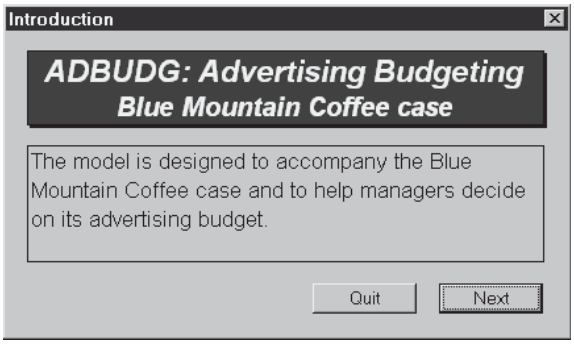
16. TUTORIAL FOR ADBUDG ADVERTISING BUDGETING (adbudg.xls)

CASE: BLUE MOUNTAIN COFFEE CASE, P. 336

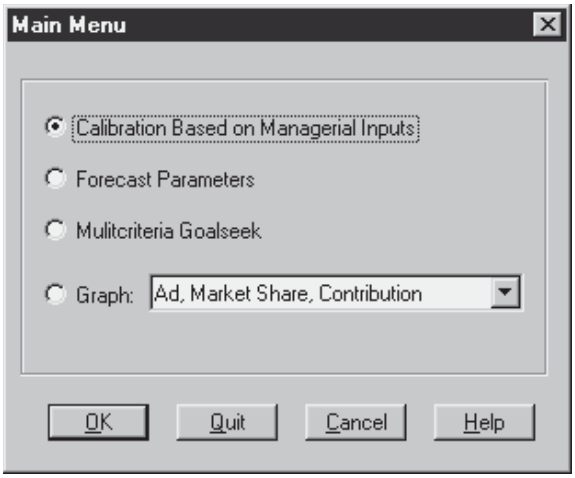
ADBUDG is an advertising sales response model developed by Little (1970) that uses judgmental inputs on market response to determine the best level and timing of advertising expenditures. This implementation of ADBUDG is designed to accompany the Blue Mountain Coffee case.

On the **Model** menu, select **ADBUDG: Advertising Budgeting** to see the **Introduction** screen**.**



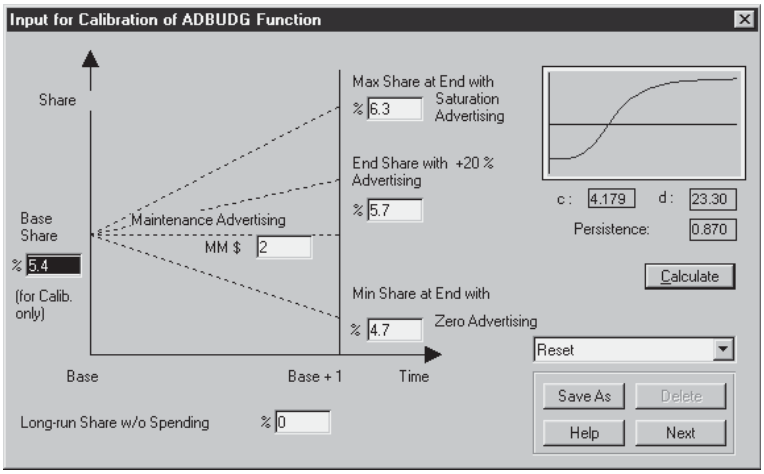
Click **Next** to bring up the **Main Menu**.

First choose **Calibration Based on Managerial Inputs** to calibrate parameter values for the ADBUDG Model and then press **OK**.

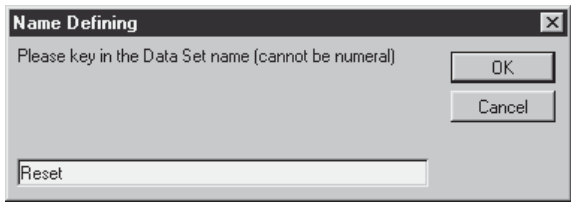


Provide the six input values for calibrating the response model. Then click **Calculate** to see the estimated parameters of the response function (c, d, and "Persistence"). The response curve changes as you change your input values.

