

Variability of a price of commodity (oil, coffee, gold, etc)

[Literature](#), [Russian Literature](#)



Macro and Micro-economics The data used in this paper has four variables (one dependent and three independent variables). Sales is the dependent variable whereas Television advertising, Newspaper advertising and the level of competitor's advertising are independent variables. Moreover, the data considers monthly sales of the Price Chopper Supermarket for the last four years (from January 2011 to December 2014). This amounts to 48 observations.

Theoretically, it has been proven that the level of advertising of any business or organization affects the entire sales in a manner that when the level of advertising is high, an organization is most likely to register high sales. On the contrary, when the advertising level goes down, the sales also go down as a result. Additionally, the level of competitors' advertising has a negative effect on sales of an organization (Trehan, & Trehan, 35).

To map the relationship between the dependent and predictor variables, we consider a number of regression models as shown below:

Model 1: Sales as a function of Newspaper Advertising

This model can be summarized follows:

Sales = 3415870 + 4.155626 Paper Advertising.

It has a coefficient of determination, $R^2 = 0.203654$, model ANOVA

Significance F = 0.001285 and the t-test p-values, $p = 6.47E-21$ and $p = 0.001285$ for the intercept and Newspaper variable respectively.

Model 2: Sales as a function of TV Advertising

This model can be summarized as follows:

Sales = 3416162 + 3.366947 TV Advertising.

It has a coefficient of determination, $R^2 = 0.360276$, model ANOVA

Significance F = 6. 5E06 and t-test p-values, $p= 2. 77E-24$ and $p= 6. 5E06$ for the intercept and Newspaper variable respectively.

Model 3: Sales as a function of Competitors' Advertising

This model can be summarized as follows:

Sales = 5452750 - 834764 TV Advertising.

It has a coefficient of determination, $R^2 = 0. 222313$, model ANOVA

Significance F = 0. 000717 and t-test p-values, $p= 4. 46E-15$ and $p= 0. 000717$ for the intercept and Newspaper variable respectively.

Model 4: Sales as a function of TV Advertising, Newspaper Advertising and Competitors' Advertising

This model can be summarized as follows:

Sales = 3476676 + 5. 096317 Newspaper + 3. 950266 TV - 334264 Competitors'

The model has a coefficient of determination, $R^2 = 0. 761468$ and ANOVA sig-F = 9. 57E-14. The t-test p-values, $p= 5. 5E-13$, $p= 2. 64E-08$, $p= 1. 4E-11$ and $p= 0. 023479$ for intercept, Newspaper, TV and Competitors advertising respectively.

Looking at the four models above, model 4 has the highest coefficient of determination, $R^2 = 0. 761468$, followed by model 2, $R^2 = 0. 360276$, model 3, $R^2 = 0. 222313$ and model 1, $R^2 = 0. 203654$. R^2 explains the proportion of the dependent variable which is explained by the independent variable(s). Therefore, in model 4, 76. 1468% of sales is explained by Newspaper, TV and Competitor's Advertising (Wang, & Jain, 13).

Forecasting

We consider model 4 since it well explains the dependent variable. Thus, the

forecast for January 2015 will be:

$$\text{Sales} = 3476676 + (5.096317 * 71881) + (3.950266 * 138134) - (334264 * 3) = 3385878$$

Thus, the sales for January 2015 are expected to be \$3385878.

In conclusion, all the models depict some significance in explaining the sales.

This implies that all the independent variables in the data are reliable when it comes to estimation of the dependent variable. However, variation in reliability of the models is differentiated by the coefficient of determination despite the fact that the t-test p-values in all models showed significance (p