3.92</td>
<td>.911</td>
<td>3.42</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Dissagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.
The summary of Kruskal-Wallis test statistics shown in table 3.7.3 indicates that the significance value is less than 0.05 for the variables ‘Excellent Geographical 3G Network Coverage’, ‘Mobile 3G handset settings are easy’, ‘Mobile 3G Roaming facility is excellent’, and ‘Mobile 3G service support is excellent’. Therefore, it can be concluded these variables significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value of the Kruskal-Wallis test is more than 0.05 for the variables ‘Easy to get connected to the 3G mobile network’, and ‘Mobile 3G downloading speed high’. Therefore, it can be concluded these variables do not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.7.2 and indicates that Idea, BSNL, Vodafone and Airtel have significantly higher levels in the value of the variable ‘Excellent Geographical 3G Network Coverage’. The descriptive statistics of the variable ‘Excellent Geographical 3G Network Coverage’ given in the table 3.7.4 also indicate comparatively high value of mean score for these telecom service providers. The ranking value, mean score and standard deviation shows that Vodafone is the best performer in respect of 3G geographical network coverage. The value of mean ranking of the variable ‘Excellent Geographical 3G Network Coverage’ is the lowest for the service provider Tata Docomo.

The value of mean ranking also indicates that, Vodafone, Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Mobile 3G handset settings are easy’ than the service providers Idea and BSNL. The descriptive statistics of the variable ‘Mobile 3G handset settings are easy’ given in the table 3.7.4 also agrees to this finding. The ranking value, mean score and standard deviation shows that Vodafone is the best in offering easy 3G handset setting for the customers.

The value of mean ranking based on Kruskal-Wallis also indicates that Idea, BSNL, Vodafone and Airtel have significantly higher level in the value of the variable ‘Mobile 3G Roaming facility is excellent’. The descriptive statistics of the variable ‘Mobile 3G Roaming facility is excellent’ given in the table 3.7.5 also
indicate comparatively high value of mean score for these telecom service providers. The ranking value, mean score and standard deviation shows that Vodafone is the best performer with respect to 3G roaming facility. The value of the variable ‘Mobile 3G roaming facility is excellent’ is the lowest for the service provider Tata Docomo.

The value of mean ranking based on Kruskal-Wallis test indicates that, Idea, Vodafone, Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Mobile 3G service support is excellent’. The descriptive statistics of the variable ‘Mobile 3G service support is excellent’ given in the table 3.7.5 also indicate comparatively high value of mean score for these telecom service providers. The ranking value, mean score and standard deviation shows that Idea and Airtel are at the top performers in providing excellent service support to their mobile 3G the customers. The value of the variable ‘Mobile 3G service support is excellent’ is the lowest for the service provider BSNL.

3.7.2 Quality of service of 3G mobile telecom service providers

The variable considered for the analysis is quality of service of 3G mobile telecom services. The items used to measure the variable are: ‘The service provider has modern Facilities for the customers’, ‘The 3G mobile telecom services are dependable’, ‘The service provider responds to the customer needs on time’, ‘The employees are knowledgeable and polite to the customers’, ‘The employees of service provider do understand the needs of their customers and give personal attention to them’.

Hypothesis 5.2

The quality of service of 3G Mobile Services specifically ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’ significantly differ between BSNL and private sector telecom service providers in Kerala.
Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables specifically ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that the majority of the variables have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 5.2.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’ of the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo has been computed with Kruskal-Wallis test. The test results are given in the table 3.7.6.
Table 3.7.6

Mean ranking of quality of service of 3G mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Modern facilities for customers</th>
<th>Services are dependable</th>
<th>Ready to respond to the customer needs</th>
<th>Employees are knowledgeable and polite</th>
<th>Understand the needs and give personal attention to them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td>126.80</td>
<td>120.43</td>
<td>119.43</td>
<td>119.38</td>
<td>124.00</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>97.90</td>
<td>104.33</td>
<td>81.57</td>
<td>96.27</td>
<td>87.02</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>118.48</td>
<td>121.76</td>
<td>136.67</td>
<td>119.20</td>
<td>119.39</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>118.49</td>
<td>132.63</td>
<td>124.43</td>
<td>129.90</td>
<td>126.59</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>109.30</td>
<td>96.24</td>
<td>116.87</td>
<td>112.07</td>
<td>118.86</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.7 shows the test statistic for the Kruskal-Wallis test based on quality of service of 3G mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is five, the degrees of freedom will be four.

Table 3.7.7

Kruskal-Wallis test statistics based on quality of service of 3G mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Modern facilities for customers</th>
<th>Services are dependable</th>
<th>Ready to respond to the customer needs</th>
<th>Employees are knowledgeable and polite</th>
<th>Understand the needs and give personal attention to them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>8.721</td>
<td>10.813</td>
<td>22.358</td>
<td>9.048</td>
<td>15.596</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.068</td>
<td>.029</td>
<td>.000</td>
<td>.060</td>
<td>.004</td>
</tr>
</tbody>
</table>

Grouping variable: Mobile 3G service provider
The table 3.7.8 shows the descriptive statistics of the variables ‘Modern facilities for customers’, ‘Services are dependable’, ‘Ready to respond to the customer needs’, ‘Employees are knowledgeable and polite’ and ‘Understand the needs and give personal attention to them’ pertaining to the 3G mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo.

**Table 3.7.8**
Descriptive statistics of quality of service of 3G mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Modern facilities for customers</th>
<th>Services are dependable</th>
<th>Ready to respond to the customer needs</th>
<th>Employees are knowledgeable and polite</th>
<th>Understand the needs and give personal attention to them</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>4.10</td>
<td>.651</td>
<td>3.90</td>
<td>.831</td>
<td>3.82</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.74</td>
<td>.694</td>
<td>3.66</td>
<td>.872</td>
<td>3.26</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>4.02</td>
<td>.570</td>
<td>3.98</td>
<td>.570</td>
<td>4.07</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>4.00</td>
<td>.739</td>
<td>4.03</td>
<td>.870</td>
<td>3.85</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>3.93</td>
<td>.407</td>
<td>3.62</td>
<td>.661</td>
<td>3.83</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>3.96</td>
<td>.632</td>
<td>3.83</td>
<td>.786</td>
<td>3.75</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.7.7 indicates that the significance value is less than 0.05 for the variables ‘Services are dependable’, ‘Ready to respond to the customer needs’, and ‘Understand the needs and give personal attention to them’. Therefore, it can be concluded these variables significantly differ between BSNL and private sector telecom service providers in Kerala.

The significance value of the Kruskal-Wallis test is more than 0.05 for the variables ‘Modern facilities for customers’, and ‘Employees are knowledgeable and polite’. Therefore, it can be concluded these variables do not significantly differ between BSNL and private sector telecom service providers in Kerala.
The value of mean ranking based on Kruskal-Wallis test given in table 3.7.6 indicates that Idea, Vodafone and Airtel have significantly higher level in the value of the variable ‘Services are dependable’. The descriptive statistics of the variable ‘Services are dependable’ given in the table 3.7.8 also indicate comparatively high value of mean score for these telecom service providers. The values of mean ranking of the variable ‘Services are dependable’ are comparatively lesser for the service providers BSNL and Tata Docomo than other service providers.

The value of mean ranking based on Kruskal-Wallis test also indicates that, Idea, Vodafone, Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Ready to respond to the customer needs’. The descriptive statistics of the variable ‘Ready to respond to the customer needs’ given in the table 3.7.8 also indicates comparatively high value of mean score for these telecom service providers. The ranking value, mean score and standard deviation show that Vodafone is at the top with respect to the value of the variable ‘Ready to respond to the customer needs’. The lowest rating in the value of this variable is for the service provider BSNL.

The value of mean ranking also indicates that, Idea, Vodafone, Tata Docomo and Airtel have significantly higher levels in the values of the variable ‘Understand the needs and give personal attention to them’. The descriptive statistics of the variable also indicate comparatively high value of mean score for these service providers. The lowest rating in the value of this variable is for the service provider BSNL.

### 3.7.3 Pricing strategies of 3G mobile telecom service providers

The variable considered for the analysis is pricing strategies of 3G mobile telecom service providers. The items used to measure the variable are: ‘Attractive varieties of tariff plans are offered in the 3G mobile telecom services’, ‘The charging is transparent and there are no hidden charges’, ‘The 3G mobile telecom services deliver the real value for money spend on it’, and ‘The pricing of my 3G mobile telecom services are better as compared to competition service providers’.
Hypothesis 5.3

The pricing strategies of 3G Mobile Services specifically ‘Variety of tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’ significantly differ between BSNL and private sector telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables specifically ‘Variety of Tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that sample distributions of the variables are significantly non-normal.

Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Variety of tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that the majority of the variables have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 5.3.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Variety of Tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’ of the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo has been computed with Kruskal-Wallis test. The test results are given in the table 3.7.9.
Table 3.7.9
Mean ranking of pricing strategies of 3G mobile service providers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Mean rank</th>
<th>Variety of tariff plans in 3G services</th>
<th>Transparent billing and no hidden charges in 3G services</th>
<th>Value for money in 3G services</th>
<th>Better pricing for 3G services as compared to others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td>96.60</td>
<td>84.90</td>
<td>100.73</td>
<td>95.04</td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>112.41</td>
<td>138.53</td>
<td>113.96</td>
<td>109.86</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>104.32</td>
<td>121.41</td>
<td>119.57</td>
<td>108.24</td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>129.06</td>
<td>125.94</td>
<td>110.32</td>
<td>112.00</td>
<td></td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>141.14</td>
<td>112.87</td>
<td>133.57</td>
<td>156.42</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.10 shows the test statistic for the Kruskal-Wallis test based on pricing strategies of 3G mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is five, the degrees of freedom will be four.

Table 3.7.10
Kruskal-Wallis test statistics based on the pricing strategies of 3G mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Variety of tariff plans in 3G services</th>
<th>Transparent billing and no hidden charges in 3G services</th>
<th>Value for money in 3G services</th>
<th>Better pricing for 3G services as compared to others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>18.829</td>
<td>26.039</td>
<td>8.445</td>
<td>26.952</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.001</td>
<td>.000</td>
<td>.077</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping variable: Mobile 3G service provider

The table 3.7.11 shows the descriptive statistics of the variables ‘Variety of tariff plans’, ‘Transparent billing’, ‘Value for money’ and ‘Better pricing’
pertaining to the 3G mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo.

Table 3.7.11
Descriptive statistics of pricing strategies of 3G mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Variety of Tariff plans*</th>
<th>Transparent Billing*</th>
<th>Value for Money*</th>
<th>Better Pricing*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>3.54</td>
<td>.787</td>
<td>3.33</td>
<td>.831</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.70</td>
<td>.814</td>
<td>3.98</td>
<td>.654</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>3.63</td>
<td>.767</td>
<td>3.76</td>
<td>.734</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>3.94</td>
<td>.814</td>
<td>3.79</td>
<td>.914</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>4.12</td>
<td>.550</td>
<td>3.69</td>
<td>.517</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>3.76</td>
<td>.779</td>
<td>3.68</td>
<td>.772</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.7.10 indicates that the significance value is less are than 0.05 for the variables ‘Variety of tariff plans’, ‘Transparent billing’, and ‘Better pricing’. Therefore, it can be concluded these variables significantly differ between BSNL and private sector telecom service providers in Kerala.

The significance value of the Kruskal-Wallis test is more than 0.05 for the variable ‘Value for money’. Therefore, it can be concluded this variables do not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.7.9 indicates that Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Variety of tariff plans in 3G services’. The values are comparatively low for Idea, BSNL, and Vodafone. The descriptive statistics of the variable ‘Variety of tariff plans in 3G services’ given in the table 3.7.11 also agrees to these results.

