Law Firm Absenteeism Report

Project Summary

A Director at a hypothetical small Zimbabwean law firm is concerned about employee absenteeism among staff. She believes that organisation commitment is probably the most significant contributing factor. She selected a random sample of 31 employee files and noted their level of absenteeism (in days p.a.). She sent a confidential questionnaire to each of the selected employees from which an organisation commitment index was derived. The Director is interested in the possible effect that other factors such as job tenure (time in months at the organisation), and grade (1 = clerk, 2 = consultant, 3 = lawyer) have on the level of employee absenteeism. Multiple linear regression of the data with commitment, job tenure and grade as independent variables is used to help the Director understand factors, if any, that are contributing to employees' absenteeism. NB: For the variable grade, two dummy variables were used.

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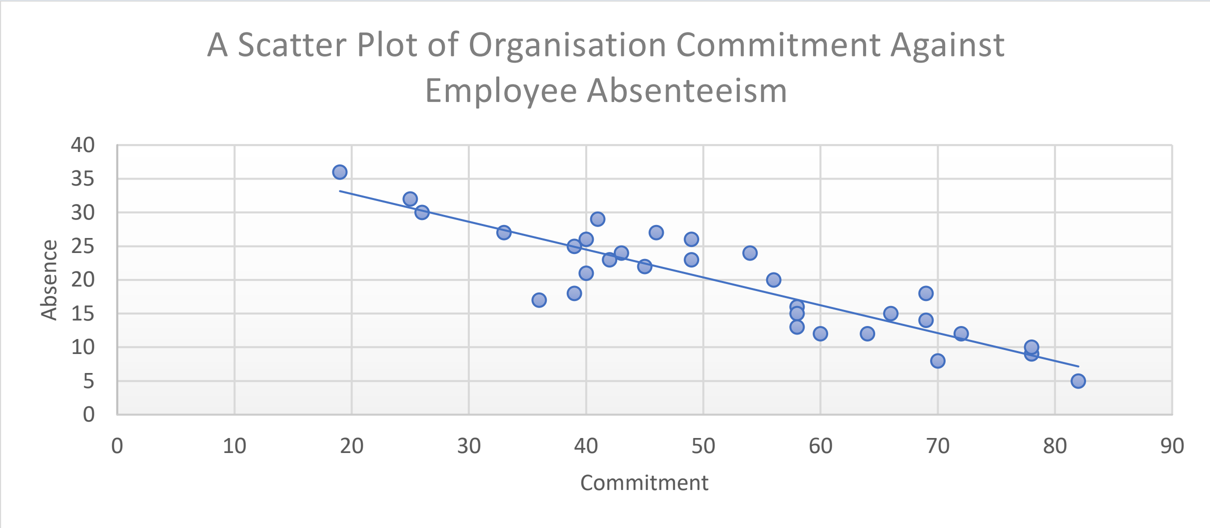
Scatter Plot: Understanding The Relationship Between Absence And Commitment



According to the scatter plot above, as the level of absenteeism increases, the level of commitment decreases. This shows that absenteeism and commitment have a strong linear relationship and have a negative linear relationship to one another, as commitment increases, the absenteeism reduces. In addition, the data points come to forming somewhat of a downwards diagonal line along the negative gradient line when plotted, proving that there is a correlation between the two variables. There are no visible outliers.

Multiple Linear Regression

NB: Number of dummy variables to be used = 3 grade variables – 1 = 2 dummy variables

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.921717989							
R Square	0.849564052							
Adjusted R Square	0.82642006							
Standard Error	3.206599193							
Observations	31							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	1509.757536	377.4393841	36.70775776	2.43419E-10			
Residual	26	267.339238	10.28227838					
Total	30	1777.096774						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	31.09776651	4.416903087	7.040626859	1.77874E-07	22.01869218	40.17684083	22.01869218	40.17684083
Commitment	-0.338901279	0.07005078	-4.837937244	5.15455E-05	-0.48289272	-0.194909838	-0.48289272	-0.194909838
Tenure	0.046154362	0.018181917	2.538476072	0.017463351	0.008780896	0.083527829	0.008780896	0.083527829
Clerk	1.213946685	2.420448631	0.501537884	0.620213067	-3.761356731	6.189250101	-3.761356731	6.189250101
Consultant	1.867526359	1.679827449	1.111737018	0.276426005	-1.585408415	5.320461134	-1.585408415	5.320461134

