Some Useful Excel Functions for Modeling

SUM and SUMPRODUCT

IF and COUNTIF

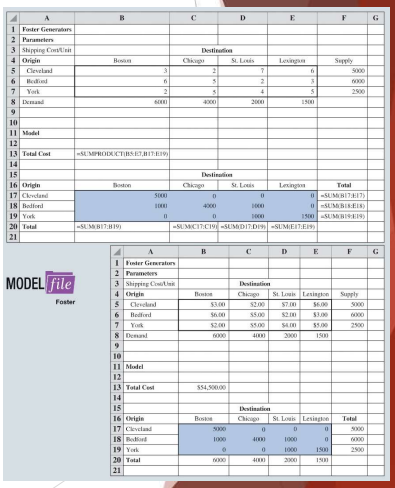
VLOOKUP

Some Useful Excel Functions for Modeling

- **Additional Functions:**
  - SUM:
    - Function that adds up all of the numbers in a range of cells.
    - =SUM(*range)*
  - SUMPRODUCT:
    - Function that returns the sum of the products of elements in a set of arrays.
    - =SUMPRODUCT(*array1, array2)*

Some Useful Excel Functions for Modeling

Figure 10.16: What-If Model for Foster Generators



	A	B	C	D	E	F	G
1	**Foster Generators**						
2	**Parameters**						
3	Shipping Cost/Unit			**Destination**			
4	**Origin**	Boston	Chicago	St. Louis	Lexington	Supply	
5	Cleveland	3	2	7	6	5000	
6	Bedford	6	5	2	3	6000	
7	York	2	5	4	5	2500	
8	Demand	6000	4000	2000	1500		
9							
10							
11	**Model**						
12							
13	**Total Cost**	=SUMPRODUCT(B5:E7,B17:E19)					
14							
15				**Destination**			
16	**Origin**	Boston	Chicago	St. Louis	Lexington	**Total**	
17	Cleveland	5000	0	0	0	=SUM(B17:E17)	
18	Bedford	1000	4000	1000	0	=SUM(B18:E18)	
19	York	0	0	1000	1500	=SUM(B19:E19)	
20	**Total**	=SUM(B17:B19)	=SUM(C17:C19)	=SUM(D17:D19)	=SUM(E17:E19)		
21							

MODEL file
Foster

	A	B	C	D	E	F	G
1	**Foster Generators**						
2	**Parameters**						
3	Shipping Cost/Unit			**Destination**			
4	**Origin**	Boston	Chicago	St. Louis	Lexington	Supply	
5	Cleveland	$3.00	$2.00	$7.00	$6.00	5000	
6	Bedford	$6.00	$5.00	$2.00	$3.00	6000	
7	York	$2.00	$5.00	$4.00	$5.00	2500	
8	Demand	6000	4000	2000	1500		
9							
10							
11	**Model**						
12							
13	**Total Cost**	$54,500.00					
14							
15				**Destination**			
16	**Origin**	Boston	Chicago	St. Louis	Lexington	**Total**	
17	Cleveland	5000	0	0	0	5000	
18	Bedford	1000	4000	1000	0	6000	
19	York	0	0	1000	1500	2500	
20	**Total**	6000	4000	2000	1500		
21							

- Each element of one array is multiplied by corresponding element of the other array

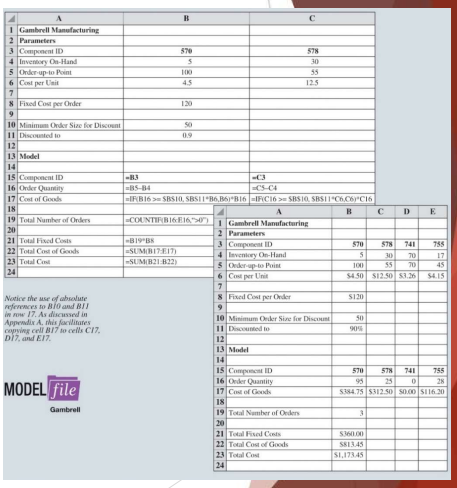
B5*B17+C5*C17 + D5*D17 + E5*E17 +B6*B18 +…+ E7*E9

Some Useful Excel Functions for Modeling

- **Additional Functions:**
- =IF(condition, result if condition is true, result if condition is false).
  - =IF(B16>=$B$10, $B$11*B6, B6)*B16
- =COUNTIF(range, condition).
  - Counts the number of components having a positive order quantity.
    - =COUNTIF(B16:E16, “>0”)

