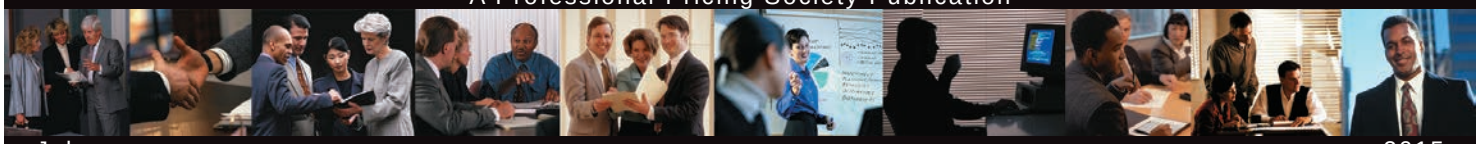
PROFESSIONAL PRICING SOCIETY

The PRICING ADVISOR

The Pricing Advisor™ is published monthly by the Professional Pricing Society
3535 Roswell Road, Suite 59
Marietta, GA 30062
770-509-9933
www.pricingsociety.com
Kevin Mitchell, Publisher

A Professional Pricing Society Publication



July 2015

Price Elasticity: Practical Implementation Lessons

Price Elasticity of Demand is one of the most difficult and controversial tasks of forecasting price variations impacts. There are a certain number of myths and best practices we must consider in order to have simple and efficient estimations of these impacts. The purpose of this article is to share some of our practical achievements in this exciting field of the Pricing Science. Author André Koeppl is the Knowledge Manager at Quantiz Pricing Solutions. He can be reached at akoeppl@quantiz.com.br.

Myth #1: Price Elasticity is static

Since 2006, our project experience in different segments confirms the economic theory that the Price Elasticity of Demand depends on several variables. Some of them are listed below.

Long term variables:

- Easiness of product/service substitution
- Number of similar substitutes in the market
- Degree of product/service differentiation
- Degree of importance in the budget of the buyer's clients
- Share of buy of the clients
- Time length and cycle of sales
- Price transparency
- Implicit cost of changing suppliers
- Brand value/image

Short term variables:

- Market share
- Variations in market share
- Price point related to the average market price point
- Prices of the leader

CONTINUED ON NEXT PAGE ➔

In This Issue:

Have a pricing article, case study or story to share? Send articles to editor@pricingsociety.com.

PPS Happenings

Serving the Pricing Community Since 1984

Upcoming Events

PPS 2nd Annual Latin America Pricing Workshops & Conference – Sheraton WTC Hotel – São Paulo, Brazil / 16-17 September 2015

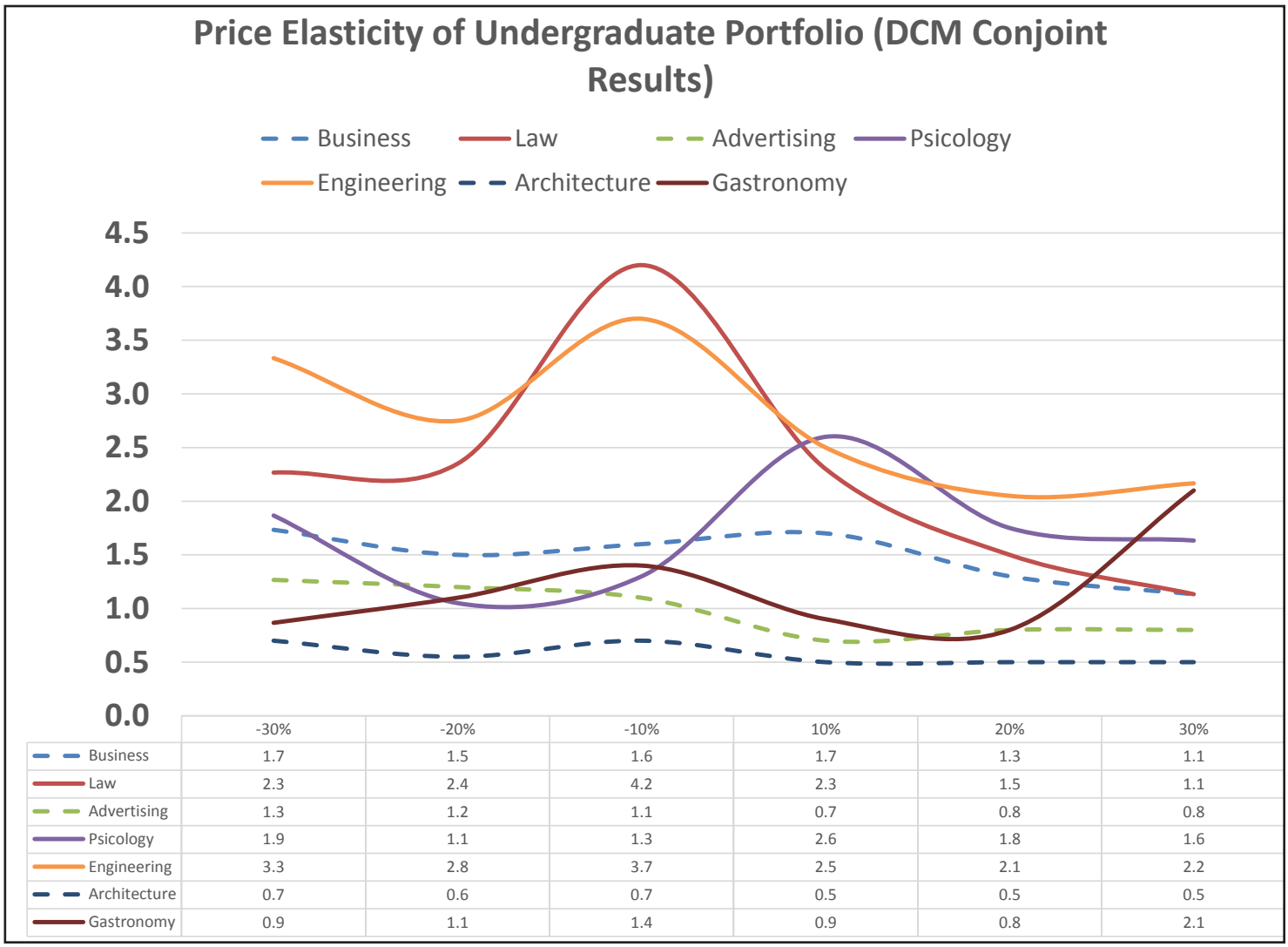
26th Annual North American Fall Pricing Workshops & Conference – The Palace Hotel – San Francisco / October 20 - 23, 2015

