Date: 12/14/2017

To: Dr. Dawit Zerom

From: Sanchit Singh

Subject: Severance Pay

Laurier Company recently overtook the Western Company and as a part of buyout agreement, they offered severance pay (SP) to laid-off Western company employees equivalent to the Laurier laid off employees. Bill Smith, a Western employee for the past 10 years, is in a dilemma that he was paid less during his lay-off than that offered to the laid-off Laurier’s employees. For this purpose, a statistician was called and a random sample of 50 Laurier ex-employees was taken. Also, he was informed that a severance is determined by the length of service with the company. Table 1 shows the most relevant regression analysis.

Furthermore, to determine if there is a significant relationship, critical value (CV) approach and p-value approach are used to test the hypothesis. The Null and Alternative research hypothesis are H0: b1=0 and Ha: b1≠0 respectively (b1=the slope). The CV approach checks whether the test-statistic(t-stat) value (here 10.34) of the dependent variable is greater than CV value (here 1.68). The p-value approach checks whether the p-value (here nearly 0) of the dependent variable is smaller than the probability (here 0.05). Since the results of both the approaches are TRUE, we can reject the null hypothesis (H0: b1=0). Hence, there is a relationship between the two variables.

Moreover, the value of R Square in the summary statistics explains that over 69% of the variability in the SP can be explained with the help of the relationship between the weeks SP and the number of years in the company. Apparently, the difference between Upper 95% (0.686) and Lower 95% (0.463) is 0.223 which showcases a narrow confidence interval, implies that our accuracy is higher. Furthermore, the scatter plot resembles a linear relationship between both the variables.

Lastly, to be certain of the relationship between the two variables, we use F-test. Again, we formulate Null and Alternative hypothesis and check if we have enough evidence to reject Null hypothesis. From the summary statistics, the test uses the value of Significance F (here nearly 0) and check whether it is less than the probability (here 0.05). Since the result exhibit that the value of Significance F is smaller, we can reject Null hypothesis. Hence, there is a relationship between the two variables.

To summarize, the above statistical analysis shows that there is a relationship between the ‘Number of weeks of severance pay’ and the ‘Number of years with the company.’ A 5 weeks’ severance package given to Bill is very less as compared to his 10 years tenure. Per prediction interval, we can say with 95% confidence that the distribution of values can be within 5.47 and 13.26 weeks SP. Also, with same confidence, we can say that he should get 9.36 weeks of SP, but it can range between 8.79 and 9.94 weeks SP. Hence, we conclude that Bill is not delivered a generous package in accordance to its 10 years tenure in the company and should be paid more.

**Table 1: Summary statistics for Number of weeks of severance pay according to their Number of years with the company**







|  |  |  |
| --- | --- | --- |
| **Point Estimate (Predicted Value)** | 9.36 |  |
|  | Lower | Upper |
| **Prediction Interval** | 5.47 | 13.26 |
| **Confidence Interval** | 8.79 | 9.94 |