The value of mean ranking also indicates that, BSNL, Vodafone, Tata Docomo and Airtel have significantly higher level in the value of the variable
‘Transparent billing and no hidden charges in 3G services’. The value of ranking is the lowest for the service provider Idea. The descriptive statistics of the variable ‘Transparent billing and no hidden charges in 3G services’ also agrees to these results. The ranking value, mean score and standard deviation show that BSNL has the highest rating in the value of the variable ‘Transparent billing and no hidden charges in 3G services’.

The value of mean ranking based on Kruskal-Wallis also indicates that Tata Docomo has the highest level in the value of the variable ‘Better pricing for 3G services as compared to others’. The Service providers BSNL, Vodafone and Airtel show moderate ranking. The value of ranking of the variable is the lowest for the service provider Idea. The descriptive statistics of the variable ‘Better pricing for 3G services as compared to others’ also agrees to these results. The ranking value, mean score and standard deviation show that Tata Docomo is the best performer with respect to Better pricing for 3G services.

3.7.4 Promotion strategies of 3G mobile telecom service providers

The promotion strategies of 3G mobile service providers are studied based on three important variables specifically attractiveness of 3G price reduction offers, attractiveness of 3G free trial offer and attractiveness of displays and demonstrations at point of sales.

Attractiveness of price reduction offers of 3G mobile telecom service providers

The attractiveness of promotional offers of 3G mobile telecom service providers is measured by a dichotomous question to verify whether the customer has received the offers, followed by five point Likert scale to test the attractiveness of the offers. The frequency descriptive analysis of attractiveness of price reduction offers of mobile telecom service providers is given in table 3.7.12.
Table 3.7.12
Attractiveness of price reduction offers of 3G mobile telecom service providers

<table>
<thead>
<tr>
<th>Mobile 3G service provider</th>
<th>Rebate / Price reduction offers received in 3G services</th>
<th>Total</th>
<th>Rebate / Price reduction offers are attractive in 3G services*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>25</td>
<td>36</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>(41.0%)</td>
<td>(59.0%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>BSNL</td>
<td>8</td>
<td>42</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>(16.0%)</td>
<td>(84.0%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Vodafone</td>
<td>16</td>
<td>25</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>(39.0%)</td>
<td>(61.0%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>10</td>
<td>24</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>(29.4%)</td>
<td>(70.6%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>37</td>
<td>5</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>(88.1%)</td>
<td>(11.9%)</td>
<td>(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>132</td>
<td>228</td>
</tr>
<tr>
<td></td>
<td>(42.1%)</td>
<td>(57.9%)</td>
<td>(100%)</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The 3G mobile service provider Tata Docomo is so aggressive in offering price reduction to most of its customers. The performance of other private providers is moderate in reaching their customers with this offer as compared to Tata Docomo. The BSNL reach among respondents with this offer is very less as compared all other private providers. Among the service providers the most attractive price reduction offer is from Airtel followed by BSNL.

**Attractiveness of free trial offers of 3G mobile telecom service providers**

The attractiveness of free trial offers of 3G mobile telecom service providers is measured by a dichotomous question to verify whether the customer has received the offers, followed by five point Likert scale to test the attractiveness of the offers. The frequency descriptive analysis of attractiveness of 3G free trial offers of mobile telecom service providers is shown in table 3.7.13.
### Table 3.7.13
Attractiveness of free trial offers of 3G mobile telecom service providers

<table>
<thead>
<tr>
<th>Mobile 3G service provider</th>
<th>Free trial offer received in 3G services</th>
<th>Free trial offer is attractive in 3G services*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Idea</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>(49.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSNL</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>(16.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>(63.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airtel</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>(38.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>(76.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>119</td>
</tr>
<tr>
<td>(47.8%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The service provider Tata Docomo is highly aggressive in the promotion of 3G services through free trial offers. The immediate follower is Vodafone. The offers of all the service providers are highly attractive. The most attractive 3G free trial offers are from Airtel and Tata Docomo. The private sector service providers are extremely successful in reaching their customers with this offer. The service provider BSNL seems to be a failure to reach the customers with their offers, even though the offers are attractive.

### Attractiveness of displays and demonstrations at point of sales of 3G mobile telecom service providers

The attractiveness of displays and demonstrations at point of sales of 3G mobile telecom service providers is measured by a dichotomous question to verify whether the customer has listened to them, followed by five point Likert scale to test the attractiveness of the displays and demonstrations. The frequency descriptive
The service provider Tata Docomo is forefront in promoting the 3G services through the POS displays and demonstrations. The POS displays and demonstrations of all the service providers are attractive. The highest ranking with respect to the attractiveness of POS displays and demonstrations are for the service provider Airtel and the lowest rating is for BSNL.

**Customer satisfaction of 3G mobile customers**

The customer satisfaction of 3G mobile customers is measured by three items. The items are: really satisfied with my 3G mobile telecom services, service provider is competent enough to fulfill the expectations, choice to associate with the service provider for 3G mobile telecom services is a wise decision and would recommend the services of the mobile service provider to others. All items of the variable are measured by using Likert Scale with five anchor points, specifically
Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of the variable.

**Hypothesis 5.4**

The customer satisfaction of 3G mobile customers significantly differ between BSNL and private sector telecom service providers in Kerala.

**Normality of sample distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of the variable specifically ‘customer satisfaction of 3G mobile customers’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that sample distributions of the variables are significantly non-normal.

**Homogeneity of variance of sample distribution**

The Levene’s test is used to verify the homogeneity of variances of the variable ‘customer satisfaction of 3G mobile customers’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that the variable has heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 5.4.

**Testing of hypothesis: Kruskal-Wallis test**

The summary of ranked data corresponding to the variable ‘customer satisfaction of 3G mobile customers’ of the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo has been computed with Kruskal-Wallis test. The test results are given in the table 3.7.15.
Table 3.7.15
Mean ranking of customer satisfaction of 3G mobile customers based on Kruskal-Wallis test

<table>
<thead>
<tr>
<th>Customer satisfaction 3G mobile customers</th>
<th>Mobile 3G service provider</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td></td>
<td>107.35</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td></td>
<td>113.83</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td></td>
<td>119.06</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td></td>
<td>128.76</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td></td>
<td>109.68</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.16 shows the test statistic for the Kruskal-Wallis test based on customer satisfaction of 3G mobile customers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is five, the degrees of freedom will be four.

Table 3.7.16
Kruskal-Wallis test statistics based on customer satisfaction 3G mobile customers

<table>
<thead>
<tr>
<th>Details</th>
<th>Customer satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>2.831</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.586</td>
</tr>
</tbody>
</table>

Grouping variable: Mobile 3G Provider

The table 3.7.17 shows the descriptive statistics of the variable ‘customer satisfaction of 3G mobile customers’ pertaining to the 3G mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo.
Table 3.7.17

Descriptive statistics of customer satisfaction of 3G mobile customers

<table>
<thead>
<tr>
<th>Mobile 3G service provider</th>
<th>Mean*</th>
<th>N</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>3.6393</td>
<td>61</td>
<td>.70048</td>
</tr>
<tr>
<td>BSNL</td>
<td>3.6650</td>
<td>50</td>
<td>.76866</td>
</tr>
<tr>
<td>Vodafone</td>
<td>3.7500</td>
<td>41</td>
<td>.61998</td>
</tr>
<tr>
<td>Airtel</td>
<td>3.8456</td>
<td>34</td>
<td>.81885</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>3.7500</td>
<td>42</td>
<td>.39043</td>
</tr>
<tr>
<td>Total</td>
<td>3.7160</td>
<td>228</td>
<td>.67458</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Kruskal-Wallis test statistics shown in table 3.7.16 indicates that the significance value is more than 0.05 for the variable ‘customer satisfaction of 3G mobile customers’. Therefore, it can be concluded this variables do not significantly differ between BSNL and private sector telecom service providers in Kerala. The value of mean ranking based on Kruskal-Wallis test given in table 3.7.15 and the descriptive statistics of the variable ‘customer satisfaction of 3G mobile customers’ given in the table 3.7.17 also agrees to this result. The mean value shows that customers are moderately satisfied with their 3G service providers.

Customer satisfaction and service related factors of 3G mobile telecommunication services

The important service related factors which directly affect customer satisfaction of customers of 3G mobile telecom services are: 3G service benefits, quality of 3G services and pricing of 3G services. The 3G service benefits are measured using six items specifically easiness to get connected, geographical network coverage, user-friendliness of handset settings, speed of downloading, roaming facility and service support with respect to 3G mobile telecom services. The quality of 3G services are measured by five items consists of modern facilities for the customers, services are dependable, responds to the customer needs on time, the employees are knowledgeable and polite to the customers, and understand the
needs of the customers and give personal attention to them. The pricing of 3G services are measured using four items specifically attractive varieties of tariff plans, charging is transparent and there are no hidden charges, deliver the real value for money spend on it and pricing is better as compared to competition service providers.

All items of the variables are measured by using Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of the respective variables.

**Hypothesis 5.5**

There is significant relationship between the service related factors specifically service benefits, quality of service and pricing of 3G mobile telecommunication services and customer satisfaction.

**Testing of hypothesis: Correlation analysis**

The distribution of the variables customer satisfaction, 3G service benefits, quality of 3G services and pricing of 3G services are significantly non normal. Therefore the non-parametric correlation analysis, Spearman’s rho is used is ascertain the relationship between the variables. The correlation coefficient varies from -1.0 to +1.0. The value of -1.0 indicates a perfect negative correlation and +1.0 indicates a perfect positive correlation. A correlation coefficient zero means there is no relationship between the variables. The test results are presented in the table 3.7.18.
Table 3.7.18
Customer satisfaction and service related factors of 3G mobile customers:
correlation analysis

<table>
<thead>
<tr>
<th>Details</th>
<th>Correlation Coefficient</th>
<th>Basic 3G benefits</th>
<th>Quality of 3G services</th>
<th>Pricing of 3G services</th>
<th>Customer satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G Service benefits</td>
<td>Correlation Coefficient</td>
<td>1.000</td>
<td>.601**</td>
<td>.329**</td>
<td>.650**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>254</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>Quality of 3G services</td>
<td>Correlation Coefficient</td>
<td>.601**</td>
<td>1.000</td>
<td>.293**</td>
<td>.514**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>254</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>Pricing of 3G services</td>
<td>Correlation Coefficient</td>
<td>.329**</td>
<td>.293**</td>
<td>1.000</td>
<td>.520**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>254</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>Correlation Coefficient</td>
<td>.650**</td>
<td>.514**</td>
<td>.520**</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>254</td>
<td>254</td>
<td>254</td>
<td>254</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

The test results indicate that the correlation is significant and the customer satisfaction of customers of 3G mobile telecom services has high positive correlation with basic service benefits (correlation coefficient 0.650), quality of service (correlation coefficient 0.514) and pricing of services (correlation coefficient 0.520).
3.7.5 Factors influenced to subscribe for the 3G mobile telecom services of a particular service provider

The suggested possible factors which influence to subscribe for 3G mobile telecom services of a particular service provider are:

i. Attractive offers as compared to other service providers.

ii. Attractive pricing as compared to other service providers.

iii. The friendly customer support services.

iv. The image and reputation of the service provider.

v. The advertisements of the service provider.

vi. The recommendation by Friends / Family members.

vii. The 3G mobile telecom services are essential for the customer.

All the factors mentioned above are measured by using Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree.