11th Annual European Pricing Workshops & Conference – Mövenpick Hotel – Amsterdam, Netherlands / 2-4 December 2015

For the most up-to-date information about PPS events and programs, please visit our website at www.pricingsociety.com frequently.

The PRICING ADVISOR
A Professional Pricing Society Publication
3535 Roswell Road, Suite 59
Marietta, GA 30062
770-509-9933
www.pricingsociety.com

Figure 1



	-30%	-20%	-10%	10%	20%	30%
Business	1.7	1.5	1.6	1.7	1.3	1.1
Law	2.3	2.4	4.2	2.3	1.5	1.1
Advertising	1.3	1.2	1.1	0.7	0.8	0.8
Psicology	1.9	1.1	1.3	2.6	1.8	1.6
Engineering	3.3	2.8	3.7	2.5	2.1	2.2
Architecture	0.7	0.6	0.7	0.5	0.5	0.5
Gastronomy	0.9	1.1	1.4	0.9	0.8	2.1

- Price gaps related to the main competitor
- (Psychological) Price references
- Dynamic of the market

The long term variables are inputs that tend to change slowly in the market and determine the steady part of the elasticity. Generally speaking, they are qualitative variables and it is very hard to measure the importance of these attributes in the elasticity number.

The short term variables are quantitative inputs whose importance are usually easy to measure. You can use multi-variable correlation analysis and/or some regression models to determine which of them you can use to forecast price impacts in the market.

Price elasticity is NOT static because the market is NOT static either. Many players will change strategy and tactics. Meanwhile, others will react to them, including the consumers.

The dynamism of the elasticity can be captured by the short term variables. The more dynamic the market and its prices, the more elastic the market becomes and the more often you will have to re-estimate elasticity.

Some elasticity estimations can become obsolete after six months, as is the case with technology products and services. We suggest that you re-estimate elasticity periodically and keep all your databases updated.

Myth#2: One number **fits all needs**

Because the market is NOT static, it is important to keep in mind that you can have at least two elasticity measures:

