

ECON 5103 Unit 3, Video 4
Estimating Demand equations
Regression analysis

WARNING! In the real world, experienced statisticians should do regression analysis! DO NOT ATTEMPT REGRESSION ANALYSIS WITHOUT THE ASSISTANCE OF AN EXPERT IN STATISTICS.

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Simplified fake example:

You own a soda machine; you have sold cans of soda out of the machine for 20 years. You have a theory:

The number of cans of soda that you sell per week depends upon three things:

1. the price you charge for each can of soda
2. the average weekly income of a typical buyer
3. the price charged at the soda machine down the street.

$$Q = (?) + (?) \text{Price per can} + (?) \text{Income} + (?) \text{P.comp.}$$

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<u>year</u>	<u>Quantity bought</u>	<u>Price per can</u>	<u>income per buyer</u>	<u>price per can at competitor</u>
1987	1000	\$ 1.00	\$ 500.00	\$ 1.00
1988	950	\$ 1.10	\$ 500.00	\$ 1.00
1989	960	\$ 1.10	\$ 550.00	\$ 1.00
1990	980	\$ 1.10	\$ 550.00	\$ 1.20
1991	1000	\$ 1.00	\$ 550.00	\$ 1.20
1992	990	\$ 1.10	\$ 530.00	\$ 1.20
1993	1200	\$ 1.20	\$ 600.00	\$ 1.10
1994	1200	\$ 1.25	\$ 605.00	\$ 1.25
1995	1000	\$ 1.50	\$ 610.00	\$ 1.25
1996	1050	\$ 1.40	\$ 625.00	\$ 1.30
1997	1000	\$ 1.50	\$ 625.00	\$ 1.20
1998	800	\$ 1.75	\$ 630.00	\$ 1.25
1999	600	\$ 2.00	\$ 600.00	\$ 1.20
2000	900	\$ 1.50	\$ 650.00	\$ 1.25
2001	1200	\$ 1.00	\$ 660.00	\$ 1.25
2002	1100	\$ 1.10	\$ 650.00	\$ 1.20
2003	900	\$ 1.20	\$ 640.00	\$ 1.10
2004	1500	\$ 1.20	\$ 740.00	\$ 1.10
2005	1600	\$ 1.20	\$ 750.00	\$ 1.25
2006	1000	\$ 1.50	\$ 700.00	\$ 1.25
2007	1200	\$ 1.25	\$ 720.00	\$ 1.30

	<i>Coefficients</i>
Intercept	489.3580859
Price per can	-543.6811578
income per buyer	2.235885197
price per can at competitor	-101.7014844

$$Q_{sodas} = 489.36 - 543.68(\text{Price per can}) + 2.236(\text{Income per buyer}) - 101.7(\text{Price per can at competitor})$$

Using the demand equation to predict future sales.
 Example: Suppose next year you will charge \$1 per can, and you predict that your buyer's income will be \$500 and your competitor will charge \$1.20

Forecast sales:

$$Q_{sodas} = 489.36 - 543.68(1) + 2.236(500) - 101.7(1.20) = 1547.479 \text{ cans}$$