Hypothesis 5.6

The factors influenced to subscribe for the 3G mobile telecom services of a service provider specifically ‘Attractive offers’, ‘Attractive pricing’, ‘Support services’, ‘Image of service provider’ ‘Advertisements’, ‘Recommendation by friends or family members’, and ‘Essential need for the services’ significantly differ between BSNL and private sector telecom service providers in Kerala.

Normality of sample distribution

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables specifically ‘Attractive offers’, ‘Attractive pricing’, ‘Support services’, ‘Image of service provider’ ‘Advertisements’, ‘Recommendation by friends or family members’, and ‘Essential need for the services’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that sample distributions of the variables are significantly non-normal.
Homogeneity of variance of sample distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Attractive offers’, ‘Attractive pricing’, ‘Support services’, ‘Image of service provider’ ‘Advertisements’, ‘Recommendation by friends or family members’, and ‘Essential need for the services’ pertaining to the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo. The test results showed that majority of the variables have heterogeneous variances. Therefore the Kruskal-Wallis test is used to test the Hypothesis 5.6.

Testing of hypothesis: Kruskal-Wallis test

The summary of ranked data corresponding to the variables ‘Attractive offers’, ‘Attractive pricing’, ‘Support services’, ‘Image of service provider’ ‘Advertisements’, ‘Recommendation by friends or family members’, and ‘Essential need for the services’ of the mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo has been computed with Kruskal-Wallis test. The test results are given in the table 3.7.19.

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Attractive offers</th>
<th>Attractive pricing</th>
<th>Friendly customer support services</th>
<th>Image and reputation of the service provider</th>
<th>Advertisements</th>
<th>Recommendation by friends/ family members</th>
<th>Essential need for the services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>61</td>
<td>100.58</td>
<td>93.52</td>
<td>116.37</td>
<td>103.34</td>
<td>107.30</td>
<td>99.58</td>
<td>108.13</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>101.48</td>
<td>107.22</td>
<td>79.90</td>
<td>117.34</td>
<td>86.50</td>
<td>118.03</td>
<td>114.49</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>84.91</td>
<td>101.06</td>
<td>128.96</td>
<td>132.71</td>
<td>120.77</td>
<td>96.68</td>
<td>116.66</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>131.85</td>
<td>123.46</td>
<td>136.41</td>
<td>125.53</td>
<td>135.96</td>
<td>134.56</td>
<td>136.43</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>165.05</td>
<td>159.50</td>
<td>121.12</td>
<td>100.63</td>
<td>134.80</td>
<td>133.12</td>
<td>103.90</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table 3.7.20 shows the test statistic for the Kruskal-Wallis test based on factors influenced to subscribe for 3G mobile telecom services of the 3G mobile service providers, the associated degrees of freedom and the significance. As the number of mobile service providers considered for analysis is five, the degrees of freedom will be four.

Table 3.7.20
Kruskal-Wallis test statistics based factors influenced to subscribe for the 3G services of mobile service providers

<table>
<thead>
<tr>
<th>Details</th>
<th>Attractive offers</th>
<th>Attractive pricing</th>
<th>Friendly customer support services</th>
<th>Image and reputation of the service provider</th>
<th>Advertisements</th>
<th>Recommendation by friends/family members</th>
<th>Essential need for the services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>44.909</td>
<td>33.482</td>
<td>25.535</td>
<td>11.029</td>
<td>19.770</td>
<td>14.865</td>
<td>7.933</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.026</td>
<td>.001</td>
<td>.005</td>
<td>.094</td>
</tr>
</tbody>
</table>

Grouping variable: Mobile 3G service provider

The descriptive statistics of the variables ‘Attractive offers’, ‘Attractive pricing’, and ‘Friendly customer support services’ is shown in the table 3.7.21. The descriptive statistics of the variables ‘Image and reputation of the service provider’ ‘Advertisements’, ‘Recommendation by friends or family members’, and ‘Essential need for the services’ is shown in the table 3.7.22. These variables are pertaining to the 3G mobile service providers Idea, BSNL, Vodafone, Airtel and Tata Docomo.
Table 3.7.21
Descriptive statistics of factors influenced to subscribe for the 3G services of mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Attractive offers*</th>
<th>Attractive pricing*</th>
<th>Friendly customer support services*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>3.25</td>
<td>.994</td>
<td>3.34</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.28</td>
<td>.904</td>
<td>3.54</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>2.98</td>
<td>1.012</td>
<td>3.41</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>3.71</td>
<td>1.219</td>
<td>3.74</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>4.29</td>
<td>.508</td>
<td>4.31</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>3.46</td>
<td>1.038</td>
<td>3.64</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

Table 3.7.22
Descriptive Statistics of factors influenced to subscribe for the 3G services of mobile service providers

<table>
<thead>
<tr>
<th>Mobile Service Provider</th>
<th>N</th>
<th>Image and reputation of the service provider*</th>
<th>Advertisements*</th>
<th>Recommendation by friends/family members*</th>
<th>Essential need for the services*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Idea</td>
<td>61</td>
<td>3.69</td>
<td>.765</td>
<td>3.18</td>
<td>.992</td>
</tr>
<tr>
<td>BSNL</td>
<td>50</td>
<td>3.84</td>
<td>.889</td>
<td>2.84</td>
<td>.997</td>
</tr>
<tr>
<td>Vodafone</td>
<td>41</td>
<td>4.10</td>
<td>.490</td>
<td>3.39</td>
<td>.945</td>
</tr>
<tr>
<td>Airtel</td>
<td>34</td>
<td>3.97</td>
<td>.797</td>
<td>3.62</td>
<td>1.101</td>
</tr>
<tr>
<td>Tata Docomo</td>
<td>42</td>
<td>3.69</td>
<td>.643</td>
<td>3.60</td>
<td>.767</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>3.84</td>
<td>.748</td>
<td>3.29</td>
<td>.999</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.
The summary of Kruskal-Wallis test statistics shown in table 3.7.20 indicates that the significance value is less than 0.05 for the variables ‘Attractive offers’, ‘Attractive pricing’, ‘Support services’, ‘Image of service provider’ ‘Advertisements’, and ‘Recommendation by friends/family members’. Therefore, it can be concluded these variables significantly differ between BSNL and private sector telecom service providers in Kerala. The significance value of the Kruskal-Wallis test is more than 0.05 for the variable ‘Essential need for the services’. Therefore, it can be concluded this variable do not significantly differ between BSNL and private sector telecom service providers in Kerala.

The value of mean ranking based on Kruskal-Wallis test given in table 3.7.19 indicates that Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Attractive offers’. The values are moderate for Idea and BSNL, but the value is low for Vodafone. The descriptive statistics of the variable ‘Attractive offers’ given in the table 3.7.21 also agrees to this result.

The value of mean ranking also indicates that Tata Docomo has significantly higher level in the value of the variable ‘Attractive pricing’ The value is moderate for Airtel and comparatively low for Idea, vodafone and BSNL. The descriptive statistics of the variable ‘Attractive pricing’ also agrees to this result.

The value of mean ranking shows that private telecom service providers have significantly higher level in the values of the variable ‘Friendly customer support services’ than BSNL. The descriptive statistics of the variable ‘Friendly customer support services’ also agrees to this result.

The value of mean ranking also shows that Vodafone, Airtel, and BSNL have significantly higher level in the values of the variable ‘Image and reputation of the service provider’. The values are comparatively low for Idea and Tata Docomo. The descriptive statistics of the variable ‘Image and reputation of the service provider’ given in the table 3.7.22 also agrees to this result.

The value of mean ranking indicates that private telecom service providers have significantly higher level in the values of the variable ‘Advertisements’ than BSNL. It can also be seen that Tata Docomo and Airtel have significantly higher level in the value of the variable ‘Recommendation by friends/family members’. The
values are moderate for BSNL, and low for Vodafone and Idea. The descriptive statistics of these variables also agrees to these results.

The major factor which influenced to subscribe for the 3G mobile telecom services is the essential need of the customers for the services, irrespective of the service providers except Tata Docomo. The prime influencing factors with regard to Tata Docomo are attractive pricing and attractive offers. In general the factors, of the order of its weightage, which influenced the customers to subscribe for 3G services are: (i) Essential need for the services, (ii) Image and reputation of the service provider, (iii) Friendly customer support services, (iv) Attractive pricing, (v) Attractive offers, (vi) Recommendation by friends/family members, and (vii) Advertisements.

3.7.6 Adoption issues of 3G mobile internet services

The suggested possible reasons related to the adoption issues of 3G mobile internet services are:

i. Lack of network coverage of 3G mobile internet services.

ii. High pricing of 3G mobile internet services.

iii. High cost of 3G mobile handsets.

iv. Difficulty to learn the method of operation of 3G handsets.

v. The services are not essential for the customer

The adoption issues of 3G mobile internet services are different for customers of different demographic profiles. The demographic variables age, education and income of the respondents are considered for the analysis of adoption issues. Based on each of these demographic variables the respondents are grouped into two categories. The categories are: (i) the respondents with age - up to 30 years and age - above 30 years (ii) the respondents with educational profile - graduation and above, and educational profile - below graduation (iii) the respondents with annual income - up to 2 lakhs and annual income - more than 2 lakhs.
The distribution of sample respondents by 3G mobile user status is given in the table 3.7.23. It shows that 23.5% of the respondents are using 3G mobile telecom services.

**Table 3.7.23**

**Distribution of sample respondents by 3G mobile user status**

<table>
<thead>
<tr>
<th>3G mobile user status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G mobile users</td>
<td>254</td>
<td>23.5</td>
</tr>
<tr>
<td>Non-3G mobile users</td>
<td>826</td>
<td>76.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1080</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of awareness level of non-3G users of sample respondents is given in the table 3.7.24. Among non-3G mobile users more than 50% of sample respondents are aware of 3G mobile telecom services.

**Table 3.7.24**

**Distribution of awareness level of non-3G mobile users of sample respondents**

<table>
<thead>
<tr>
<th>Awareness level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware of 3G Services</td>
<td>426</td>
<td>51.6</td>
</tr>
<tr>
<td>Unaware of 3G Services</td>
<td>400</td>
<td>48.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>826</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of age group of sample respondents who are aware but non-users of 3G mobile internet services are given in table 3.7.25. It can be seen that nearly 60% of this segment belonging to the age group up to 30 years.
Table 3.7.25
Distribution of age group of sample respondents who are aware but non-users of 3G mobile internet services

<table>
<thead>
<tr>
<th>Age group (in years)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 30</td>
<td>253</td>
<td>59.4</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>173</td>
<td>40.6</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of educational profile of sample respondents who are aware but non-users of 3G mobile internet services are given in table 3.7.26. It can be seen that 73% of this segment belonging to the customers of high educational profile.

Table 3.7.26
Distribution of educational profile of sample respondents who are aware but non-users of 3G mobile internet services

<table>
<thead>
<tr>
<th>Educational profile</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Graduation</td>
<td>114</td>
<td>26.8</td>
</tr>
<tr>
<td>Graduation and Above</td>
<td>312</td>
<td>73.2</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The distribution of annual income of sample respondents who are aware but non-users of 3G mobile internet services are given in table 3.7.27. It can be seen that nearly 64% of this segment belonging to annual family income more than 2 lakhs.
Table 3.7.27
Distribution of annual family income of sample respondents who are aware but non-users of 3G mobile internet services

<table>
<thead>
<tr>
<th>Annual family income (in lakhs of Rupees)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 2</td>
<td>151</td>
<td>35.4</td>
</tr>
<tr>
<td>&gt; 2</td>
<td>275</td>
<td>64.6</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Survey.

