

## RESIDUAL PRICE ELASTICITY

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### ABSTRACT

*It is a tough task to set the right price for a product or service. Elasticity can be described as the degree of impact of change in the price of a firm on the demand of the product and on the price of competitor's product? The concept of residual price elasticity introduces competitive dynamics in the pricing process. It incorporates competitor reactions and cross elasticity. This, in turn, helps explain why prices in daily life are rarely set at the optimal level suggested by a simpler view of elasticity. Marketers consciously or unconsciously factor competitive dynamics into their pricing decisions. It's a combination of 3 Factors like Own Price Elasticity, Competitor Reaction Elasticity, and Cross Elasticity. Many a time we discuss the elasticity, taking other factors as constant, which is not practically applicable in real life situation. From the example, it is evident that competitor reactions and cross elasticity are expected to reduce the firm's initially projected sales increase.*

**KEYWORDS:** *Own Price Elasticity, Competitor Reaction Elasticity, Cross Elasticity, Residual Price Elasticity, Demand*

### INTRODUCTION

It is a tough task to set the right price for a product or service. In fact, determining price is one of the toughest things a marketer has to do, in large part because it has such an immense impact on the company's bottom line. One of the critical elements of pricing understands what economists call elasticity. The concept of residual price elasticity introduces competitive dynamics in the pricing process. It incorporates competitor reactions and cross elasticity. This, in turn, helps explain why prices in daily life are rarely set at the optimal level suggested by a simpler view of elasticity. Marketers consciously or unconsciously factor competitive dynamics into their pricing decisions.

Often, in daily life, price elasticity doesn't quite correspond to the relationships discussed

In the prior section. Managers may find, for example, that their estimates of this key metric are not equal to the negative of the reciprocal of their margins. Does this mean they're setting prices that are not optimal? Perhaps. It is more likely, however, that they're including competitive factors in their pricing decisions. Rather than using elasticity as estimated from current market conditions, marketers may estimate—or intuit—what elasticity *will be* after competitors respond

For a proposed change in price. This introduces a new concept, residual price elasticity—customers' elasticity of demand in response to a change in price, *after* accounting for any increase or decrease in competitors' prices that may be triggered by the initial change.

## Residual Price Elasticity is the Combination of Three Factors

### “Own” Price Elasticity

Own Price elasticity of demand is a measurement of the association between a change in the price of a particular good and a change in its quantity demanded. It is an important concept in economics frequently used while discussing price sensitivity. The method for calculating the price elasticity of demand is:

$$\text{Price Elasticity of Demand} = \% \text{Change in Quantity Demanded} / \% \text{Change in Price}$$

### “Competitor Reaction” Elasticity”

The reaction of competitor’s price change to a firm’s price change is known as Competitor Reaction Elasticity.

### “Cross” Elasticity

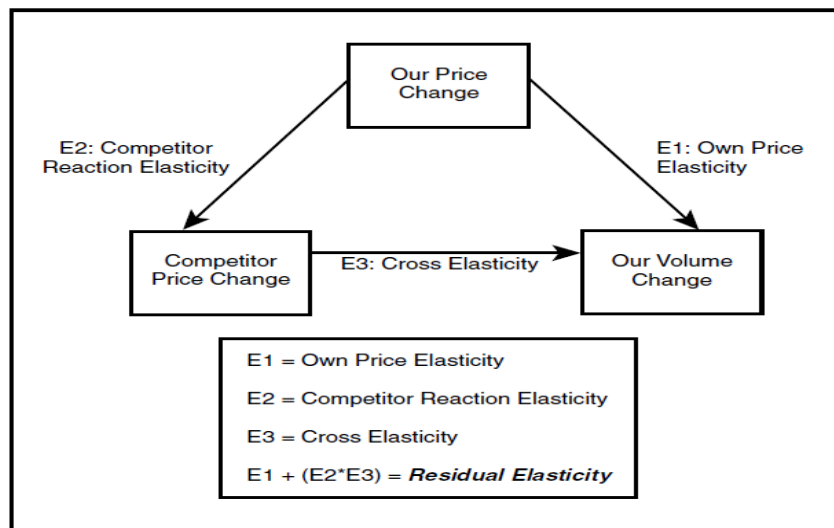
Cross Elasticity of demand is an economic concept that measures the reaction of demand of one good when a Price change takes place in Substitute Good.

