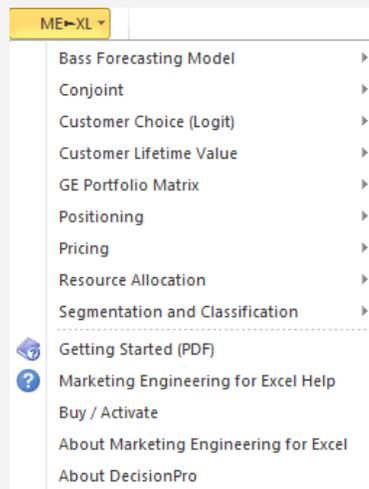Tutorial
Pricing

Marketing Engineering for Excel is a *Microsoft Excel* add-in. The software runs from within Microsoft Excel and only with data contained in an Excel spreadsheet.

After installing the software, simply open *Microsoft Excel*. A new menu appears, called "*ME▸XL.*" This tutorial refers to the "*ME▸XL/Pricing*" submenu.

Overview

The Pricing model introduced in Marketing Engineering for Excel is based on the Gabor-Granger method, which offers a relatively simple approach to estimate customer's willingness to buy at different price points (and to interpolate between these price points).

The Pricing model works as follows:

1. Respondents are asked to indicate their buying intention for a product at a number of different price levels (at least 3, usually more). They answer on a Likert scale ranging from "will never buy" to "will definitely buy".
2. These answers are transformed into purchasing probabilities. Although the exact probabilities might vary depending on the context, the product, the industry, or experience, respondents are notoriously known to overstate their purchase likelihood. For instance, a respondent who indicates that he will "definitely buy" might be assigned an actual purchase probability of 50% or less.
3. These probabilities are aggregated and a response function is fit on the data, such that the aggregate demand level can be estimated at any price level.

The Gabor-Granger method is especially suited for optimizing price when all the other components (or attributes) of the product or service are fixed and cannot be changed. When the firm can change product attributes other than price (e.g., design, quality, power), it would be more appropriate to use conjoint analysis, where price is only one of the attributes among many.

Getting Started

Pricing analysis allows you to use your own data directly or to use a preformatted template.

Because the Pricing model requires a specific data format, users with their own data should to review the preformatted template to learn about the appropriate structure.

F.Y.I.

This section explains how to create an easy-to-use template to enter your own data.

If you want to run pricing analysis immediately, open the example file "*OfficeStar Data (Pricing).xls*" and jump to "Step 2: Running analysis." By default, the example files install in "*My Documents/My Marketing Engineering/.*"

Step 1   Creating a template

In Excel, if you click on ME ▸ XL → PRICING → CREATE TEMPLATE, a dialog box will appear. This box represents the first step in creating a template for running the Pricing model.

Marketing Engineering for Excel will prompt you to enter the parameters required by the model and will then build a template spreadsheet that directs you to enter the required data. This generated template includes pre-selected cell ranges that correspond to the parameters you enter. We recommend that you use Marketing Engineering for Excel templates to simplify subsequent analyses.

Expert users who are familiar with Marketing Engineering for Excel models and data requirements may prefer to input data directly in an unformatted spreadsheet. Such users should become familiar with the data format that Marketing Engineering for Excel expects.

Unless you are already familiar with the methodology, you should use the ME ▸ XL template generation option to create a template.

The following dialog box allows you to create a template to run the Pricing model.
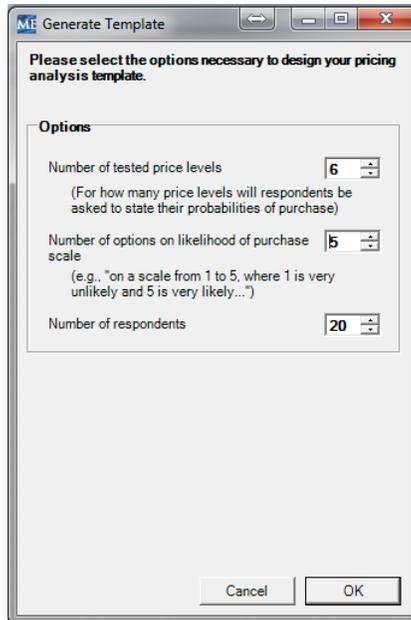
The options are as follows:

- **Number of tested pricing levels:** The number of pricing levels being evaluated in the study. A respondent will be asked as many questions as there are specified pricing levels. To allow for accurate model interpolation, there should be at the very least 3 or 4 pricing levels, but it is usually safer to go with more.