In total of 1080 sample respondents, 254 of them are 3G users and among the remaining 826 non-3G users, 426 respondents are aware of 3G mobile internet services. The adoption issues are studied among the respondents who are aware of 3G mobile services but not using the services.

**Hypothesis 5.7**

The factors affecting adoption of 3G mobile internet services specifically ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ significantly differ in accordance with the demographic variables age, education and income of the respondents.

**Normality of Sample Distribution**

The Kolmogorov-Smirnov test and Shapiro-Wilk test are used to verify the normality of distribution of variables specifically ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to the respondents who are aware of 3G mobile services but not using the services. The test results showed that sample distributions of the variables are significantly non-normal.
Homogeneity of variance of Sample Distribution

The Levene’s test is used to verify the homogeneity of variances of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to the respondents who are aware of 3G mobile services but not using the services. The test results showed that the variables have homogeneous variances. Even though the groups have homogeneous variances, as the data are not normally distributed, the Mann-Whitney U test is used to test the Hypothesis 5.7.

Testing of hypothesis: Mann-Whitney U test based on age group of the respondents

The summary of ranked data corresponding to the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to the respondents who are aware of 3G mobile services but not using the services has been computed with Mann-Whitney U test. The test results with respect to age group of the respondents are given in the table 3.7.28.

Table 3.7.28
Mean ranking of factors affecting adoption of 3G mobile internet services with respect to the age group of respondents based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Details</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lack of 3G network coverage</td>
</tr>
<tr>
<td>Age up to 30</td>
<td>253</td>
<td>221.89</td>
</tr>
<tr>
<td>Age Above 30</td>
<td>173</td>
<td>201.24</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.29 shows the test statistic for the Mann-Whitney U test on the comparison of the variables ‘Lack of network coverage of 3G mobile internet
services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two groups of respondents: (i) age up to 30 years and (ii) age above 30 years.

Table 3.7.29

Factors affecting adoption of 3G mobile internet services: Mann - Whitney U test statistics based on the age group of respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>Lack of 3G network coverage</th>
<th>High pricing of 3G services</th>
<th>High cost of 3G mobile handsets</th>
<th>Difficulty to learn the method of operation of 3G handsets</th>
<th>The 3G services are not essential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>19763.000</td>
<td>15699.000</td>
<td>17157.500</td>
<td>14214.000</td>
<td>14751.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>34814.000</td>
<td>30750.000</td>
<td>32208.500</td>
<td>46345.000</td>
<td>46882.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.772</td>
<td>-5.156</td>
<td>-3.957</td>
<td>-6.701</td>
<td>-5.914</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.076</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Grouping variable: Age Group

The table 3.7.30 shows the descriptive statistics of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two groups of respondents: (i) age up to 30 years and (ii) age above 30 years.
Table 3.7.30

Descriptive statistics of factors affecting adoption of 3G mobile internet services with respect to the age group of respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>N</th>
<th>Lack of 3G network coverage*</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>High pricing of 3G services*</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>High cost of 3G mobile handsets*</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Difficulty to learn the method of operation of 3G handsets*</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>The 3G services are not essential *</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age up to 30</td>
<td>253</td>
<td>3.42</td>
<td>1.031</td>
<td>3.60</td>
<td>1.014</td>
<td>3.48</td>
<td>1.041</td>
<td>2.22</td>
<td>.737</td>
<td>3.09</td>
<td>1.247</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Above 30</td>
<td>173</td>
<td>3.24</td>
<td>.956</td>
<td>3.09</td>
<td>.958</td>
<td>3.11</td>
<td>.973</td>
<td>2.69</td>
<td>.750</td>
<td>3.81</td>
<td>1.138</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>3.35</td>
<td>1.004</td>
<td>3.39</td>
<td>1.021</td>
<td>3.33</td>
<td>1.029</td>
<td>2.41</td>
<td>.778</td>
<td>3.38</td>
<td>1.254</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4, Strongly Agree = 5; Mean Value of the Scale = 3.

The summary of Mann-Whitney U test statistics shown in table 3.7.29 indicates that the significance value is less than 0.05 for the variables ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’. Therefore, it can be concluded that these variables significantly differ between two age groups two groups of respondents: (i) age up to 30 years and (ii) age above 30 years. As the significance value is more than 0.05 for the variable ‘Lack of network coverage of 3G mobile services’, it doesn’t significantly differ between the two age groups.

The value of mean ranking shown in table 3.7.28 and descriptive statistics shown in table 2.3.30 indicate that the major 3G adoption issues of youngsters are high pricing of 3G services, high cost of 3G mobile handsets followed by the lack of 3G network coverage. They don’t find any difficulty in learning the method of operation of 3G handsets. But the major 3G adoption issue of elders is that, they could not identify the need of the 3G mobile services. The 3G network coverage is also an issue. Even though the learning difficulty in the operation of 3G handsets is not a serious adoption issue among the mobile customers, the elders perceived more learning difficulty in the operation of 3G handsets than youngsters.
Testing of hypothesis: Mann-Whitney U test based on educational profile of the respondents

The summary of ranked data corresponding to the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to the respondents who are aware of 3G mobile services but not using the services has been computed with Mann-Whitney U test. The test results with respect to educational profile of the respondents are given in the table 3.7.31.

Table 3.7.31
Mean ranking of factors affecting adoption of 3G mobile internet services with respect to the educational profile of respondents based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Educational profile</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lack of 3G network coverage</td>
</tr>
<tr>
<td>Below Graduation</td>
<td>114</td>
<td>202.00</td>
</tr>
<tr>
<td>Graduation and Above</td>
<td>312</td>
<td>217.70</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.32 shows the test statistic for the Mann-Whitney U test on the comparison of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two groups of respondents: (i) educational profile - graduation and above and (ii) educational profile - below graduation.
Table 3.7.32
Factors affecting adoption of 3G mobile internet services: Mann-Whitney U test statistics based on the educational profile of respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>Not using 3G services due to lack of coverage</th>
<th>Not using 3G services due to high price of services</th>
<th>Not using 3G services due to high cost of handset</th>
<th>Not using 3G services due to the difficulty in learning the method of operations</th>
<th>Not using 3G services due to no need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>16472.500</td>
<td>17019.500</td>
<td>16553.500</td>
<td>17689.500</td>
<td>16514.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>23027.500</td>
<td>65847.500</td>
<td>65381.500</td>
<td>66517.500</td>
<td>23069.000</td>
</tr>
<tr>
<td>Z</td>
<td>-1.216</td>
<td>-.707</td>
<td>-1.143</td>
<td>-.092</td>
<td>-1.168</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.224</td>
<td>.480</td>
<td>.253</td>
<td>.927</td>
<td>.243</td>
</tr>
</tbody>
</table>

Grouping variable: Educational Profile

The table 3.7.33 shows the descriptive statistics of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two groups of respondents: (i) educational profile - graduation and above and (ii) educational profile - below graduation.
Table 3.7.33
Descriptive statistics of factors affecting adoption of 3G mobile internet services with respect to the educational profile of respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Graduation</td>
<td>114</td>
<td>3.25</td>
<td>.920</td>
<td>3.45</td>
<td>.987</td>
<td>3.43</td>
<td>.968</td>
<td>2.42</td>
<td>.751</td>
<td>3.28</td>
<td>1.194</td>
</tr>
<tr>
<td>Graduation and Above</td>
<td>312</td>
<td>3.38</td>
<td>1.033</td>
<td>3.37</td>
<td>1.034</td>
<td>3.29</td>
<td>1.049</td>
<td>2.41</td>
<td>.788</td>
<td>3.42</td>
<td>1.275</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>3.35</td>
<td>1.004</td>
<td>3.39</td>
<td>1.021</td>
<td>3.33</td>
<td>1.029</td>
<td>2.41</td>
<td>.778</td>
<td>3.38</td>
<td>1.254</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The summary of Mann-Whitney U test statistics shown in table 3.7.32 indicates that the significance value is more than 0.05 for the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’. Therefore, it can be concluded that these variables do not significantly differ between two groups of respondents: (i) educational profile - graduation and above and (ii) educational profile - below graduation. The descriptive statistics shown in table 3.7.33 indicate that the lack of 3G network coverage, pricing of 3G services and handset, and unrecognized needs are fairly relevant adoption issues.

Testing of hypothesis: Mann-Whitney U test based on the income of the respondents

The summary of ranked data corresponding to the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to the respondents who are aware of 3G mobile services but not using the
services has been computed with Mann-Whitney U test. The test results with respect to the income of the respondents are given in the table 3.7.34.

Table 3.7.34
Mean ranking of factors affecting adoption of 3G mobile internet services with respect to the income of respondents based on Mann-Whitney U test

<table>
<thead>
<tr>
<th>Details</th>
<th>N</th>
<th>Mean rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lack of 3G network coverage</td>
</tr>
<tr>
<td>Up to 2 lakhs</td>
<td>151</td>
<td>203.56</td>
</tr>
<tr>
<td>More than 2 lakhs</td>
<td>275</td>
<td>218.96</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td></td>
</tr>
</tbody>
</table>

The table 3.7.35 shows the test statistic for the Mann-Whitney U test on the comparison of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two income groups of respondents: (i) annual income up to 2 lakhs and (ii) annual income more than 2 lakhs.
Table 3.7.35
Factors affecting adoption of 3G mobile internet services: Mann-Whitney U test statistics based on the income of respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>Not using 3G services due to lack of coverage</th>
<th>Not using 3G services due to high price of services</th>
<th>Not using 3G services due to high cost of handset</th>
<th>Not using 3G services due to the difficulty in learning the method of operations</th>
<th>Not using 3G services due to no need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>19261.000</td>
<td>18050.000</td>
<td>14324.000</td>
<td>19726.500</td>
<td>17776.500</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>30737.000</td>
<td>56000.000</td>
<td>52274.000</td>
<td>31202.500</td>
<td>29252.500</td>
</tr>
<tr>
<td>Z</td>
<td>-1.288</td>
<td>-2.321</td>
<td>-5.534</td>
<td>-.929</td>
<td>-2.542</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.198</td>
<td>.020</td>
<td>.000</td>
<td>.353</td>
<td>.011</td>
</tr>
</tbody>
</table>

Grouping variable: Annual Income

The table 3.7.36 shows the descriptive statistics of the variables ‘Lack of network coverage of 3G mobile internet services’, ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ pertaining to two income groups of respondents: (i) annual income up to 2 lakhs and (ii) annual income more than 2 lakhs.

Table 3.7.36
Descriptive statistics of factors affecting adoption of 3G mobile internet services with respect to the income of the respondents

<table>
<thead>
<tr>
<th>Details</th>
<th>N</th>
<th>Lack of 3G network coverage*</th>
<th>High pricing of 3G services*</th>
<th>High cost of 3G mobile handsets*</th>
<th>Difficulty to learn the method of operation of 3G handsets*</th>
<th>The 3G services are not essential*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Up to 2 lakhs</td>
<td>151</td>
<td>3.26</td>
<td>3.54</td>
<td>1.018</td>
<td>3.68</td>
<td>.926</td>
</tr>
<tr>
<td>More than 2 lakhs</td>
<td>275</td>
<td>3.40</td>
<td>3.31</td>
<td>1.016</td>
<td>3.13</td>
<td>1.032</td>
</tr>
<tr>
<td>Total</td>
<td>426</td>
<td>3.35</td>
<td>1.004</td>
<td>3.39</td>
<td>1.021</td>
<td>3.33</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.
The summary of Mann-Whitney U test statistics shown in table 3.7.35 indicates that the significance value is less than 0.05 for the variables ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, and ‘The services are not essential for the customer’. Therefore, it can be concluded that these variables significantly differ between two income groups of respondents: (i) annual income up to 2 lakhs and (ii) annual income more than 2 lakhs.