Cross Elasticity is measured by taking the percentage change in the quantity demanded of one good, divided by the percentage change in the price of the substitute good.

$$\text{Residual Price Elasticity (I)} = \text{Own Price Elasticity (I)} + [\text{Competitor Reaction Elasticity (I)} * \text{Cross Elasticity (I)}]$$

The greater the competitive reaction anticipated, the more residual price elasticity will differ from a company’s own price elasticity.

**Figure 1: Residual Price**



(Paul W Farris *et al* (2011), Marketing Metrics, Pearson, pp253)

### Calculation

To calculate residual price elasticity, three inputs are needed:

### Own Price Elasticity

Own Price Elasticity is the change in a firm's unit sales, resulting from its initial price change, taking the competitors' prices remain unchanged.

### Competitor Reaction Elasticity

The extent and direction of the price changes that are likely to be made by competitors in response to a firm's initial price change. If competitor reaction elasticity is 0.5, for example, then as a firm reduces its prices by a small percentage, competitors can be expected to reduce their own prices by half that percentage. If competitor reaction elasticity is -0.5, then as a firm reduces its prices by a small percentage, competitors will *increase* their prices by half that percentage. This is a less common scenario, but it is possible.

### Cross Elasticity With Regard to Competitor Price Changes

The percentage and direction of the change in the initial firm's sales that will result from a small percentage change in competitors' prices. If cross elasticity is 0.25, then a small percentage increase in competitors' prices will result in an increase of one-fourth that percentage of the initial firm's sales. Note that the sign of cross elasticity is generally the reverse of the sign of own price elasticity. When competitors' prices rise, a firm's sales will usually increase, and vice versa.

### Residual Price Elasticity (I) = Own Price Elasticity (I) + [Competitor Reaction Elasticity (I) \* Cross Elasticity (I)]

The Percentage change in Sales of a firm can be measured by multiplying its own Price change by its residual price elasticity.

### Change in Sales from Residual Elasticity (%) = Own Price Change (%) \* Residual Price Elasticity (I)

Forecasts of any change in sales to be generated by a price change, thus should take into account the subsequent competitive price reactions that can be reasonably expected, as well as the second-order effects of those reactions on the sales of the firm making the initial change. The net effect of adjusting such reactions might be to amplify, diminish, or even reverse the direction of the change in sales that was expected from the initial price change.

### Example

A company decides to reduce the price by 15% (price change = -15%). It has estimated its own price elasticity to be -2. Ignoring competitive response, the company would expect a 10% price reduction to yield an approximately 30% increase in sales (-2 \* -15%).

The company estimates competitor reaction elasticity to be 1. That is, in response to the firm's activities, competitors are expected to shift pricing in the same direction and by an equal percentage.

The company estimates cross elasticity to be 0.8. That is, a small percentage change in competitors' prices will result in a change in the firm's own sales of 0.8 percent. On this basis,

$$\begin{aligned} \text{Residual Elasticity} &= \text{Own Price Elasticity} + (\text{Competitor Reaction Elasticity} * \text{Cross Elasticity}) \\ &= -2 + (1 * 0.8) \end{aligned}$$

$$=-2 + 0.8$$

$$=-1.2$$

Sales Increase = Change in Price \* Residual Elasticity

$$=-15\% * -1.2$$

$$= 18\% \text{ Increase in Sales}$$

Competitor reactions and cross elasticity are expected to reduce the firm's initially projected sales increase from 30% to 18%.

## CONCLUSIONS

Many a time we discuss the elasticity, taking other factors as constant, which is not practically applicable in real life situation. From the example, it is evident that competitor reactions and cross elasticity are expected to reduce the firm's initially projected sales increase.

## REFERENCES

1. Paul W Farris et al (2011), *Marketing Metrics, Pricing Strategy*(pp.251-256) Pearson
2. <http://www.businessdictionary.com/definition/elasticity-of-demand.html>
3. <https://hbr.org/2015/08/a-refresher-on-price-elasticity>
4. Palić, Irena, Ksenija Dumičić, and Dajana Barbić. "The estimation of money demand elasticity: case of Croatia." *ICHSS 2016: International Conference on Humanities and Social Sciences*. 2016.
5. [http://www.economicsonline.co.uk/Competitive\\_markets/Price\\_elasticity\\_of\\_demand.html](http://www.economicsonline.co.uk/Competitive_markets/Price_elasticity_of_demand.html)
6. <http://www.investopedia.com/terms/c/cross-elasticity-demand.asp>