- **Number of options on likelihood of purchase:** The number of options provided for the likelihood of purchase. For instance, the scale used in the survey may contain 5 options, labelled: "will never buy", "will probably not buy", "may or may not buy", "will probably buy", and "will definitely buy".

- **Number of respondents:** The number of respondents in the study.

After selecting the desired model options, click OK to generate the data collection template, as shown below:

Step 2 Entering your data

Likelihood of Purchase Scale

Scale options (e.g., "on a scale from 1 to 5") and associated purchase probabilities.

Scale Options	1	2	3	4	5
Associated Probabilities	0%	0%	0%	20%	50%

Respondent Data

Purchase likelihood obtained for each price level from each respondent.
The first row should contain the tested price levels.

| Respondents / Price Levels	$5	$10	$15	$20	$25	$30
Respondent 1	5	5	5	4	3	1
Respondent 2	5	5	5	4	4	2
Respondent 3	5	5	4	3	3	1
Respondent 4	4	4	4	3	3	1
Respondent 5	5	5	4	3	2	1
Respondent 6	5	5	4	3	2	1
Respondent 7	4	4	3	2	2	1
Respondent 8	4	4	4	3	2	1
Respondent 9	5	5	5	4	3	1
Respondent 10	5	5	5	4	4	2
Respondent 11	3	3	2	1	1	1
Respondent 12	3	3	2	1	1	1
Respondent 13	4	4	4	3	2	1
Respondent 14	5	5	4	3	2	1
Respondent 15	2	2	2	2	2	1

A Pricing model spreadsheet contains:

- **Likelihood of Purchase Scale**. In the Gabor-Granger model, respondents are asked to express their purchase likelihood on a multiple-item scale, ranging for instance from "1 = Will never buy" to "5 = Will definitely buy". The Likelihood of Purchase Scale transforms these answers into actual probabilities ranging between 0% and 100%. Note that respondents are notoriously known to overstate their purchase probabilities, so that associated probabilities are rarely higher than 50%, even for the highest options on the scale. Although in practice, the associated probabilities are estimated based on past experience in similar product categories or via market research, ME▸XL will populate this table with commonly used values.

- **Respondent Data.** This matrix contains the respondents' answers. The first row contains the different price levels, in increasing order (from the lowest tested price level to the highest one). The first column contains respondents' ID's. All the other cells contain respondents' answers. For instance, in the example above, the first respondent answered that he "5 = will definitely buy" the product at a price of $5, $10 or $15; "4 = will likely buy" at a price of $20, etc.