As the significance value is more than 0.05 for the variable ‘Lack of network coverage of 3G mobile services’ and ‘Difficulty to learn the method of operation of 3G handsets’, these variables do not significantly differ between the two income groups.

The value of mean ranking shown in table 3.7.34 and descriptive statistics shown in table 3.7.36 indicate that the major 3G adoption issues of low income group are high cost of 3G mobile handsets and high pricing of 3G services followed by the lack of 3G network coverage and unrecognised needs. The major 3G adoption issues of high income group are unrecognised needs and lack of 3G network coverage followed by high pricing of 3G services.

**Adoption issues of 3G mobile internet services: combined effect of demographic variables**

The testing of hypothesis 5.7 proved that the variables related to the adoption issues of 3G mobile internet services ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ significantly differ between two age groups: (i) age up to 30 years and (ii) age above 30 years. The variable ‘Lack of network coverage of 3G mobile services’ doesn’t significantly differ between the two age groups. It is also proved that all the above mentioned variables do not significantly differ between two the groups based on their educational profile: (i) educational profile - graduation and above and (ii) educational profile - below graduation.

The variables ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, and ‘The services are not essential for the customer’ significantly differ between two income groups: (i) annual income up to 2 lakhs and
(ii) annual income more than 2 lakhs. But the variables ‘Lack of network coverage of 3G mobile services’ and ‘Difficulty to learn the method of operation of 3G handsets’ do not significantly differ between the two income groups.

Therefore a two way table is constructed with the variables ‘High pricing of 3G mobile internet services’, ‘High cost of 3G mobile handsets’, ‘Difficulty to learn the method of operation of 3G handsets’ and ‘The services are not essential for the customer’ to study the combined effect of demographic variables age and income of the respondents in the adoption issues of 3G mobile internet services. The results are presented in table 3.7.37.

Table 3.7.37

The combined effect of age and income of the sample respondents in the adoption issues of 3G mobile internet services

<table>
<thead>
<tr>
<th>Adoption issues of 3G mobile internet services*</th>
<th>Annual income up to 2 lakhs</th>
<th>Annual income more than 2 lakhs.</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>High pricing of 3G services</td>
<td>3.63</td>
<td>0.992</td>
<td>3.57</td>
</tr>
<tr>
<td>High cost of 3G mobile handsets</td>
<td>3.73</td>
<td>0.929</td>
<td>3.23</td>
</tr>
<tr>
<td>Difficulty to learn the method of operation of 3G handsets</td>
<td>2.31</td>
<td>0.734</td>
<td>2.13</td>
</tr>
<tr>
<td>The 3G services are not essential</td>
<td>3.08</td>
<td>1.187</td>
<td>3.09</td>
</tr>
<tr>
<td>High pricing of 3G services</td>
<td>3.11</td>
<td>1.05</td>
<td>3.08</td>
</tr>
<tr>
<td>High cost of 3G mobile handsets</td>
<td>3.44</td>
<td>0.892</td>
<td>3.05</td>
</tr>
<tr>
<td>Difficulty to learn the method of operation of 3G handsets</td>
<td>2.63</td>
<td>0.792</td>
<td>2.71</td>
</tr>
<tr>
<td>The 3G services are not essential</td>
<td>3.7</td>
<td>1.068</td>
<td>3.83</td>
</tr>
</tbody>
</table>

N (age up to 30 years and annual income up to 2 lakhs)=124
N (age up to 30 years and annual income more than 2 lakhs)=129
N (age above 30 years and annual income up to 2 lakhs)=27
N (age above 30 years and annual income more than 2 lakhs)=146

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The descriptive statistics shown in table 3.7.37 indicate that the major 3G adoption issues of youngsters are high cost of 3G mobile handsets and high pricing.
of 3G services. The issues are more prominent among youngsters belonging to low income group. Leaning difficulty is not at all an issue among youngsters irrespective of their income status. The elders in general perceive that 3G mobile services are not essential for them. The income level has not significant influence on this perception of this segment. The high cost of 3G mobile handsets is a restricting factor to the adoption of 3G service among the elders of low income group.

3.8 Analysis of demographic profile of sample respondents and preference for a particular mobile telecom service provider

The Chi-Square test is used for testing the relatedness or independence of demographic variables specifically age, gender, educational qualification, employment status, income, and locality of sample respondents and preference for a particular mobile telecom service provider.

3.8.1 Age of respondents and preference for a particular mobile telecom service provider

Hypothesis 6.1

**Ho:** The age of the respondents and preference for a particular mobile telecom service provider are independent of each other.

**Ha:** There is significant relationship between the age of the respondents and preference for a particular mobile telecom service provider.

**Testing of hypothesis: The Chi-Square test**

The Chi-Square test is used for testing the relatedness or independence of age group of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of age group of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.1 and results of Chi-Square tests are presented in table 3.8.2.
Table 3.8.1
Cross tabulation - age and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Age group</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td>Less than 20 years</td>
<td>Count</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>20.3</td>
<td>19.6</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>32.8%</td>
<td>16.4%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>8.3%</td>
<td>4.3%</td>
</tr>
<tr>
<td>20 years to 30 years</td>
<td>Count</td>
<td>106</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>102.6</td>
<td>99.1</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>31.4%</td>
<td>23.1%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>40.2%</td>
<td>30.6%</td>
</tr>
<tr>
<td>30 years to 40 years</td>
<td>Count</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>70.1</td>
<td>67.7</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>26.4%</td>
<td>27.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>23.1%</td>
<td>24.7%</td>
</tr>
<tr>
<td>40 years to 50 years</td>
<td>Count</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>38.1%</td>
<td>38.1%</td>
</tr>
<tr>
<td>More than 50 years</td>
<td>Count</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>20.0</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>16.7%</td>
<td>59.1%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>4.2%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>264</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>264.0</td>
<td>255.0</td>
</tr>
<tr>
<td></td>
<td>% within Age</td>
<td>30.3%</td>
<td>29.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 3.8.2
Age and most preferred mobile service provider: Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>78.736</td>
<td>12</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>79.097</td>
<td>12</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>5.250</td>
<td>1</td>
<td>.022</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.26.

Pearson Chi-Square has a value of 78.736 with a significance of 0.000. This significance value is well below the alpha level of 0.05 and is therefore significant. Hence the null hypothesis is rejected and the alternate hypothesis is accepted that, there is significant relationship between the age of the respondents and preference for a particular mobile telecom service provider, $χ^2 (12, N=870) = 78.736, p<0.05$.

The age group of the respondents is segmented in six categories. They are the respondents in age group less than 20 years, 20 years to 30 years, 30 years to 40 years, 40 years to 50 years, 50 years to 60 years and more than 60 years. To do the Chi-Square tests for analysing the relatedness or independence between age of the respondents and preference for a particular mobile telecom service provider, the respondents belonging to the age group more than 60 years is combined with respondents belonging to the age group of 50 years to sixty years and named it as age group more than fifty years. This is due to the reason that one cell, the cell corresponding to the respondents of ‘Mobile Service Provider Airtel’ and ‘Age group more than 60 years’ has expected count less than 5, violating the main assumption of chi-square tests.

In examining the cell frequencies following observations and conclusions can be arrived.

1. The respondents belonging to the younger generation; the age group below 30 years prefer private sector mobile service providers to BSNL. From among the sample respondents, it can be seen that 48.5% of Idea customers, 51.6% of Vodafone customers and 57.4% of Airtel customers belonging to
the age group below 30 years. The BSNL representation in this category of age is only 34.9%. The marketing strategies of BSNL to attract younger segment may not be as effective as private sector telecom service providers. The total count of the age group below 30 years in the sample population is 405. Out of this 31.6% are Idea, 21.98% are BSNL, 29.14 are Vodafone, and 17.28% are Airtel customers.

2. The respondents belonging to the age group of 30 years to 40 years don’t show much variation in their preference for a particular mobile service provider. However, this category gives slightly more preference for Vodafone and Airtel than BSNL and Idea. From among the sample respondents, it can be seen that 31% of Vodafone customers, 29.5% of Airtel customers, 24.7% of BSNL customers, and 23.1% of Idea customers belonging to the age group of 30 years to 40 years. The total count of the age group ‘30 years to 40 years’ in the sample population is 231. Out of this 26.4% are Idea, 27.3% are BSNL, 30.7% are Vodafone, and 15.6% are Airtel customers.

3. The respondents belonging to the age group above forty years show clear inclination towards BSNL. It can be observed that, 28.4% of Idea customers, 17.5% of Vodafone customers, and 13.2% of Airtel customers belonging to this age group while BSNL representation is 40.4%. The total count of the age group above 40 years in the sample population is 234. Out of this 32.05% are Idea, 44.02% are BSNL, 17.09% are Vodafone, and 6.84% are Airtel customers.

3.8.2 The gender of sample respondents and preference for a particular mobile telecom service provider

Hypothesis 6.2

H₀: The gender of the respondents and preference for a particular mobile telecom service provider are independent of each other.

Hₐ: There is significant relationship between the gender of the respondents and preference for a particular mobile telecom service provider.
Testing of hypothesis: The Chi-Square test

The Chi-Square test is used for testing the relatedness or independence of gender of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of gender of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.3 and results of Chi-Square tests are presented in table 3.8.4.

Table 3.8.3
Cross tabulation - gender and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Gender</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td>Male</td>
<td>Count</td>
<td>171</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>161.1</td>
<td>155.6</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>64.8%</td>
<td>57.3%</td>
</tr>
<tr>
<td>Female</td>
<td>Count</td>
<td>93</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>102.9</td>
<td>99.4</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>35.2%</td>
<td>42.7%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>264</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>264.0</td>
<td>255.0</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 3.8.4
Gender and most preferred mobile service provider: Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>4.098</td>
<td>3</td>
<td>.251</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>4.097</td>
<td>3</td>
<td>.251</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.957</td>
<td>1</td>
<td>.328</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 47.54.
The Pearson Chi-Square has a value of 4.098 with a significance of 0.251. This significance value is much higher than the commonly accepted alpha level of 0.05. Therefore the null hypothesis is accepted and it can be concluded that there is no significant relationship between the gender of the respondents and preference for a particular mobile telecom service provider, $\chi^2 (3, N=870) = 4.098, p>0.05$.

3.8.3 The educational qualification of sample respondents and preference for a particular mobile telecom service provider

Hypothesis 6.3

**Ho:** The educational qualification of the respondents and preference for a particular mobile telecom service provider are independent of each other.

**Ha:** There is significant relationship between the educational qualification of the respondents and preference for a particular mobile telecom service provider.