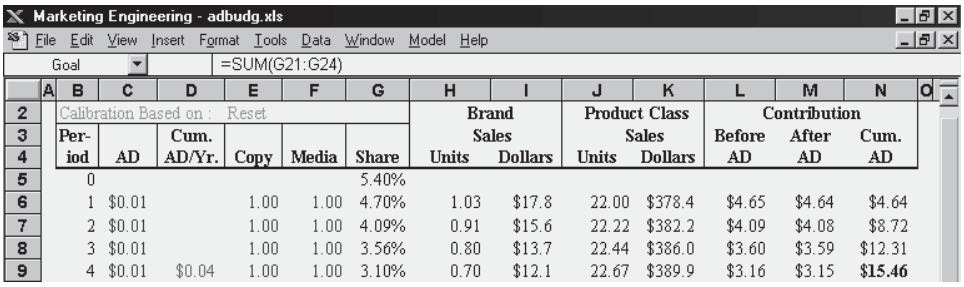
* Tutorial 16, June 2005



Whenever you have a set of inputs that you want to retrieve later, you can save them by clicking **Save As** and providing a name for the selected inputs.



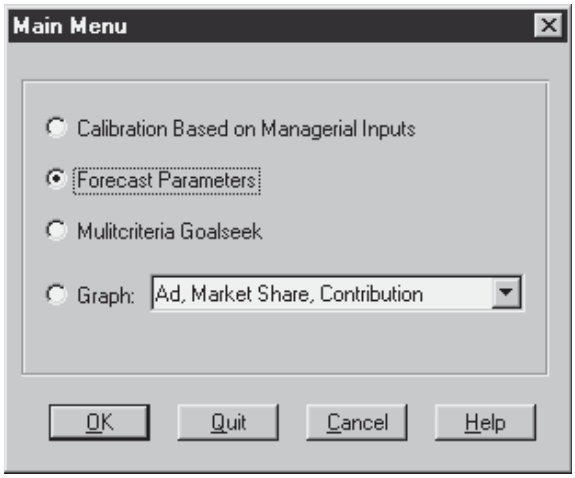
Once you have saved and named a set of inputs and the corresponding coefficient estimates, you can activate it by marking it in the drop-down menu (e.g., "Reset," as shown in the above example). Notice that the name of the data set for the current calibration will then be shown in the left hand corner of the main sheet.



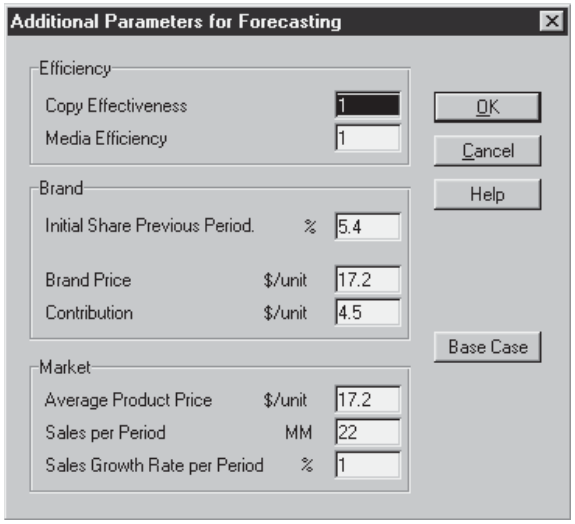
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2		Calibration Based on : Reset						Brand Sales		Product Class Sales		Contribution			
3		Per-		Cum.											
4		iod	AD	AD/Yr.	Copy	Media	Share	Units	Dollars	Units	Dollars	Before AD	After AD	Cum. AD	
5		0					5.40%								
6		1	$0.01		1.00	1.00	4.70%	1.03	$17.8	22.00	$378.4	$4.65	$4.64	$4.64	
7		2	$0.01		1.00	1.00	4.09%	0.91	$15.6	22.22	$382.2	$4.09	$4.08	$8.72	
8		3	$0.01		1.00	1.00	3.56%	0.80	$13.7	22.44	$386.0	$3.60	$3.59	$12.31	
9		4	$0.01	$0.04	1.00	1.00	3.10%	0.70	$12.1	22.67	$389.9	$3.16	$3.15	**$15.46**	

When you have finished the model calibration, click **Next** to get back to the main worksheet.

