

Econ 101
Properties of Elasticities

Consider the following data on demand for 2 goods shoes (S) and coats (C). The notation is as follows:
PS = price of shoes, PC = price of coats, I = income, DS = demand for shoes, DC = demand for coats.

DS, I = 1000					DS, I = 2000				
PS	PC = 10	I	DS, PC = 10	DC	PS	PC = 10	I	DS, PC = 10	DC
10.00	10.00	1000.00	30.50	69.50	10.00	10.00	2000.00	60.50	139.50
22.00	10.00	1000.00	13.49	70.34	22.00	10.00	2000.00	27.12	140.34
26.00	10.00	1000.00	11.30	70.62	26.00	10.00	2000.00	22.84	140.62
30.00	10.00	1000.00	9.70	70.90	30.00	10.00	2000.00	19.70	140.90
34.00	10.00	1000.00	8.48	71.18	34.00	10.00	2000.00	17.30	141.18
38.00	10.00	1000.00	7.52	71.46	38.00	10.00	2000.00	15.41	141.46
42.00	10.00	1000.00	6.73	71.74	42.00	10.00	2000.00	13.88	141.74
46.00	10.00	1000.00	6.09	72.02	46.00	10.00	2000.00	12.61	142.02

DS, I = 1000					DS, I = 2000				
PC = 60	I	DS, PC = 60	DC	PC = 60	I	DS, PC = 60	DC		
30.00	60.00	1000.00	11.70	10.82	30.00	60.00	2000.00	21.70	22.49
38.00	60.00	1000.00	9.09	10.91	38.00	60.00	2000.00	16.99	22.58
42.00	60.00	1000.00	8.16	10.96	42.00	60.00	2000.00	15.30	22.63

- Find the price elasticity of demand for shoes with an income of \$1,000 when the price of coats is \$10.00 as the price of shoes goes from \$30 to \$34. $e_{q_s P_s} = \frac{(9.70 \& 8.48)}{(30 \& 34)} \cdot \frac{(30\%34)}{(9.70\%8.48)} = 1.074$
- Find the price elasticity of demand for shoes with an income of \$2,000 when the price of coats is \$10.00 as the price of shoes goes from \$30 to \$34. $e_{q_s P_s} = \frac{(19.70 \& 17.30)}{(30 \& 34)} \cdot \frac{(30\%34)}{(19.70\%17.30)} = 1.038$
- Find the price elasticity of demand for shoes with an income of \$1,000 when the price of coats is \$10.00 as the price of shoes goes from \$42 to \$46. $e_{q_s P_s} = \frac{(6.73 \& 6.09)}{(42 \& 46)} \cdot \frac{(42\%46)}{(6.73\%6.09)} = 1.098$
- Find the price elasticity of demand for shoes with an income of \$2,000 when the price of coats is \$10.00 as the price of shoes goes from \$42 to \$46. $e_{q_s P_s} = \frac{(13.88 \& 12.61)}{(42 \& 46)} \cdot \frac{(42\%46)}{(13.88\%12.61)} = 1.055$
- Find the price elasticity of demand for coats with an income of \$1,000 when the price of shoes is \$30.00 as the price of coats goes from \$10 to \$60. $e_{q_c P_c} = \frac{(70.90 \& 10.82)}{(10 \& 60)} \cdot \frac{(10\%60)}{(70.90\%10.82)} = 1.0293$
- Find the price elasticity of demand for coats with an income of \$1,000 when the price of shoes is \$42.00 as the price of coats goes from \$10 to \$60. $e_{q_c P_c} = \frac{(71.74 \& 10.96)}{(10 \& 60)} \cdot \frac{(10\%60)}{(71.74\%10.96)} = 1.0289$
- Find the income elasticity of shoes when the price of shoes is \$22, the price of coats is \$10, and income goes from \$1,000 to \$2,000. $e_{q_s I} = \frac{(13.49 \& 27.12)}{(1000 \& 2000)} \cdot \frac{(1000\%2000)}{(13.49\%27.12)} = 1.007$
- Find the income elasticity of shoes when the price of shoes is \$46, the price of coats is \$10, and income goes from \$1,000 to \$2,000. $e_{q_s I} = \frac{(6.09 \& 12.61)}{(1000 \& 2000)} \cdot \frac{(1000\%2000)}{(6.09\%12.61)} = 1.046$
- Find the cross price elasticity of shoe demand with respect to the price of coats when income is \$1,000, the price of shoes is \$30.00 and the price of coats goes from \$10 to \$60. $e_{q_s P_c} = \frac{(9.70 \& 11.70)}{(10 \& 60)} \cdot \frac{(10\%60)}{(9.70\%11.70)} = 0.1308$
- Find the cross price elasticity of shoe demand with respect to the price of coats when income is \$1,000, the price of shoes is \$42.00 and the price of coats goes from \$10 to \$60. $e_{q_s P_c} = \frac{(6.73 \& 8.16)}{(10 \& 60)} \cdot \frac{(10\%60)}{(6.73\%8.16)} = 0.134$
- Find the cross price elasticity of coat demand with respect to the price of shoes when income is \$2,000, the price of coats is \$10.00 and the price of shoes goes from \$22 to \$26. $e_{q_c P_s} = \frac{(140.34 \& 140.62)}{(22 \& 26)} \cdot \frac{(22\%26)}{(140.34\%140.62)} = 0.0119$
- Find the cross price elasticity of coat demand with respect to the price of shoes when income is \$1,000, the price of coats is \$60.00 and the price of shoes goes from \$38 to \$42. $e_{q_c P_s} = \frac{(10.91 \& 10.96)}{(38 \& 42)} \cdot \frac{(38\%42)}{(10.91\%10.96)} = 0.0457$

Analysis of Elasticities

1. The elasticity of demand for shoes is *elastic* at all the points considered. See a,b,c and d.
2. The elasticity of demand for coats is *elastic* at all the points considered. See e and f.
3. The *income elasticity* for shoes indicates that shoes are a normal good because the elasticity is positive. They are also a luxury good because the income elasticity is greater than 1. See g and h.
4. The demand for shoes is more elastic at higher prices, given the same income. Compare a and c or b and d.
5. The demand for shoes is less elastic for the same price change at higher income levels. Compare a and b or c and d.
6. The demand for coats is less elastic for the same price change as the shoe price rises. Compare e and f.
7. The income elasticity of shoes is higher when the shoe price is higher. Compare g and h.
8. Cross price elasticities are much lower than own price elasticities. Compare a-f with i - l.
9. Shoes and coats are substitutes. See i, j, k and l.
10. The cross price elasticity of shoes with respect to the price of coats rises with a rise in the price of shoes. Compare i and j.