**Testing of hypothesis: The Chi-Square test**

The Chi-Square test is used for testing the relatedness or independence of educational qualification of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of educational qualification of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.5 and results of Chi-Square tests are presented in table 3.8.6.
### Table 3.8.5
Cross tabulation - educational qualification and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Details</th>
<th>Mobile Service Providers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>39</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>25.5</td>
<td>24.6</td>
</tr>
<tr>
<td></td>
<td>% within Educational Qualification</td>
<td>46.4%</td>
<td>14.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider</td>
<td>14.8%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Below 10th standard</td>
<td>Count</td>
<td>83</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>73.4</td>
<td>70.9</td>
</tr>
<tr>
<td></td>
<td>% within Educational Qualification</td>
<td>34.3%</td>
<td>22.7%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider</td>
<td>31.4%</td>
<td>21.6%</td>
</tr>
<tr>
<td>10th standard pass - Below graduation</td>
<td>Count</td>
<td>69</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>80.1</td>
<td>77.4</td>
</tr>
<tr>
<td></td>
<td>% within Educational Qualification</td>
<td>26.1%</td>
<td>36.7%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider</td>
<td>26.1%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Graduation and Above</td>
<td>Count</td>
<td>73</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>85.0</td>
<td>82.1</td>
</tr>
<tr>
<td></td>
<td>% within Educational Qualification</td>
<td>26.1%</td>
<td>32.5%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider</td>
<td>27.7%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Professional / Technical Degree</td>
<td>Count</td>
<td>264</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>264.0</td>
<td>255.0</td>
</tr>
<tr>
<td></td>
<td>% within Educational Qualification</td>
<td>30.3%</td>
<td>29.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 3.8.6

Educational qualification and most preferred mobile service provider: Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>48.026a</td>
<td>9</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>49.769</td>
<td>9</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>7.899</td>
<td>1</td>
<td>.005</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.78.

The Pearson Chi-Square has a value of 48.026 with a significance of 0.000. This significance value is well below the alpha level of 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted that, there is significant relationship between the educational qualification of the respondents and preference for a particular mobile telecom service provider, \( \chi^2 \ (9, \ N=870) =48.026, p<0.05. \)

The educational qualification of the respondents is segmented in four categories. They are the respondents with educational qualification below 10th standard, 10th standard pass- below graduation, graduation and above, and professional/technical degree.

In examining the cell frequencies following observations and conclusions can be arrived.

1. The respondents with the educational qualification below 10th standard show a strong preference for Idea and Vodafone than BSNL and Airtel. From among the sample respondents, it can be observed that, 14.8% of Idea customers, 12.7% of Vodafone customers, 4.7% of BSNL customers and 3.3% of Airtel customers belonging to this category. The total count of respondents with the educational qualification below 10th standard in the sample population is 84. Out of this 46.4% are Idea, 34.5% are Vodafone and 14.3% are BSNL and 4.8% are Airtel customers.
2. The respondents with the educational qualification above 10th standard but below graduation show strong preference for Vodafone and Idea than BSNL and Airtel. From among the sample respondents, it can be observed that 34.1% of Vodafone customers, 31.4% of Idea customers, 21.6% of BSNL customers and 21.3% of Airtel customers belonging to this category. The total count of respondents with the educational qualification above 10th standard but below graduation in the sample population is 242. Out of this 34.3% are Idea, 32.2% are Vodafone and 22.7% are BSNL and 10.7% are Airtel customers.

3. The respondents with the educational qualification above graduation show relatively more preference for BSNL and Airtel than Idea and Vodafone. From among the sample respondents, it can be observed that 38% of BSNL customers, 32% of Airtel customers, 26.1% of Idea customers and 25.8% of Vodafone customers belonging to this category. The total count of respondents with the educational qualification above graduation in the sample population is 264. Out of this 36.7% are BSNL, 26.1% are Idea, 22.3% are Vodafone and 14.8% are Airtel customers.

4. The respondents with the educational qualification as professional or technical degree show relatively more preference for Airtel and BSNL than Idea and Vodafone. From among the sample respondents, it can be observed that 43.4% of Airtel customers 35.7% of BSNL customers, 27.7% of Idea customers and 27.5% of Vodafone customers belonging to this category. The total count of respondents with the educational qualification as professional or technical degree in the sample population is 280. Out of this 32.5% are BSNL, 26.1% are Idea, 22.5% are Vodafone and 18.9% are Airtel customers.

In general the respondents belonging to segment of educationally low profile show more preference for the mobile telecom service providers Idea or Vodafone and educationally high profile give more preference the mobile telecom service providers BSNL or Airtel.
3.8.4 The employment status of sample respondents and preference for a particular mobile telecom service provider

**Hypothesis 6.4**

**Ho:** The employment status of the respondents and preference for a particular mobile telecom service provider are independent of each other.

**Ha:** There is significant relationship between the employment status of the respondents and preference for a particular mobile telecom service provider.

**Testing of hypothesis: The Chi-Square test**

The Chi-Square test is used for testing the relatedness or independence of Employment Status of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of employment status of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.7 and results of Chi-Square tests are presented in table 3.8.8.

**Table 3.8.7**

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td>Government Service</td>
<td>Count</td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>34.7</td>
<td>31.2</td>
</tr>
<tr>
<td></td>
<td>% within Employment Status</td>
<td>18.8%</td>
<td>62.5%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>8.1%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Private Sector</td>
<td>Count</td>
<td>46</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>48.0</td>
<td>43.1</td>
</tr>
<tr>
<td></td>
<td>% within Employment Status</td>
<td>29.7%</td>
<td>18.7%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>17.8%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Category</td>
<td>Count</td>
<td>36</td>
<td>21</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>36</td>
<td>21</td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>31.6</td>
<td>28.4</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>35.3%</td>
<td>20.6%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>13.9%</td>
<td>9.0%</td>
</tr>
<tr>
<td><strong>Professional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>29.1</td>
<td>26.2</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>29.8%</td>
<td>26.6%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>10.8%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td><strong>Self Employed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>47</td>
<td>49</td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>53.8</td>
<td>48.4</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>40.8%</td>
<td>13.3%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>18.9%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td><strong>Student</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>24.8</td>
<td>22.3</td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>24.8</td>
<td>22.3</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>40.0%</td>
<td>28.8%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>18.1%</td>
<td>21.0%</td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>52</td>
<td>49</td>
</tr>
<tr>
<td><strong>House Wife</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>24.8</td>
<td>22.3</td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>24.8</td>
<td>22.3</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>40.0%</td>
<td>28.8%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>12.4%</td>
<td>9.9%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>259</td>
<td>233</td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Count</td>
<td></td>
<td>259.0</td>
<td>233.0</td>
</tr>
<tr>
<td>% within Employment Status</td>
<td></td>
<td>30.9%</td>
<td>27.8%</td>
</tr>
<tr>
<td>% within Mobile Service Provider - Most Preferred</td>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 3.8.8

Employment status and most preferred mobile service provider: Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>1.216E2a</td>
<td>18</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>114.720</td>
<td>18</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>1.268</td>
<td>1</td>
<td>.260</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>837</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.57.

The Pearson Chi-Square has a value of 121.6 with a significance of 0.000. This significance value is well below the alpha level of 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted that, there is significant relationship between the employment status of the respondents and preference for a particular mobile telecom service provider, $\chi^2 (18, N=837) =121.6$, p<0.05.

The employment status of the respondents is segmented in eight categories namely: Government Service, Private Sector, Business, Professional, Self-Employed, Student, Retired and Housewife.

In examining the cell frequencies following observations and conclusions can be arrived.

1. The respondents belonging to the category of government employees prefer BSNL to private sector mobile service providers. From among the sample respondents, it can be seen that 30% of BSNL customers are government employees. The representations of government employees in private sector telecom operators are comparatively very less. From among the sample respondents, 8.1% of Idea customers, 7.1% of Vodafone customers and 4.1% of Airtel are government employees. The total count of Government employees in the sample population is 112. Out of this 62.5% are BSNL, 18.8% are Idea, 14.3% are Vodafone and 4.5% are Airtel customers.
2. The respondents belonging to the category of private sector employees prefer private sector mobile service providers to BSNL. From among the sample respondents, it can be seen that 32.2% of Airtel customers, 18.3% of Vodafone customers and 17.8% of Idea customers belonging to the category of private sector employees. The BSNL representation in this category is only 12.4%. The total count of Private employees in the sample population is 155. Out of this 29.7% are Idea, 26.5% are Vodafone and 25.2% are Airtel and 18.7% are BSNL customers.

3. The respondents with employment status ‘Business’ do not show much variation in their preference for a particular mobile service provider. However this category gives slightly more preference for private sector mobile service providers than BSNL. From among the sample respondents, it can be seen that 13.9% of Idea customers, 13.4% of Vodafone customers, 12.4% of Airtel customers and 9% of BSNL customers belonging to this category. The total count of Private employees in the sample population is 155. Out of this 35.3% are Idea, 29.4% are Vodafone, 20.6% are BSNL and 14.7% are Airtel customers.

4. The professional category from the sample respondents shows approximately same preference for all the mobile service providers. From among the sample respondents, it can be seen that 10.8% of Idea customers, 10.7% of BSNL customers, 8.9% of Vodafone customers, and 17.4% of Airtel customers belonging to this category. The total count of professional people in the sample population is 94. Out of this 29.8% are Idea, 26.6% are BSNL, 21.3% are Vodafone, and 22.3% are Airtel customers.

5. The respondents belonging to the category of self-employed prefers Vodafone or Idea to BSNL or Airtel. From among the sample respondents, it can be seen that 20.1% of Vodafone customers, 18.9% of Idea customers, 8.3% of Airtel customers and 6.9% of BSNL customers belong to the category of self-employed. The total count of self-employed in the sample population is 120. Out of this 40.8% are Idea, 37.5% are Vodafone and 8.3% are Airtel and 13.3% are BSNL customers.
6. The student category from the sample respondents shows nearly same preference for all the mobile service providers. From among the sample respondents, it can be seen that 18.1% of Idea customers, 21% of BSNL customers, 23.2% of Vodafone customers, and 21.5% of Airtel customers belonging to this category. The total count of students in the sample population is 174. Out of this 27% are Idea, 28.2% are BSNL, 29.9% are Vodafone, and 14.9% are Airtel customers.

7. The Housewives from the sample respondents show relatively more preference for Idea, moderate preference for BSNL and Vodafone and lower preference for Airtel. From among the sample respondents, it can be seen that 12.4% of Idea customers, 9.9% of BSNL customers, 8.9% of Vodafone customers, and 4.1% of Airtel customers belonging to this category. The total count of housewives in the sample population is 80. Out of this 40% are Idea, 28.8% are BSNL, 25% are Vodafone, and 6.2% are Airtel customers.

The respondents belonging to the employment status “retired” has been excluded from the chi- square test due to reason that one cell, the cell corresponding to the respondents of ‘Mobile Service Provider Airtel’ and ‘Employment status retired’ has expected count less than 5, violating the main assumption of chi-square tests. However the cross tabulation of respondents with employment status “retired” and their association with different mobile service providers is given in the table 3.8.9.

**Table 3.8.9**

Cross tabulation - employment status ‘Retired’ category and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td>Retired</td>
<td>Count</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>% within Employment Status</td>
<td>15.2%</td>
<td>66.7%</td>
</tr>
</tbody>
</table>
The total count of “retired” in the sample population is 33. Out of this 66.7% are BSNL, 15.2% are Idea, 15.2% are Vodafone and 3% are Airtel customers. The respondents belonging to the retired category show high preference for the service provider BSNL.

3.8.5 The annual family income of sample respondents and preference for a particular mobile telecom service provider

Hypothesis 6.5

Ho: The annual family Income of the respondents and preference for a particular mobile telecom service provider are independent of each other.