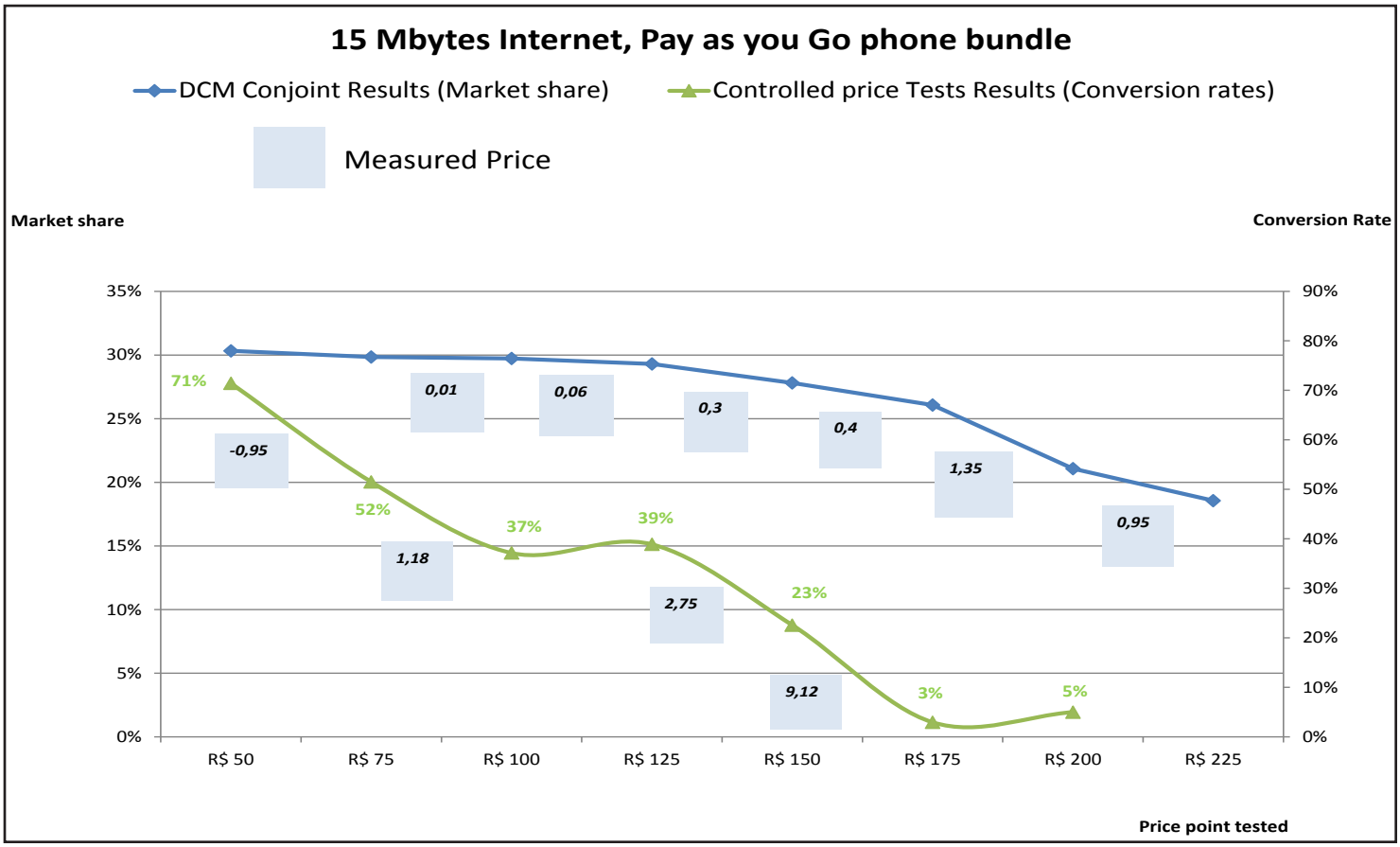
• Long term elasticity
• Short term elasticity

When using quantitative methods, a 12-month to 24-month monthly/weekly database can be used to measure the short term elasticity. In order to capture the long term elasticity, we advise longer databases or specific surveys methods, like Conjoint Analysis.

CONTINUED ON NEXT PAGE ➔

The PRICING ADVISOR
A Professional Pricing Society Publication
3535 Roswell Road, Suite 59
Marietta, GA 30062
770-509-9933
www.pricingsociety.com

Figure 2



However, you must consider two additional situations in order to determine correctly your forecast model:

- Discount elasticity
- Price lists changes

Discount elasticity has proven to be bigger than short term elasticity. It is hard to estimate when the company plays different kinds of promotions, or when there are always many competitors' promotional actions taking place. It is difficult to correctly measure the efficiency of these kind of actions because promotions tend to cause pre and after hangovers in the clients.

Let's remember the classical formula of the elasticity:

$$\epsilon = \frac{\%\Delta Volume}{\%\Delta Price}$$

Have you ever used this formula when repositioning some products prices at the same time you update all your price lists?

The problem is that the yearly price/inflation increases tend to distort the perception of volume losses. Consumers and the market expect the new price increases. So, if you increase your prices following the official inflation rate, you will probably not lose volume.

You can solve this problem but adjusting the formula:

$$\epsilon = \frac{\%\Delta Volume}{(\%\Delta Price - \%Inflation)}$$

Only the differential price move is responsible for a volume loss/gain. So, you must understand which measure of elasticity is proper to use in each situation.