Step 3   Running analyses

After you enter your data in an Excel spreadsheet with the appropriate format, click on ME▶XL → Pricing → Run Analysis. The dialog box that appears requires you to select the two matrices described above. If you used the template wizard, the cell range will be automatically selected. The "save choices in current spreadsheet" checkbox will save future cell range selections to facilitate additional analyses.
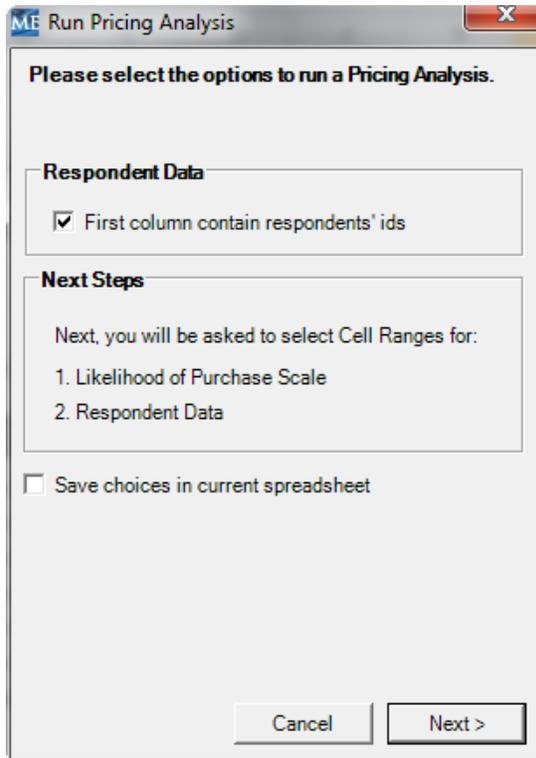
When you click "Next >" the following two dialog boxes will allow you to select the needed cell ranges. If you have used the template wizard, or have already selected cell ranges by enabling the "Save choices in current spreadsheet" option previously, these cell ranges will be pre-selected.
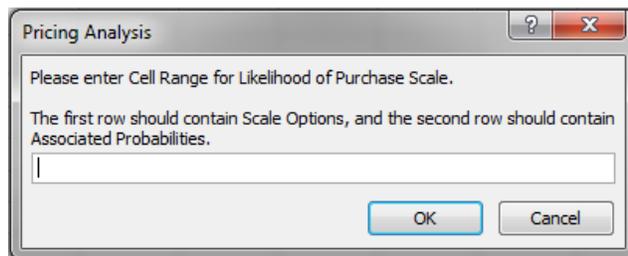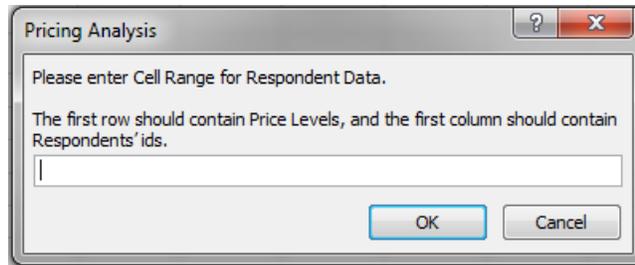
Step 4   Interpreting the results

The generated workbook contains several worksheets that describe the analysis.

Respondents' Answers

Likelihood of Purchase and expected Revenues for all tested Price Levels, obtained directly from respondents' answers.

Price Levels	5	10	15	20	25	30
Likelihood of Purchase	32%	31%	21%	5%	4%	0%
Expected Revenues	1.62	3.12	3.12	1.08	0.96	0.00

Model Predictions

Likelihood of purchase and expected revenues for all tested price levels, obtained from model predictions.
The last Price Level (in yellow) is the one that maximizes expected Revenues (within the tested range).

Price Levels	5	10	15	20	25	30	12.750
Likelihood of Purchase	33%	31%	21%	6%	1%	0%	27%
Expected Revenues	1.64	3.06	3.10	1.26	0.27	0.05	3.38

Model Parameters

Intercept, slope and ceiling (maxium purchase probability) for the pricing model.

Parameter	Value
Intercept	6.363
Slope	-0.391
Ceiling (max. prob.)	0.332
SSE	0.001

Respondents' Answers

This portion of the spreadsheet shows the aggregate likelihood of purchase at each of the corresponding price points. The expected revenue from each price point is also shown (this is a function of the likelihood of purchase). The data in this portion of the output is determined directly from the respondents' data.

Model Predictions

This portion of the spreadsheet shows the predicted revenue based on the Pricing model. Also shown (highlighted in yellow) is the price point that will maximize the revenue based on the specified price range in the study. Note that the model is usually good at interpolating for various price points, but might fall short at extrapolating outside the tested price ranges. As such, the model will not recommend price points higher (lower) than the maximum (minimum) tested price level.

Model parameters

The model that is used to fit the aggregate response function has the following functional form:

$$\text{Likelihood} = \text{Ceiling} / (1 + \text{EXP}(-(\text{Intercept} + (\text{Slope} * \text{Price}))))$$

- **Ceiling:** The maximum aggregate purchase likelihood. If the sample is representative of the whole market, the Ceiling would be seen as the maximum market share that could ever be achieved.

- **Intercept:** The inflection point of the response function. It can also be interpreted as the price at which half of the maximum potential is obtained. For instance, if the Ceiling is 27%, and the Intercept is $10, then the aggregate purchase probability at a price of $10 can be expected to be 13.5% (half of 27%).

- **Slope:** An indicator of price sensitivity. The higher the slope, the more sensitive respondents are to changes in price.

Likelihood of Purchase

This chart shows the slope of the purchase likelihood at various price points. Also shown is the optimal price point based on the price range modelled.