Ha: There is significant relationship between the annual family income of the respondents and preference for a particular mobile telecom service provider

Testing of hypothesis: The Chi-Square test

The Chi-Square test is used for testing the relatedness or independence of Annual Family Income of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of annual family income of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.10 and results of Chi-Square tests are presented in table 3.8.11
Table 3.8.10
Cross tabulation - annual family income and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Annual family income</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>137</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>111.4</td>
<td>107.6</td>
</tr>
<tr>
<td>Upto Rs 2 Lakhs</td>
<td>% within Annual Family Income</td>
<td>37.3%</td>
<td>18.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>51.9%</td>
<td>26.3%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>92</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>107.4</td>
<td>103.8</td>
</tr>
<tr>
<td>Rs 2 Lakhs to Rs 5 Lakhs</td>
<td>% within Annual Family Income</td>
<td>26.0%</td>
<td>36.4%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>34.8%</td>
<td>50.6%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>34.3</td>
<td>33.1</td>
</tr>
<tr>
<td>Rs 5 Lakhs to Rs 10 Lakhs</td>
<td>% within Annual Family Income</td>
<td>22.1%</td>
<td>42.5%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>9.5%</td>
<td>18.8%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>10.9</td>
<td>10.6</td>
</tr>
<tr>
<td>More than Rs 10 Lakhs</td>
<td>% within Annual Family Income</td>
<td>27.8%</td>
<td>30.6%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>3.8%</td>
<td>4.3%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>264</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>264.0</td>
<td>255.0</td>
</tr>
<tr>
<td>Total</td>
<td>% within Annual Family Income</td>
<td>30.3%</td>
<td>29.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 3.8.11
Annual family income and most preferred mobile service provider:
Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>60.625</td>
<td>9</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>60.732</td>
<td>9</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>2.642</td>
<td>1</td>
<td>.104</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.05.

The Pearson Chi-Square has a value of 60.625 with a significance of 0.000. This significance value is well below the alpha level of 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted that, there is significant relationship between the annual family income of the respondents and preference for a particular mobile telecom service provider, $\chi^2 (9, N=870) =60.625, p<0.05.$

The annual family income of the respondents is segmented in four categories. They are the segments with annual family income up to Rupees 2 lakhs, 2lakhs to 5 lakhs, 5 lakhs to 10 lakhs and more than 10 lakhs.

In examining the cell frequencies following observations and conclusions can be arrived.

1. The respondents with annual family income up to Rupees 2 lakhs, mainly prefer private sector telecom service providers, especially Idea or Vodafone for their mobile communication needs. From among the sample respondents, it can be observed that 52.8% of Vodafone customers, 51.9% of Idea customers, 34.4% percentage of Airtel customers and 26.3% percentage of BSNL customers belonging to this segment. The total count of respondents with annual family income up to Rupees 2 lakhs in the sample population is 367. Out of this 37.3% are Idea, 33% are Vodafone, 18.3% are BSNL and 11.4% are Airtel customers.
2. The respondents with annual family income above Rupees 2 lakhs but below Rupees 5 lakhs, mainly prefer BSNL to private sector telecom service providers. A considerable population of private sector telecom operators also belonging to this segment. From among the sample respondents, 50.6% percentage of BSNL customers, 41.8% percentage of Airtel customers, 35.8% of Vodafone customers, and 34.8% of Idea customers belonging to this segment. The total count of respondents with annual family income above Rupees 2 lakhs but below Rupees 5 lakhs in the sample population is 354. Out of this 36.4% are BSNL, 26% are Idea, 23.2% are Vodafone, and 14.4% are Airtel customers.

3. The respondents with annual family income above Rupees 5 lakhs but below Rupees 10 lakhs, shows slightly more preference for BSNL as compared to other mobile telecom service providers. From among the sample respondents, 18.8% percentage of BSNL customers, 14.8% percentage of Airtel customers, 9.6% of Vodafone customers, and 9.5% of Idea customers belonging to this segment. The total count of respondents with annual family income above Rupees 5 lakhs but below Rupees 10 lakhs in the sample population is 113. Out of this 42.5% are BSNL, 22.1% are Idea, 19.5% are Vodafone, and 15.9% are Airtel customers.

4. The respondents with annual family income above Rupees 10 lakhs show slightly more preference for Airtel or BSNL than Idea or Vodafone. From among the sample respondents 9% percentage of Airtel customers, 4.3% percentage of BSNL customers, 3.8% of Idea customers and 1.7% of Vodafone customers belonging to this segment. The total count of respondents with annual family income above Rupees 10 in the sample population is 36. Out of this 30.6% are BSNL, 30.6% are Airtel, 27.8% are Idea, and 11% are Vodafone customers.

In general the respondents belonging to the segment of the low income profile give more preference for the mobile telecom service providers Idea or Vodafone and the high income profile give more preference the mobile telecom service providers BSNL or Airtel.
3.8.6 The locality of sample respondents and preference for a particular mobile telecom service provider

Hypothesis 6.6

**Ho:** The locality of the respondents and preference for a particular mobile telecom service provider are independent of each other.

**Ha:** There is significant relationship between the locality of the respondents and preference for a particular mobile telecom service provider.

Testing of hypothesis: The Chi-Square test

The Chi-Square test is used for testing the relatedness or independence of locality of sample respondents and preference for a particular mobile telecom service provider. The cross tabulation of locality of sample respondents and the most preferred mobile telecom service provider is presented in the table 3.8.12 and results of Chi-Square tests are presented in table 3.8.13.
### Table 3.8.12
Cross tabulation - locality and most preferred mobile service provider

<table>
<thead>
<tr>
<th>Locality</th>
<th>Details</th>
<th>Mobile Service Provider - most preferred</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Idea</td>
<td>BSNL</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>95</td>
<td>70</td>
</tr>
<tr>
<td>Rural</td>
<td>Expected Count</td>
<td>87.4</td>
<td>84.4</td>
</tr>
<tr>
<td></td>
<td>% within Locality</td>
<td>33.0%</td>
<td>24.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>36.0%</td>
<td>27.5%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>99</td>
<td>88</td>
</tr>
<tr>
<td>Semi Urban</td>
<td>Expected Count</td>
<td>91.3</td>
<td>88.2</td>
</tr>
<tr>
<td></td>
<td>% within Locality</td>
<td>32.9%</td>
<td>29.2%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>37.5%</td>
<td>34.5%</td>
</tr>
<tr>
<td>Urban</td>
<td>Count</td>
<td>70</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>85.3</td>
<td>82.4</td>
</tr>
<tr>
<td></td>
<td>% within Locality</td>
<td>24.9%</td>
<td>34.5%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>26.5%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>264</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>264.0</td>
<td>255.0</td>
</tr>
<tr>
<td></td>
<td>% within Locality</td>
<td>30.3%</td>
<td>29.3%</td>
</tr>
<tr>
<td></td>
<td>% within Mobile Service Provider - Most Preferred</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 3.8.13
Locality and most preferred mobile service provider: Chi-Square test results

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>22.632a</td>
<td>6</td>
<td>.001</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>22.881</td>
<td>6</td>
<td>.001</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>1.753</td>
<td>1</td>
<td>.186</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>870</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 39.40.

The Pearson Chi-Square has a value of 22.632 with a significance of 0.001. This significance value is well below the alpha level of 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted that, there is significant relationship between the locality of the respondents and preference for a particular mobile telecom service provider, \(\chi^2 (9, N=870) =22.632, p<0.05\).

The locality of the respondents is segmented in three categories. The respondents of municipal corporations are identified as urban category, the respondents of municipalities are identified as semi-urban category and the respondents of panchayat are identified as rural category.

In examining the cell frequencies following observations and conclusions can be arrived.

1. The respondents of rural segments mainly prefer private sector telecom service providers, especially Vodafone or Idea for their mobile communication needs. From among the sample respondents, it can be observed that 36.7% of Vodafone customers, 36% of Idea customers, 33.1% percentage of Airtel customers and 27.5% percentage of BSNL customers belonging to this segment. The total count of respondents of rural segments in the sample population is 288. Out of this 33% are Idea, 29.2% are Vodafone, 24.3% are BSNL and 13.5% are Airtel customers.

2. The respondents of semi urban segments show nearly same preference for Idea, Vodafone and BSNL and relatively low preference for Airtel.
among the sample respondents, it can be seen that 37.5% of Idea customers, 34.5% of BSNL customers, 37.1% of Vodafone customers, and 23.8% of Airtel customers belonging to this category. The total count of respondents of semi urban segment in the sample population is 301. Out of this 32.9% are Idea, 29.2% are BSNL, 28.2% are Vodafone, and 9.6% are Airtel customers.

3. The respondents of urban segments show more preference for Airtel or BSNL than Idea or Vodafone. From among the sample respondents 44.3% percentage of Airtel customers, 38% percentage of BSNL customers, 26.5% of Idea customers and 26.2% of Vodafone customers belonging to this segment. The total count of respondents of urban segment in the sample population is 281. Out of this 34.5% are BSNL, 24.9% are Idea, and 21.4% are Vodafone and 19.2% are Airtel customers.

3.9 Analysis of services marketing aspects of landline and landline broadband internet services

The landline industry in Kerala is facing the declining stage of the product life cycle. The landline telecom service providers in Kerala are BSNL, Airtel, Reliance, and Tata. Their subscriber base and respective market share in Kerala as on March 2013 are: BSNL (29.44 lakhs, 96.04%), Airtel (0.56 lakhs, 1.83%), Reliance (0.54 lakhs, 1.76%), and Tata (0.11 lakhs, 0.37%)\textsuperscript{20}. In total of 1080 respondents in the survey, 533 of them are landline users. The distribution of landline users of sample respondents is given in the table 3.9.1.

\textsuperscript{20} Press releases on subscriber data, March 2013. Telecom Regulatory Authority of India. www.trai.gov.in
Table 3.9.1

Distribution of landline users of sample respondents

<table>
<thead>
<tr>
<th>Landline Service Provider</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>474</td>
<td>88.9</td>
<td>88.9</td>
</tr>
<tr>
<td>Reliance</td>
<td>30</td>
<td>5.6</td>
<td>94.6</td>
</tr>
<tr>
<td>Airtel</td>
<td>12</td>
<td>2.3</td>
<td>96.8</td>
</tr>
<tr>
<td>Tata</td>
<td>17</td>
<td>3.2</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>533</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

3.9.1 Landline telecom services

The services marketing aspects of landline telephone services are studied mainly based on four variables. The variables are: the product benefits and service support, pricing attractiveness, employee attitude and product (landline) retention possibility. The items used to measure the variable the product benefits and service support are: excellent voice clarity, compliant resolution or fault repair is fast, excellent service support, modern and visually appealing telephone instrument and materials, and the services are dependable.

The pricing attractiveness is measured using five items specifically: attractive tariff plans are offered in landline services, the landline services are low-priced, the billing of landline services is transparent and there are no hidden charges, attractive discounts/ rebates are offered in landline services, landline and mobile phone combined schemes/offers are attractive.

The employee attitude is measured by two items. The items are: ‘the employees are knowledgeable and polite to the customers’ and ‘the employees of service provider do understand the needs of the customers and give personal attention to them’.

The items used to measure the variable ‘The landline retention possibility’ are: landline services deliver the real value for money spends on it, emotional attachment with the landline service, satisfaction with the landline services, and the likelihood to retain the landline services.
All items are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of the variables.

**Hypothesis 7.1**

There is significant relationship between the landline retention possibility and the service related factors specifically product benefits and service support, pricing attractiveness, and employee attitude of landline telecom services.