Some Useful Excel Functions for Modeling

Figure 10.17: Gambrell Manufacturing Component Ordering Model



	A	B	C
1	**Gambrell Manufacturing**		
2	**Parameters**		
3	Component ID	**570**	**578**
4	Inventory On-Hand	5	30
5	Order-up-to Point	100	55
6	Cost per Unit	4.5	12.5
7			
8	Fixed Cost per Order	120	
9			
10	Minimum Order Size for Discount	50	
11	Discounted to	0.9	
12			
13	**Model**		
14			
15	Component ID	**=B3**	**=C3**
16	Order Quantity	=B5–B4	=C5–C4
17	Cost of Goods	=IF(B16 >= $B$10, $B$11*B6,B6)*B16	=IF(C16 >= $B$10, $B$11*C6,C6)*C16
18			
19	Total Number of Orders	=COUNTIF(B16:E16,">0")	
20			
21	Total Fixed Costs	=B19*B8	
22	Total Cost of Goods	=SUM(B17:E17)	
23	Total Cost	=SUM(B21:B22)	
24			

Notice the use of absolute references to B10 and B11 in row 17. As discussed in Appendix A, this facilitates copying cell B17 to cells C17, D17, and E17.

MODEL *file*
Gambrell

	A	B	C	D	E
1	**Gambrell Manufacturing**				
2	**Parameters**				
3	Component ID	**570**	**578**	**741**	**755**
4	Inventory On-Hand	5	30	70	17
5	Order-up-to Point	100	55	70	45
6	Cost per Unit	$4.50	$12.50	$3.26	$4.15
7					
8	Fixed Cost per Order	$120			
9					
10	Minimum Order Size for Discount	50			
11	Discounted to	90%			
12					
13	**Model**				
14					
15	Component ID	**570**	**578**	**741**	**755**
16	Order Quantity	95	25	0	28
17	Cost of Goods	$384.75	$312.50	$0.00	$116.20
18					
19	Total Number of Orders	3			
20					
21	Total Fixed Costs	$360.00			
22	Total Cost of Goods	$813.45			
23	Total Cost	$1,173.45			
24					

- Illustration:
  - Gambrell Manufacturing produces car stereos.
  - Gambrell likes to keep its components inventory to a minimum.
    - Hence, it uses an inventory policy known as an order-up-to policy.
      - Whenever the inventory on hand drops below a certain level, enough units are ordered to return the inventory to that predetermined level.

Some Useful Excel Functions for Modeling

- **VLOOKUP**
  - This function allows the user to pull a subset of data from a larger table of data based on some criterion.
- General form =VLOOKUP(value, table, index, range) where,
  - value = the value to search for in the **FIRST** column of the table.
  - table = the cell range containing the table.
  - index = the column in the table containing the value to be returned.
  - range = TRUE if looking for the first approximate match of value
    - FALSE if looking for an exact match of value.

Some Useful Excel Functions for Modeling

Figure 10.18: Granite Insurance Bonus Model

	A	B	C	D	E
1	**Granite Insurance Bonus Awards**				
2					
3	**Parameters**			Bonus Pool	250000
4					
5	Bonus Bands to be awarded for percentage above target sales.				
6	**Lower Limit**	**Upper Limit**	**Bonus Points**		
7	0	0.1	0		
8	0.11	0.5	10		
9	0.51	0.79	15		
10	0.8	0.99	25		
11	1	100	40		
12					
13	**Model**				
14	**Last Name**	**% Above Target Sales**	**Bonus Points**	**% of Pool**	**Bonus Amount**
15	Barth	0.83	=VLOOKUP(B15,$A$7:$C$11,3,TRUE)	=C15/$C$30	=D15*$E$3
16	Benson	0	=VLOOKUP(B16,$A$7:$C$11,3,TRUE)	=C16/$C$30	=D16*$E$3
17	Capel	1.18	=VLOOKUP(B17,$A$7:$C$11,3,TRUE)	=C17/$C$30	=D17*$E$3
18	Choi	0.44	=VLOOKUP(B18,$A$7:$C$11,3,TRUE)	=C18/$C$30	=D18*$E$3
29	Ruebush	0.85	=VLOOKUP(B29,$A$7:$C$11,3,TRUE)	=C29/$C$30	=D29*$E$3
30		Total	=SUM(C15:C29)	=SUM(D15:D29)	=SUM(E15:E29)

MODEL file
Granite

	A	B	C	D	E
1	**Granite Insurance Bonus Awards**				
2					
3	**Parameters**			Bonus Pool	$250,000
4					
5	Bonus Bands to be awarded for percentage above target sales.				
6	**Lower Limit**	**Upper Limit**	**Bonus Points**		
7	0%	10%	0		
8	11%	50%	10		
9	51%	79%	15		
10	80%	99%	25		
11	100%	100000%	40		
12					
13	**Model**				
14	**Last Name**	**% Above Target Sales**	**Bonus Points**	**% of Pool**	**Bonus Amount**
15	Barth	83%	25	8.5%	$21,186.44
16	Benson	0%	0	0.0%	$0.00
17	Capel	118%	40	13.6%	$33,898.31
18	Choi	44%	10	3.4%	$8,474.58
29	Ruebush	85%	25	8.5%	$21,186.44
30		Total	295	100%	$250,000.00