Likelihood of Purchase
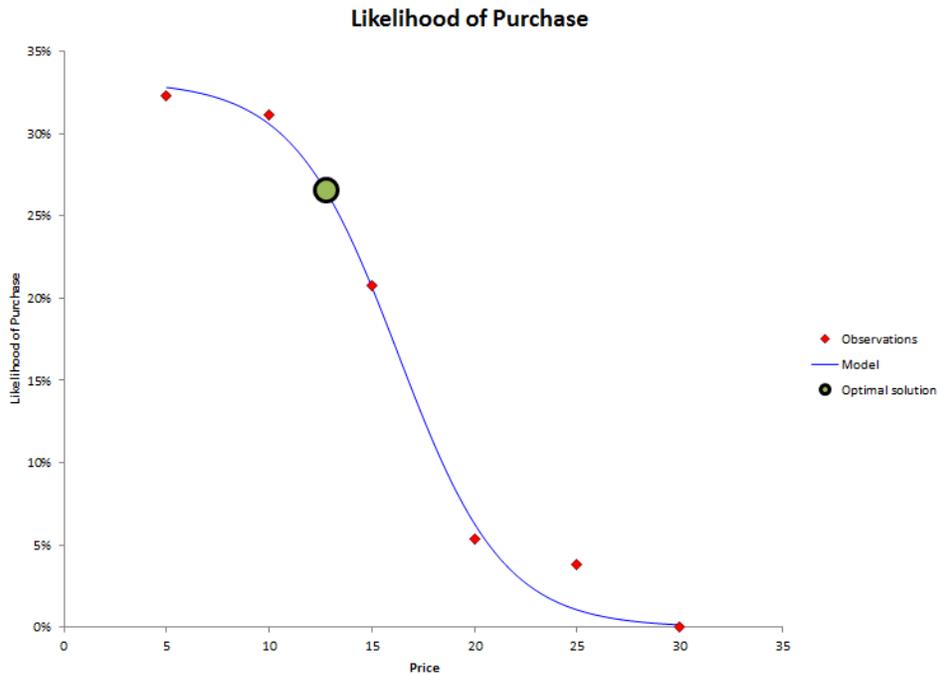
Revenue

This chart shows the slope of the revenue projected at the various price points based on the Pricing model. Also shown is the "optimal" price point based on the price range projected by the model.
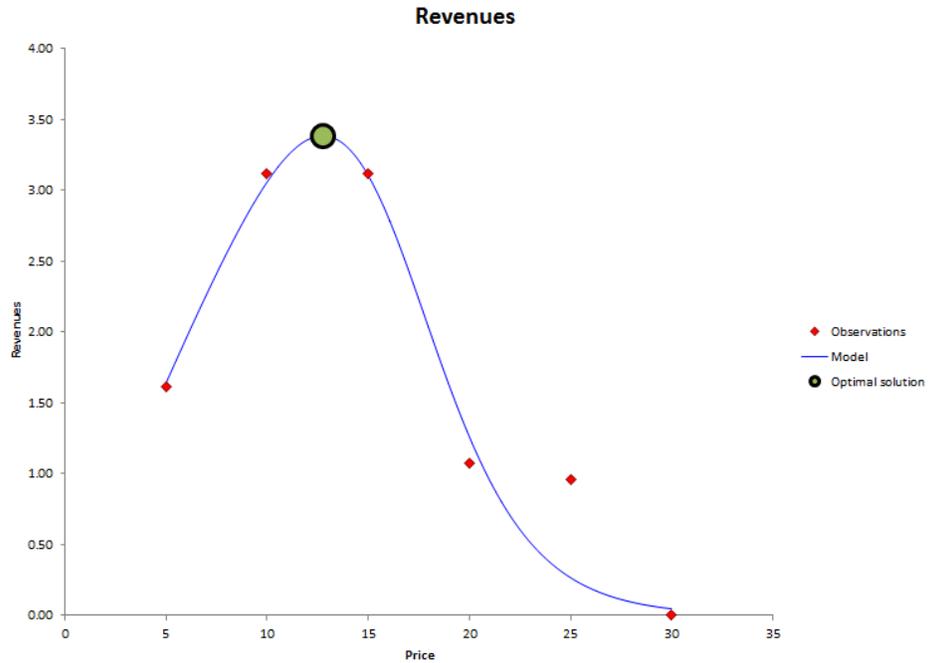
Note that the chart above shows the price point that maximizes revenue. It does not take into account fixed and marginal costs.