**Testing of hypothesis: Correlation analysis**

The correlation analysis is performed to identify the extent to which two or more things are related to one another. The correlation coefficient varies from -1.0 to +1.0. The value of -1.0 indicates a perfect negative correlation and +1.0 indicates a perfect positive correlation. A correlation coefficient zero means there is no relationship between the variables. As the distribution of the variables ‘product benefits and service support’, ‘Pricing attractiveness’, ‘Employee attitude of landline telecom services’ and ‘The landline retention possibility’ are significantly non normal, the non-parametric correlation analysis, Spearman’s rho is used is ascertain the relationship between the variables. The test results are shown in table 3.9.2.
Table 3.9.2
The results of correlation analysis: the retention possibility of landline services

<table>
<thead>
<tr>
<th>Details</th>
<th>Correlation Coefficient</th>
<th>Product benefits and service support</th>
<th>Employee attitude</th>
<th>Pricing attractiveness</th>
<th>Landline retention possibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product benefits and service support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>1.000</td>
<td></td>
<td>.669**</td>
<td>.360**</td>
<td>.626**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
</tr>
<tr>
<td><strong>Employee attitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.669**</td>
<td></td>
<td>1.000</td>
<td>.324**</td>
<td>.528**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
</tr>
<tr>
<td><strong>Pricing attractiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.360**</td>
<td></td>
<td>.324**</td>
<td>1.000</td>
<td>.567**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
</tr>
<tr>
<td><strong>Landline retention possibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient</td>
<td>.626**</td>
<td></td>
<td>.528**</td>
<td>.567**</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
<td>533</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

The test results indicate that the correlation is significant between the landline retention possibility and the service related factors specifically product benefits and service support, pricing attractiveness, and employee attitude of landline telecom services. The product benefits and service support has high positive correlation (correlation coefficient 0.626) with the landline retention possibility. The pricing attractiveness (correlation coefficient 0.567) and employee attitude (correlation coefficient 0.528) are also positively correlated with the landline retention possibility.
The descriptive statistics of landline retention possibility and service related factors specifically product benefits and service support, pricing attractiveness, and employee attitude of landline telecom service providers are shown in table 3.9.3.

Table 3.9.3
Descriptive statistics of service related factors of landline service providers

<table>
<thead>
<tr>
<th>Landline service provider</th>
<th>N</th>
<th>Product benefits and service support*</th>
<th>Employee attitude*</th>
<th>Pricing attractiveness*</th>
<th>Landline retention possibility*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>BSNL</td>
<td>474</td>
<td>3.29</td>
<td>0.888</td>
<td>3.23</td>
<td>0.944</td>
</tr>
<tr>
<td>Reliance</td>
<td>30</td>
<td>3.66</td>
<td>0.573</td>
<td>3.60</td>
<td>0.578</td>
</tr>
<tr>
<td>Airtel</td>
<td>12</td>
<td>4.42</td>
<td>0.262</td>
<td>4.29</td>
<td>0.498</td>
</tr>
<tr>
<td>Tata</td>
<td>17</td>
<td>3.79</td>
<td>0.698</td>
<td>3.79</td>
<td>0.532</td>
</tr>
<tr>
<td>Total</td>
<td>533</td>
<td>3.35</td>
<td>0.881</td>
<td>3.29</td>
<td>0.929</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The mean score and standard deviation given in the table 3.9.3 indicate that the private landline service providers especially Airtel positively differentiated their landline services with better ‘product benefits and service support’ and ‘employee attitude’ than BSNL. The pricing attractiveness is comparatively higher in Reliance and BSNL landline services than Airtel and Tata. The retention possibility is comparatively high in Airtel and BSNL, moderate in Reliance and comparatively low in Tata landline services. Even though the retention possibility is comparatively high in BSNL, the value of standard deviation implies that the retention possibility variation is very high in BSNL.

3.9.2 Landline broadband internet services

The broadband internet services supported the landline services with value addition in the declining stage of the landline industry. In total of 533 landline users among the sample respondents, 291 of them are landline broadband users. The distribution of landline broadband internet users of sample respondents is given in the table 3.9.4.
Table 3.9.4
Distribution of landline broadband internet users of sample respondents

<table>
<thead>
<tr>
<th>Landline Service Provider</th>
<th>Broadband users</th>
<th>Non Broadband users</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>268 (56.5%)</td>
<td>206 (43.5%)</td>
<td>474 (100%)</td>
</tr>
<tr>
<td>Reliance</td>
<td>5 (16.7%)</td>
<td>25 (83.3%)</td>
<td>30 (100%)</td>
</tr>
<tr>
<td>Airtel</td>
<td>10 (83.3%)</td>
<td>2 (16.7%)</td>
<td>12 (100%)</td>
</tr>
<tr>
<td>Tata</td>
<td>8 (47.1%)</td>
<td>9 (52.9%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>291 (54.6%)</strong></td>
<td><strong>242 (45.4%)</strong></td>
<td><strong>533 (100%)</strong></td>
</tr>
</tbody>
</table>

Source: Primary Survey.

The services marketing aspects of landline broadband internet services are studied mainly based on three variables. The variables are: the product benefits and service support, pricing attractiveness, and customer satisfaction. The items used to measure the variable the product benefits and service support are: uninterrupted internet connectivity, getting the download speed as assured in the broadband plan, excellent customer support, and excellent overall quality of broadband internet services.

The pricing attractiveness is measured using three items specifically: ‘Wide variety of tariff plans are offered in broadband services’, ‘Attractive discounts/rebates are offered in broadband services’ and ‘the pricing of broadband services are attractive’.

The items used to measure customer satisfaction are: ‘the landline broadband services deliver the real value for money spend on it’, ‘really satisfied with the landline broadband internet services’ and ‘would recommend the landline broadband internet services to the friends / colleagues’.

All items are measured by Likert Scale with five anchor points, specifically Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. Equal weightage is given for all items to compute the mean value of the variables.
Hypothesis 7.2

There is significant relationship between the customer satisfaction and the service related factors specifically ‘product benefits and service support’ and ‘pricing attractiveness’ of landline broadband internet services.

Testing of hypothesis: Correlation analysis

The correlation analysis is performed to identify the extent to which two or more things are related to one another. The correlation coefficient varies from -1.0 to +1.0. The value of -1.0 indicates a perfect negative correlation and +1.0 indicates a perfect positive correlation. A correlation coefficient zero means there is no relationship between the variables. As the distribution of the variables ‘Product benefits and service support’, ‘Pricing attractiveness’, and ‘Customer satisfaction’ are significantly non normal, the non-parametric correlation analysis, Spearman’s rho is used is ascertain the relationship between the variables. The test results are shown in table 3.9.5.

Table 3.9.5

The results of correlation analysis: customer satisfaction of landline broadband internet services

<table>
<thead>
<tr>
<th>Correlations - Spearman's rho</th>
<th>Details</th>
<th>Product benefits and service support</th>
<th>Pricing attractiveness</th>
<th>Customer Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Correlation Coefficient</td>
<td>.259**</td>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>N</td>
</tr>
<tr>
<td>Pricing attractiveness</td>
<td></td>
<td>Correlation Coefficient</td>
<td>.259**</td>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>N</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td></td>
<td>Correlation Coefficient</td>
<td>.618**</td>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>N</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
The test results indicate that the correlation is significant between customer satisfaction and the service related factors specifically ‘Product benefits and service support’ and ‘Pricing attractiveness’ of landline broadband internet services. The customer satisfaction has high positive correlation with product benefits and service support (correlation coefficient 0.618), and pricing attractiveness (correlation coefficient 0.610).

The product benefits and service support has high positive correlation (correlation coefficient 0.618) with the customer satisfaction. The pricing attractiveness is also positively correlated with the customer satisfaction.

The descriptive statistics of customer satisfaction and the service related factors specifically ‘Product benefits and service support’ and ‘Pricing attractiveness’ of landline broadband internet services are shown in table 3.9.6. As the number of respondents corresponding to the broadband services of the private sector providers Reliance, Airtel and Tata is less, for the purpose of descriptive statistical analysis, the respondents belonging to these providers are put together and categorized as private sector.

### Table 3.9.6

**Descriptive statistics of service related factors of landline broadband services:**

<table>
<thead>
<tr>
<th>Landline broadband internet service provider</th>
<th>N</th>
<th>Product benefits and service support*</th>
<th>Pricing attractiveness*</th>
<th>Customer Satisfaction *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
</tr>
<tr>
<td>BSNL</td>
<td>268</td>
<td>3.74</td>
<td>0.764</td>
<td>3.63</td>
</tr>
<tr>
<td>Private Sector</td>
<td>23</td>
<td>4.21</td>
<td>0.542</td>
<td>3.10</td>
</tr>
<tr>
<td>Total</td>
<td>291</td>
<td>3.78</td>
<td>0.758</td>
<td>3.59</td>
</tr>
</tbody>
</table>

* Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

The mean score and standard deviation given in the table 3.9.6 indicate that the private landline service providers positively differentiated their landline broadband internet services with better product benefits and service support than BSNL. The pricing attractiveness is comparatively higher for BSNL landlines.
broadband services than private sector providers. The customers are generally satisfied with landline broadband internet services. Even though the satisfaction level is slightly higher for BSNL the value of standard deviation implies that the variation of customer satisfaction is relatively high among the respondents of BSNL than private sector providers.

**Opinion of respondents of landline broadband services about the retention of landline services**

The opinion of respondents of landline broadband services about the retention of their landline services is ascertained through the item: ‘Broadband internet is the main factor which forced the customer to retain the landline connection’. The responses of BSNL landline broadband customers are shown in table 3.9.7 and that of private service providers are shown in table 3.9.8.

**Table 3.9.7**

Opinion of respondents of BSNL landline broadband services about the retention of their landline services

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>12</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>78</td>
<td>29.1</td>
<td>33.6</td>
</tr>
<tr>
<td>Uncertain</td>
<td>22</td>
<td>8.2</td>
<td>41.8</td>
</tr>
<tr>
<td>Agree</td>
<td>89</td>
<td>33.2</td>
<td>75.0</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>67</td>
<td>25.0</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>268</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.9.8
Opinion of respondents of private sector landline broadband services about the retention of their landline services

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>16</td>
<td>69.6</td>
<td>69.6</td>
<td>69.6</td>
</tr>
<tr>
<td>Uncertain</td>
<td>3</td>
<td>13.0</td>
<td>13.0</td>
<td>82.6</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>17.4</td>
<td>17.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

The descriptive statistics of the variable ‘broadband internet is the main factor which forced the customer to retain the landline connection’ is shown in table 3.9.9. As the number of respondents corresponding to the private sector providers Reliance, Airtel and Tata is less, for the purpose of descriptive statistical analysis, the respondents belonging to these providers are put together and presented as private sector.

Table 3.9.9
Descriptive statistics of the variable ‘Broadband internet is the main factor which forced the customer to retain the landline connection’

<table>
<thead>
<tr>
<th>Landline broadband internet service provider</th>
<th>N</th>
<th>Broadband internet is the main factor which forced the customer to retain the landline connection*</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNL</td>
<td>268</td>
<td>3.45</td>
</tr>
<tr>
<td>Private Sector</td>
<td>23</td>
<td>2.48</td>
</tr>
<tr>
<td>Total</td>
<td>291</td>
<td>3.37</td>
</tr>
</tbody>
</table>

*Measured on a 5-point Likert Scale, Strongly Disagree =1, Disagree=2, Uncertain=3, Agree=4, Strongly Agree=5; Mean Value of the Scale = 3.

It can be observed that nearly 60% of respondents of BSNL landline broadband services retained their landline services only for availing broadband internet connectivity; whereas in private sector the corresponding proportion is 17%
only. The majority of the respondents of private sector landline broadband services find the utility of landline services along with broadband internet services.

Based on the analysis of data, it is established that the marketing strategies practiced by BNSL and the private sector telecom service providers in Kerala are significantly different. The analysis revealed that the significant predictors of customer satisfaction of mobile telecom services are service benefits, customer support services, quality of service, competitive pricing, and unethical practices. The analysis indicates that there is significant association between the landline retention possibility and the service related factors specifically product benefits and service support, pricing attractiveness, and employee attitude of landline telecom services. On the basis of the analysis, the findings of the study are presented in the following chapter.