Next, on the **Model** menu, click **Main Menu**, choose **Forecast Parameters**, and click **OK**.



Use the dialog box to set the parameters for the forecasting task. Except for "Initial Share Previous Period," the parameter values will apply to all twelve periods. If your values for "Copy Effectiveness" and "Media Efficiency" vary over time, you have to enter values for each period directly on the spreadsheet.



Click **Base Case** to restore the parameter values built into the ADBUDG spreadsheet.

Once you have entered all the data relevant to deciding the advertising budget, you can experiment by entering different values for each period and observing the effects on market share and profit. To try out alternative advertising plans, enter these values directly on the sheet in the blue-colored columns. The table will then show how changes in such variables as advertising expense ("AD") and copy efficiency ("Copy") affect market share ("Share") and profit contribution ("Contribution") over time.

For instance in the partial screen shown, advertising expenditure ("AD") increases in the third period whereas "Media" (media efficiency) and "Copy" (copy effectiveness) drop, mitigating the effect of the increase in market share for this period.

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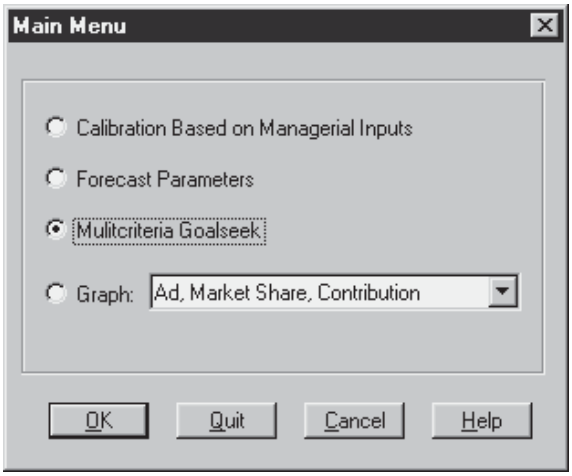
G22

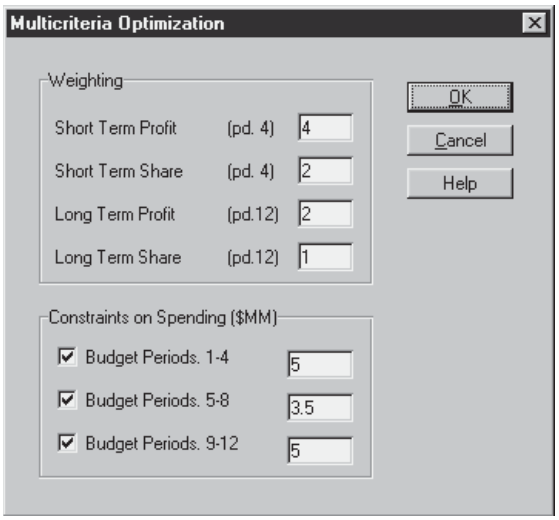
	A	B	C	D	E	F	G	H	I
2		Calibration Based on : Reset						Brand Sales	
3		Per-		Cum.					
4		iod	AD	AD/Yr.	Copy	Media	Share	Units	Dollars
5		0					5.40%		
6		1	$2.00		1.00	1.00	5.40%	1.19	$20.4
7		2	$2.00		1.00	1.00	5.40%	1.20	$20.6
8		3	$2.50		0.90	0.95	5.51%	1.24	$21.3
9		4	$2.00	$8.50	1.00	1.00	5.50%	1.25	$21.4

Built into the ADBUDG spreadsheet is a Multicriteria Goalseek feature. On the **Model** menu, choose **Main Menu** and then click **Multicriteria Goalseek**. This feature uses Excel's Solver tool to help you decide the advertising budget.



