BIA652D Multivariate Data Analysis

Two Sample T-Test, ANOVA and Regression tests with customer satisfaction and likelihood of recommendation as dependent variables and distribution system as independent variable

GROUP4 Homework 3

2016

# **Summary of Two Sample T-Test, ANOVA and Regression test results**

For this set of tests, the variables examined are customer satisfaction (X19) and likelihood of recommendation (X20). The focus is on testing whether there is a difference in customer satisfaction or likelihood of recommendation across the two distribution systems (direct and broker). As the independent variable in this case (X5 – distribution system) has only two values, direct and broker, a two sample T-Test was also used here along with ANOVA to compare the means of the two populations for each of the dependent variables. The two populations are customers sold through direct distribution system versus those sold through broker distribution system. The sample size analyzed is 100 for each of the dependent variables.

For customer satisfaction (X19) the T-Test result for Equality of Variances gives p-value of 0.5531. At 0.05 level of significance the null hypothesis of equal variance stands. This means that customer satisfaction has equal variance across both distribution channels. Furthermore, test result for significant difference between the customer satisfaction means across the two distribution channels gives p-value less than 0.0001. This means that the null hypothesis of customer satisfaction means being equal for both the distribution channels can be rejected. ANOVA test which treats distribution system as a factor with two levels, broker and direct, tests for difference in customer satisfaction means for both levels and leads to the same conclusion as the T-Test. The p-value given by ANOVA is less than 0.0001. At 0.05 level of significance we can conclude that there is a difference in means of customer satisfaction across the two distribution systems. The regression test gives p-value less than 0.0001 from which it can be concluded that there is a significant relationship between customer satisfaction and distribution system at 0.05 level of significance (the null hypothesis of slope of regression line being zero meaning no relationship can be rejected).

For likelihood of recommendation (X20), the T-Test result for Equality of Variances gives p-value of 0.9247. At 0.05 level of significance the null hypothesis of equal variance stands. This means that likelihood of recommendation has equal variance across both distribution channels. The test result for difference between the means of likelihood of recommendation across the two distribution channels gives p-value less than 0.0001. This means that the null hypothesis of the means of likelihood of recommendation being equal for both the distribution channels can be rejected. ANOVA test for difference in likelihood of recommendation means for both levels leads to the same conclusion as the T-Test. The p-value given by ANOVA is less than 0.0001. At 0.05 level of significance we can conclude that there is a difference in means of likelihood of recommendation across the two distribution systems. The regression test gives p-value less than 0.0001 from which it can be concluded that there is a significant relationship between likelihood of recommendation and distribution system at 0.05 level of significance (the null hypothesis of slope of regression line being zero meaning no relationship can be rejected).

Thus all three tests, T-Test, ANOVA, Regression, provide statistical evidence that distribution system has an effect on customer satisfaction and likelihood of recommendation.