Myth#3: Price elasticity is a linear constant

The classical formula presupposes that the elasticity number is a constant, whatever the price or its variation:

$$\epsilon = \frac{\%\Delta Volume}{\%\Delta Price}$$

And it presupposes that the relation between volume and price is linear:

$$v(t+1) = v(t) * (1 - \epsilon * \%\Delta Price)$$

$$v(t+1) = v(t) * (1 - \epsilon * \frac{p(t+1) - p(t)}{p(t)})$$

Volume of today: constant — Price of today: constant

$$v(t+1) = \alpha * p(t+1) + \beta$$

However, our practical experience in several projects have proven that elasticity can be approximated by a linear constant in some specific price bands, as shown by the dotted lines in Figure 1 on the previous page.

For Business, Advertising and Architec-

CONTINUED ON NEXT PAGE ➔

The PRICING ADVISOR
A Professional Pricing Society Publication
3535 Roswell Road, Suite 59
Marietta, GA 30062
770-509-9933
www.pricingsociety.com

ture courses, you can infer two kinds of elasticity:

- Elasticity when lowering prices
- Elasticity when increasing prices

Despite this linearity by parts of these courses, our experience has proven that elasticity is non-linear and can change abruptly, as you can see in the case of Engineering and Law courses.

Studies have proven that humans aren't linear. That's why in many cases you can try exponential, logarithmic or other models of elasticity. Keep in mind that the more distant the price point is in comparison to the today's price point, the less reliable your linear constant elasticity model will be.

Myth#4: All the methods to measure it will converge to a magic number

We have pointed that there are several kinds of elasticity numbers. These numbers will vary depending on the method you measure or estimate them. The way you measure elasticity affects your perception.

In Figure 2 you can compare two measures of short term elasticity: by Conjoint Analysis and by Price tests.

This is the example of the consumer situation affecting the measure of the desired experiment. The Conjoint elasticity was lower than the Price test elasticity because the answerers of the Conjoint weren't in the real buying experience, so their decisions were risk free. On the contrary, a very well statistically planned and executed price test presented us with bigger, non-linear elasticity.

So, depending on the method, you can get to different numbers of elasticity. You must take into consideration the real experience of consumers in order to correctly estimate the elasticity and avoid making bad decisions, such as increasing prices because of apparent inelasticity shown by the Conjoint analysis.

Our experience points to the following methods, ranked in order of efficiency (1- the best/6- the worst):

1. Statistically controlled price tests
2. Price surveys regression analysis
3. Conjoint analysis research
4. Direct price research
5. Expert judgment
6. Internal database analysis (volumes x net prices)

Myth#5: Price elasticity is a One Variable Function

Remember our short term list of factors that affects the elasticity. All of them point to the fact that elasticity is dependent of external factors or players.

It's very simplistic to assume the elasticity only depends on your own prices. Your prices affect all the other players as theirs affect your prices. The unique situation when you can use a one variable elasticity model is when you don't have any market information.

Using a 24-month Nielsen Scantrack database, we have mapped all the elasticities of a consumer goods supplier among many different selling channels see Figure 3. Testing many regression models, we concluded that a non-linear cross-elasticity model fit better than any other model.

The table a-) shows the result of a one variable (price) model and its quadratic error sum (the indicator that shows how next the model is to the reality).

The table b-) shows the result of a more complex regression model, considering the self-elasticity and the cross-elasticity of the main competitors. This solution is just 623 times better than the one variable model.

Conclusions

Estimating elasticity demands a little more math than we usually use in our pricing activities. It's an exploratory action and you need to be patient and very analytical to correctly arrive at good solutions.

And, despite all of the work you will have to complete to obtain it, the elasticity number itself is less important than you imagine. It serves very well to forecast impacts on your sales, clients and competitors, but the reality will be always determined by external factors and players. Things can go in other directions that you never imagined or simulated before, so collect all of the data you can, prepare yourself with good Excel simulators and be ready to be very flexible in new situations.

Figure 3

a-) Elasticity model considering just price as variable

	Regression coefficients			
	Player 1	Player 2	Player 3	Player 4
Player 1	-0,89	0,00	0,00	0,24
Player 2	0,00	-1,56	0,00	0,00
Player 3	0,00	0,00	-1,25	0,00
Player 4	0,00	0,00	0,00	-1,20

Quadratic Error Sum 52,786

b-) Elasticity model considering self elasticity and cross elasticities

	Regression coefficients			
	Player 1	Player 2	Player 3	Player 4
Player 1	-1,27	1,29	0,57	0,24
Player 2	0,34	-0,65	0,19	0,98
Player 3	1,11	1,71	-2,49	0,59
Player 4	0,04	1,55	0,48	-0,78

Quadratic Error Sum 0,085