

CONSULTING PROJECT
Estimation and Analysis of Demand for Fast Food Meals

You work for PriceWatermanCoopers as a market analyst. PWC has been hired by the owner of two Burger King restaurants located in a suburban Atlanta market area to study the demand for its basic hamburger meal package—referred to as “Combination 1” on its menus. The two restaurants face competition in the Atlanta suburb from five other hamburger restaurants (three MacDonald’s and two Wendy’s restaurants) and three other restaurants serving “drive-through” fast food (a Taco Bell, a Kentucky Fried Chicken, and a small family-owned Chinese restaurant).

The owner of the two Burger King restaurants provides PWC with the data shown in Table 1. Q is the total number of Combination 1 meals sold at both locations during each week in 1998. P is the average price charged for a Combination 1 meal at the two locations. [Prices are identical at the two Burger King locations.] Every week the Burger King owner advertises special price offers at its two restaurants exclusively in daily newspaper advertisements. A is the dollar amount spent on newspaper ads for each week in 1998. The owner could not provide PWC with data on prices charged by other competing restaurants during 1998. For the one-year time period of the study, household income and population in the suburb did not change enough to warrant inclusion in the demand analysis.

TABLE 1: Weekly Sales Data for Combination 1 Meals (1998)

week	Q	P	A	week	Q	P	A
1	51,345	2.78	4,280	27	78,953	2.27	21,225
2	50,337	2.35	3,875	28	52,875	3.78	7,580
3	86,732	3.22	12,360	29	81,263	3.95	4,175
4	118,117	1.85	19,250	30	67,260	3.52	4,365
5	48,024	2.65	6,450	31	83,323	3.45	12,250
6	97,375	2.95	8,750	32	68,322	3.92	11,850
7	75,751	2.86	9,600	33	71,925	4.05	14,360
8	78,797	3.35	9,600	34	29,372	4.01	9,540
9	59,856	3.45	9,600	35	21,710	3.68	7,250
10	23,696	3.25	6,250	36	37,833	3.62	4,280
11	61,385	3.21	4,780	37	41,154	3.57	13,800
12	63,750	3.02	6,770	38	50,925	3.65	15,300
13	60,996	3.16	6,325	39	57,657	3.89	5,250
14	84,276	2.95	9,655	40	52,036	3.86	7,650
15	54,222	2.65	10,450	41	58,677	3.95	6,650
16	58,131	3.24	9,750	42	73,902	3.91	9,850
17	55,398	3.55	11,500	43	55,327	3.88	8,350
18	69,943	3.75	8,975	44	16,262	4.12	10,250
19	79,785	3.85	8,975	45	38,348	3.94	16,450
20	38,892	3.76	6,755	46	29,810	4.15	13,200
21	43,240	3.65	5,500	47	69,613	4.12	14,600
22	52,078	3.58	4,365	48	45,822	4.16	13,250
23	11,321	3.78	9,525	49	43,207	4.00	18,450
24	73,113	3.75	18,600	50	81,998	3.93	16,500
25	79,988	3.22	14,450	51	46,756	3.89	6,500
26	98,311	3.42	15,500	52	34,592	3.83	5,650

- a. Using the data in Table 1, specify a linear functional form for the demand for Combination 1 meals, and run a regression to estimate the demand for Combo 1 meals.
- b. Should you use the ordinary least-squares (OLS) method or the two-stage least-squares method (2SLS) method for estimating industry demand for rutabagas? Explain briefly.
- c. Using statistical software, estimate the parameters of the empirical demand function specified in part *a*. Write your estimated industry demand equation for rutabagas.
- d. Evaluate your regression results by examining signs of parameters, *p*-values (or *t*-ratios), and the R^2 .
- e. Discuss how the estimation of demand might be improved.
- f. Using your estimated demand equation, calculate an own-price elasticity and an advertising elasticity. Compute the elasticity values at the sample mean values of the data in Table 1. Discuss, in quantitative terms, the meaning of each elasticity.
- g. If the owner plans to charge a price of \$4.15 for a Combination 1 meal and spend \$18,000 per week on advertising, how many Combination 1 meals do you predict will be sold each week?
- h. If the owner spends \$18,000 per week on advertising, write the equation for the inverse demand function. Then, calculate the demand price for 50,000 Combination 1 meals.