You can set the goal criterion by providing decision weights for the short-term (four periods) and long-term (twelve periods) market share and cumulative profit. Solver will then try to optimize the advertising budget subject to the constraints you impose on the yearly (four periods) budgets.

Weights can be any value. Their relative values are what count. For example in the picture short-term profit ("4") is twice as important as short-term share. You can give a weight of 0 to objectives that are irrelevant in a specific decision situation.



The information you provide is then passed into the worksheet. The objective function for the optimization procedure as implemented in ADBUDG is of a simple additive functional form—it is just one example of how to deal with multiple objectives. In this implementation the criteria (that is, profit and market share) are measured on different scales and have to be normalized before optimization. We do this by computing a scaled value for each criterion. We have chosen the scaling factor arbitrarily such that the scaled values for all of the criteria will be equal to 1.0 if the company freezes the advertising budget at the maintenance level of $2M.

***Note**: Higher values of goals are more valuable than lower values. Clearly there are other ways to specify the multicriteria objective function.*

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Goal =SUM(G21:G24)

							Brand Sales		Product Class Sales		Contribution		
Period	AD	Cum. AD/Yr.	Copy	Media	Share	Units	Dollars	Units	Dollars	Before AD	After AD	Cum. AD
0					5.40%							
1	$0.01		1.00	1.00	4.70%	1.03	$17.8	22.00	$378.4	$4.65	$4.64	$4.64
2	$0.01		1.00	1.00	4.09%	0.91	$15.6	22.22	$382.2	$4.09	$4.08	$8.72
3	$0.01		1.00	1.00	3.56%	0.80	$13.7	22.44	$386.0	$3.60	$3.59	$12.31
4	$0.01	$0.04	1.00	1.00	3.10%	0.70	$12.1	22.67	$389.9	$3.16	$3.15	**$15.46**
5	$0.01		1.00	1.00	2.70%	0.62	$10.6	22.89	$393.8	$2.78	$2.77	$18.23
6	$0.01		1.00	1.00	2.35%	0.54	$9.3	23.12	$397.7	$2.44	$2.43	$20.66
7	$0.01		1.00	1.00	2.04%	0.48	$8.2	23.35	$401.7	$2.15	$2.14	$22.80
8	$0.01	$0.04	1.00	1.00	1.78%	0.42	$7.2	23.59	$405.7	$1.89	$1.88	$24.68
9	$0.01		1.00	1.00	1.55%	0.37	$6.3	23.82	$409.8	$1.66	$1.65	$26.33
10	$0.01		1.00	1.00	1.35%	0.32	$5.6	24.06	$413.9	$1.46	$1.45	$27.77
11	$0.01		1.00	1.00	1.17%	0.28	$4.9	24.30	$418.0	$1.28	$1.27	$29.05
12	$0.01	$0.04	1.00	1.00	1.02%	0.25	$4.3	24.54	$422.2	$1.13	$1.12	**$30.16**

Note: All $ are in millions.

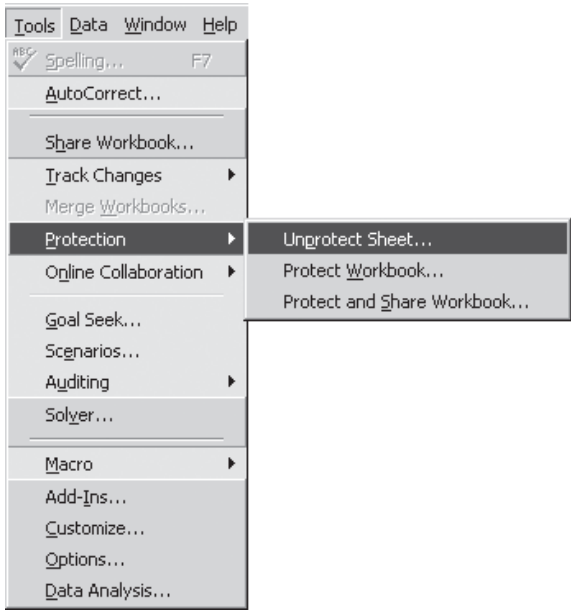
MULTICRITERIA GOALSEEK	Weights	Scaled Values	Weighted Values	GOAL	Subject to Constraints	
Short Term Profit	4	1.12789	4.51157	7.22563		
Short Term Share	2	0.57387	1.14775		AD Budget 1st Year	5
Longterm Profit	2	0.68866	1.37732		AD Budget 2nd Year	3.5
Longterm Share	1	0.18899	0.18899		AD Budget 3rd Year	5

