

- Using data covering May 1998 to October 2000, a graduate student attempted to estimate the demand for meals at a local restaurant. The data included the average price per meal (p), the number of customers (q), and advertising expenditures (a). The following model in levels and logs was estimated:

$$Q = b_0 + b_1p + b_2a + b_3s + b_4T$$

The s variable measures seasonality, but requires some explanation in this application. The town the restaurant is in is small, but enjoys big crowds during sporting events held at the local university. The university also does not have many summer programs so student population is very small during the summer months. For these reasons, the grad student set the season variable equal to one during the regular school months and zero in the summer months and December – the times when there are few students in the town. The trend variable (T) captures any time trend and takes the value one for the first month of the data, two for second, and so on. The regression results are as follows:

Dependent Variable: Number of Customers – Levels

F-ratio = 19.354 $R^2 = .7559$

Variable	Estimate	Standard Error	t-ratio
Intercept	8790.42	1716.78	5.12
Price (p)	-505.92	168.45	-3.00
Advertising (a)	.824	.593	1.39
Season (s)	966.142	178.37	5.41
Trend (T)	25.86	11.07	2.335

Dependent Variable: Number of Customers – LOGS

F-ratio = 23.994 $R^2 = .7993$

Variable	Estimate	Standard Error	t-ratio
Intercept	10.018	0.823	12.177
Ln Price	-0.995	0.316	-3.15
Ln Advertising	0.097	0.062	1.575
Season (s)	0.199	0.032	6.212
Trend (T)	0.005	0.002	2.539

Means of Variables: Customers = 5026.73, Price = \$10.42 and Ads = \$602.20

- What is the price elasticity of demand?
- Is the restaurant's advertising program effective?
- If you were the manager of the restaurant, would you change the advertising budget?

- d. Is the business in this restaurant stable over time?
- e. Is business slower during the months when students are gone from the area?