H_0: $\beta_i = 0$

H_1: $\beta_i \neq 0$

Rejection criteria is as follows: Reject H_0 if $|T_{cal}| > T_{\alpha/2}$ (n-k)

Commitment

- Let i= 1 = Commitment

$T_{\alpha/2}(31– 4 =27, 0.025) = 2.05$

$T_{cal} = -4.837937244$

In this case, with commitment, the $|T_{cal}| = -4.837937244 > T_{\alpha/2}(27, 0.025) = 2.05$, therefore we reject H_0 and conclude that the coefficient β_1 is not significantly different from zero at 5%. The implication is that commitment has no influence on absenteeism.

Tenure

- Let i= 2 = tenure

$T_{\alpha/2}(27) = 2.05$

$T_{cal} = 2.538476072$

In this case, with job tenure, the $|T_{cal}| = 2.538476072 > T_{\alpha/2}(27, 0.025) = 2.05$, therefore we reject H_0 and conclude that the coefficient β_2 is not significantly different from zero at 5%. The implication is that job tenure has no influence on absenteeism.

Clerk Level

- Let i= 3 = Clerk

$T_{\alpha/2}(27) = 2.05$

$T_{cal} = 0.501537884$

In this case, with lecturer level, the $|T_{cal}| = 0.501537884 < T_{\alpha/2}(27, 0.025) = 2.05$, therefore we fail to reject H_0 and conclude that the coefficient β_3 is significantly different from zero at 5%. The implication is that clerk level has significant influence on absenteeism.

Consultant Level

- Let i= 4 = Consultant

$T_{\alpha/2}(27) = 2.05$

$T_{cal} = 1.111737018$

In this case, with senior lecturer level, the $|T_{cal}| = 0. 1.111737018 < T_{\alpha/2}(27, 0.025) = 2.05$, therefore we fail to reject H_0 and conclude that the coefficient β_4 is significantly different from zero at 5%. The implication is that consultant level has significant influence on absenteeism.

Significance of the Regression Model at 0.05 Level of Significance

$$Y = B_0 + B_1X_1 B_2X_2 + B_3X_3$$

$$H_0: \beta_1 = \beta_2 = \beta_3 = \dots \beta_k = 0$$

H_1: Not all slope coefficients are simultaneously zero.

For a given level of significance $\alpha = 0.05$, numerator degrees of freedom $k - 1$ and denominator degrees of freedom $n - k$, the critical value is given by $F(k - 1, n - k)_\alpha$. Therefore, we will use $F(4,26)_{\alpha = 0.05} = 2.7426$. F_{cal} from the ANOVA table is 36.70775776

Since $F_{cal} = 36.70775776 > F(4,26)_{0.05} = 2.7426$, we reject H_0 and conclude that not all slope coefficients are simultaneously zero. Hence there is a significant relationship between the variables in the linear regression model of the data set.

Prediction And Forecasting

Absence = 1.214Clerk + 1.868Consulatant + 0.04615Tenure -0.3389 Commitment + 31.098

a) Absence for Clerk

Absence = 1.214(1) + 1.868(0) + 0.04615(10 x12) + -0.3389 (50) + 31.098

Absence = 20.90517271

b) Absence for Consultant

Absence = 1.214(0) + 1.868(1) + 0.04615(10 x12) + -0.3389 (50) + 31.098

Absence = 21.55875238

c) Absence for Lawyer

Absence = 1.214(0) + 1.868(0) + 0.04615(10 x12) + -0.3389 (50) + 31.098

Absence = 19.69122602