wshData

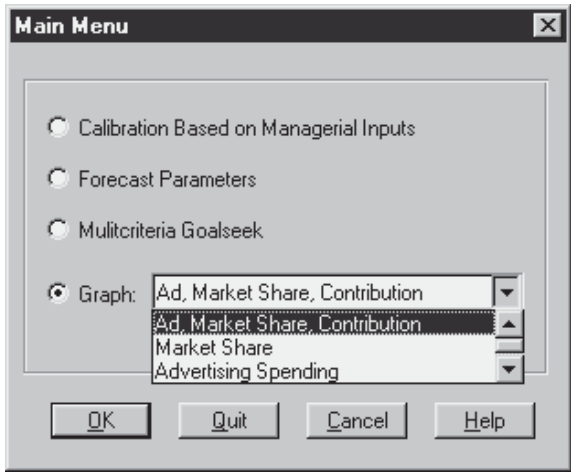
Ready Sum=7.22563

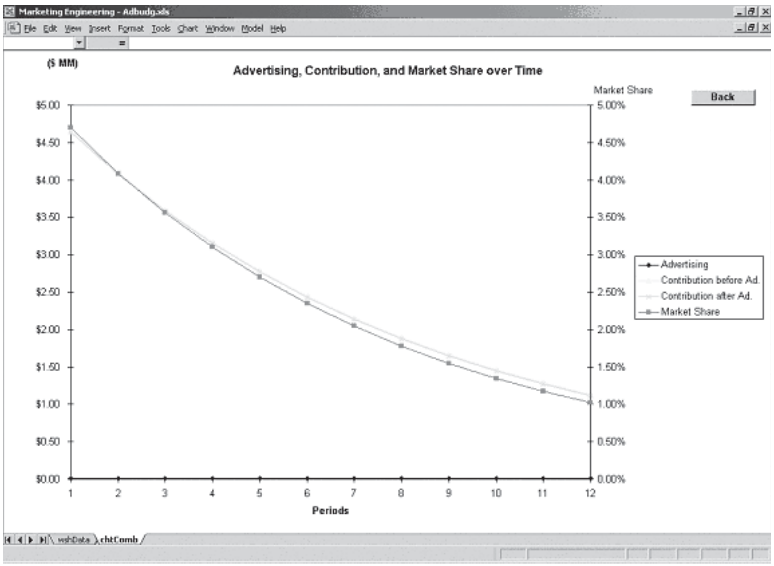
Sometimes the optimization procedure produces an apparently suboptimal solution for allocating the advertising budget over time, Solver may have settled on a local maximum. In other cases, running Solver may not lead to convergence at all. You may sometimes obtain a (better) new result by providing different starting values for the advertising expenditures in each period. Please see the appendix to Chapter 2 in the text.

If you want to conduct additional analyses with Solver directly on the main worksheet, you must first unprotect the spreadsheet: on the **Tools** menu select **Protection** and then **Unprotect Sheet**.



Go to the **Model** menu, choose **Main Menu**, select **Graph,** and click **OK** to view a chart showing your advertising plan and its impact on market share and contribution.





REFERENCE

Little, John D. C. 1970, "Models and managers: The concept of a decision calculus," *Management Science*, Vol. 16, No. 8, pp. B466-B485.