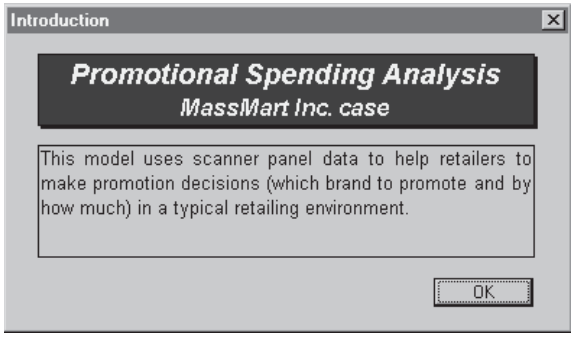
26. TUTORIAL FOR PROMOTIONAL SPENDING ANALYSIS (massmart.xls)

CASE: MASSMART, INC., P. 458

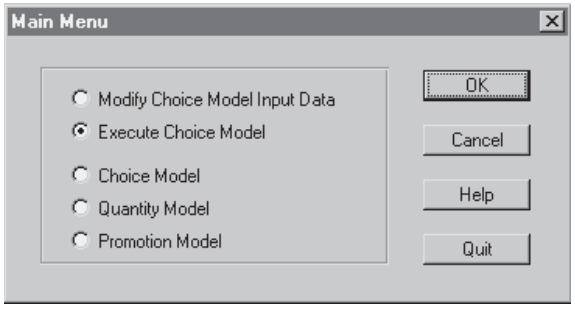
Promotional Spending Analysis helps retailers to develop brand-promotion schemes that will maximize a retail outlet's profits. This spreadsheet exercise implements the promotional analysis model for MassMart, Inc., a big mass merchandiser. Your task is to analyze and improve the promotional activities of the company's store in State College, Pennsylvania. The software includes three models for analyzing the store's promotional activities: the Choice Model, the Quantity Model and the Promotion Model.

***Note**: The Promotional Spending Analysis Excel spreadsheet relies on the Analysis Toolpak add-in to run a regression analysis. If this add-in is not already loaded, you should load it manually. To do so, go to the **Tools** menu, then **Add-Ins**, and choose **Analysis Toolpak**. If this option is not in the list, you will have to install it via the setup program in Excel (or MS Office).*

From the **Model** menu select **MassMart Inc. (XL)** under the **Promotional Spending Analysis** to see the **Introduction**.



From the **Model** menu of the Excel spreadsheet, choose **Main Menu**. The **Main Menu** dialog box looks like this:

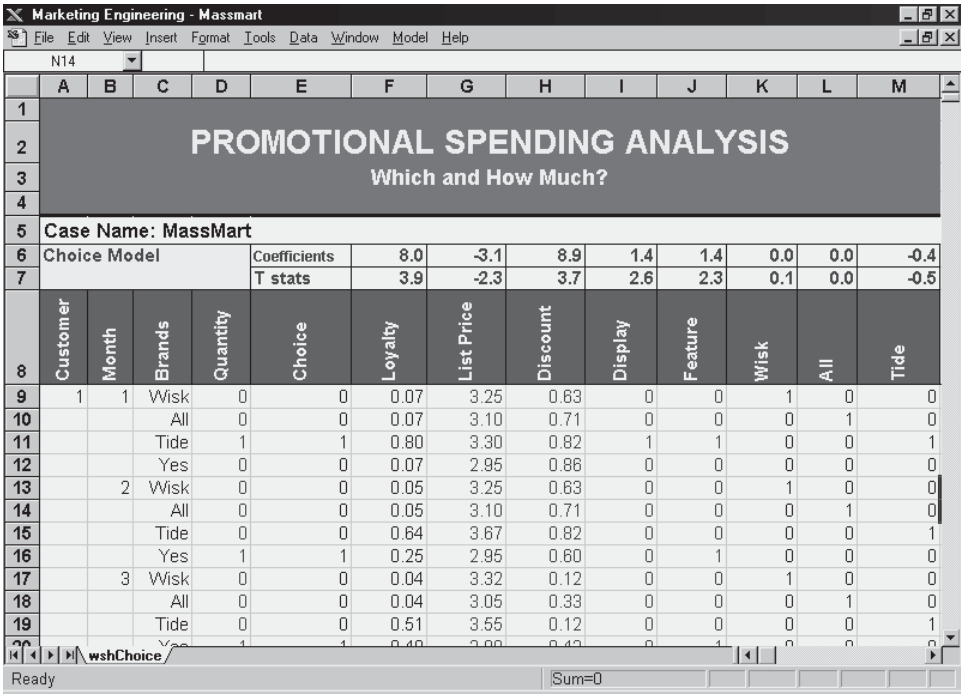


* Tutorial 26, June 2005

CHOICE MODEL

From the **Main Menu** dialog box, select **Execute Choice Model** and click **OK**. The Choice Model uses information on the quantity of various brands purchased by consumers and on retailer promotion activities at the time of purchase, such as discounts, feature ads, and displays. The model assesses the likelihood that a consumer will choose a particular brand based on the promotional activities directed at all the brands. After the model executes, it will display a spreadsheet that includes coefficients of each variable and the associated asymptotic t-statistics. The coefficient of each variable indicates the magnitude of that variable's impact on a consumer's probability of choosing each brand. The t-statistics indicate the statistical significance of the coefficients.

The Choice Model output screen looks like this:



Marketing Engineering - Massmart

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PROMOTIONAL SPENDING ANALYSIS

Which and How Much?

Case Name: MassMart

Choice Model				Coefficients	8.0	-3.1	8.9	1.4	1.4	0.0	0.0	-0.4	
				T stats	3.9	-2.3	3.7	2.6	2.3	0.1	0.0	-0.5	
Customer	Month	Brands	Quantity	Choice	Loyalty	List Price	Discount	Display	Feature	Wisk	All	Tide	
1	1	Wisk	0	0	0.07	3.25	0.63	0	0	1	0	0	
		All	0	0	0.07	3.10	0.71	0	0	0	1	0	
		Tide	1	1	0.80	3.30	0.82	1	1	0	0	1	
		Yes	0	0	0.07	2.95	0.86	0	0	0	0	0	
	2	Wisk	0	0	0.05	3.25	0.63	0	0	1	0	0	
		All	0	0	0.05	3.10	0.71	0	0	0	1	0	
		Tide	0	0	0.64	3.67	0.82	0	0	0	0	1	
		Yes	1	1	0.25	2.95	0.60	0	1	0	0	0	
	3	Wisk	0	0	0.04	3.32	0.12	0	0	1	0	0	
		All	0	0	0.04	3.05	0.33	0	0	0	1	0	
		Tide	0	0	0.51	3.55	0.12	0	0	0	0	1	

wshChoice

Ready Sum=0

QUANTITY MODEL

From the **Model** menu, select **Main Menu.** Then, select **Quantity Model** and click **OK** to see the Quantity Model output.

***Note**: Sometimes when **Quantity Model** is chosen from the **Main Menu** dialog box, Excel displays an error message, either **Analysis Toolpak Absent** or **Add-in Absent**. In this case, you need to install the Analysis Toolpak: from the **Tools** menu, select **Add-Ins**. Excel will display the **Add-Ins** dialog box. Check **Analysis Toolpak**. The program will then be able to run the **Quantity Model**.*

The Quantity Model uses the Choice Model's output as its input. It uses the quantity of the product each customer consumed and the retailer's promotional activities as its inputs. The Quantity Model calculates the responsiveness of the quantity each customer consumes as a function of several variables (e.g., regular list price and excess inventory at the consumer's home).

The Quantity Model output looks like this:

Massmart

	A	B	C	D	E	F	G
2	PROMOTIONAL SPENDING ANALYSIS						
3	Which and How Much?						
5	Case Name: MassMart						
6	Quantity Model		Coefficients	1.36	-0.12	1.21	-0.15
7			T-Stats	1.42	-0.40	3.71	-2.49
8	Customer	Month	Quantity	Constant	List Price	Discount	Lag-Inv
9	1	1	1	1	3.30	0.82	1.00
10		2	1	1	2.95	0.60	0.71
11		3	1	1	2.90	0.42	0.43
12		4	1	1	3.30	0.26	0.14
13		5	3	1	3.05	0.70	0.00
14		6	1	1	2.99	0.43	1.71
15		7	1	1	3.38	0.49	1.43
16		8	1	1	2.91	0.45	1.14
17		9	1	1	2.99	0.30	0.85
18		10	2	1	2.95	0.70	0.56
19	2	1	1	1	3.10	0.49	1.28
20		2	1	1	2.95	0.20	0.99
21		3	2	1	3.15	0.41	0.70
22		4	1	1	3.40	0.29	1.41
23		5	1	1	3.21	0.17	1.13

wshQuantity

PROMOTION MODEL

Using the Promotion Model, you can develop recommendations for the promotional activities of a retail outlet. It allows you to:

- Select the brands for which it is profitable to run promotional activities, and
- Select the ideal promotional vehicles (discount, displays, or features) for each brand.

From the **Model** menu, select **Main Menu** then select **Promotion Model**. Click **OK**. The Promotion Model's analysis area will be displayed:

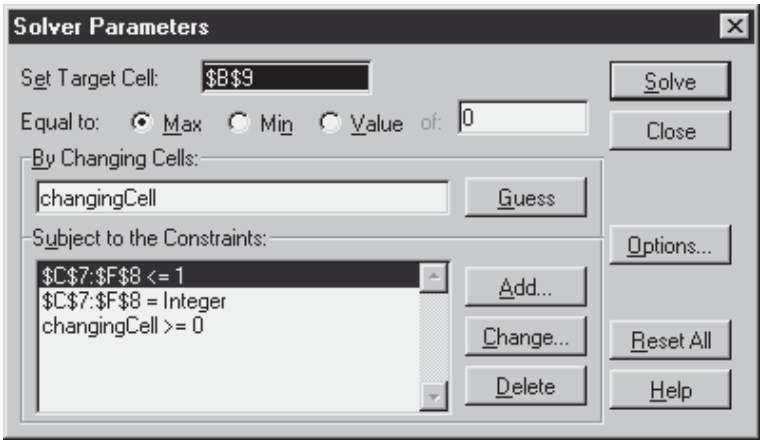
Massmart

	A	B	C	D	E	F
2	PROMOTIONAL SPENDING ANALYSIS					
3	Which and How Much?					
5	Case Name: MassMart					
6	Promotion Model	Discount	$0.22	$0.00	$0.00	$0.00
7		Display	1	0	0	0
8		Feature	1	0	0	0
9	Total Profit	$3,583	Wisk	All	Tide	Yes
10	Average Inventory		1.47	1.47	1.47	1.47
11	Average Loyalty		0.17	0.21	0.45	0.17
12	Average List Price		$3.21	$3.17	$3.40	$3.11
13	Choice Probability		0.95	0.01	0.03	0.01
14	Profit Margin (of List Price)		30%	20%	20%	20%
15	Estimated Monthly Demand	5028	4839	48	100	41
16	Revenue		$3,609	$31	$68	$25
17	Promotion Cost		$150	$0	$0	$0
18	Profit		$3,459	$31	$68	$25
19	Display Cost	100				
20	Feature Cost	50				
21	Number of Households	5000				
22						
23						
24						
25						
26						

wshDecision

You can use Excel's Solver tool to select a set of promotional activities to maximize Total Profit.

1. From the **Tools** menu, select **Solver** to see the **Solver Parameters** dialog box, which looks like this:



2. In the **Set Target Cell** area, enter the cell number that contains the Total Profit amount (e.g., $B$9).

3. In the **By Changing Cells** area, enter the range of cells that contain the amount of discount and the display and feature variables (e.g., $C$6:$F$8).

4. In the **Subject to Constraints** area, enter constraints that ensure that

   - the display and feature variables are equal to either 1 or 0, and
   - the discount amounts are greater than or equal to 0.

   The following equations are just one way of achieving the above constraints:

   $C$7:$F$8 < = 1
   $C$7:$F$8 = Integer
   $C$6:$F$8 > = 0

5. Click **Solve**. The Promotion Model displays the optimal promotional activities to maximize the retailer's total profit.

6. Use Solver in a similar manner to answer the questions at the end of the MassMart case.