

Table 8.32 Constraint Coefficients for Multidivisional Problems

<i>Coefficients of Decision Variables for</i>			
<i>1st Division</i>	<i>2nd Division</i>	<i>...</i>	<i>Last Division</i>
.....	<i>Constraints on resources needed by divisions</i>
.....	
.....			<i>Constraints on resources available only to 1st division</i>
.....			
		<i>Constraints on resources available only to 2nd division</i>
		
			<i>Constraints on resources available only to last division</i>

Multidivisional - Prototype Example (p. 347-349)

$$\text{Max } Z = 8x_1 + 5x_2 + 6x_3 + 9x_4 + 7x_5 + 9x_6 + 6x_7 + 5x_8$$

s.t.

5x ₁	+ 3x ₂		+ 2x ₄		+ 3x ₆	+ 4x ₇	+ 6x ₈	≤	30	<i>[corn]</i>
2x ₁		+ 4x ₃	+ 3x ₄	+ 7x ₅		+ x ₇		≤	20	<i>[potatoes]</i>
2x ₁	+ 4x ₂	+ 3x ₃						≤	10	<i>[resource 1]</i>
7x ₁	+ 3x ₂	+ 6x ₃						≤	15	<i>[resource 2]</i>
5x ₁	+ 3x ₃							≤	12	<i>[resource 3]</i>
			3x ₄	+ x ₅	+ 2x ₆			≤	7	<i>[resource 4]</i>
			2x ₄	+ 4x ₅	+ 3x ₆			≤	9	<i>[resource 5]</i>
						8x ₇	+ 5x ₈	≤	25	<i>[resource 6]</i>
						7x ₇	+ 9x ₈	≤	30	<i>[resource 7]</i>
						6x ₇	+ 4x ₈	≤	20	<i>[resource 8]</i>

and

$$x_j \geq 0 \text{ for } j = 1, 2, \dots, 8$$

Solution:

Z = 66.51	x ₁ = 0	x ₂ = 1	x ₃ = 2	x ₄ = 0.6
	x ₅ = 0	x ₆ = 2.6	x ₇ = 2.14	x ₈ = 1.57

Table 8.36 Constraint Coefficients for Multitime Period Problems

Coefficients of Activity Variables for				
<i>1st Time</i>		<i>2nd Time</i>		<i>Last Time</i>
<i>Period</i>	<i>Linking</i>	<i>Period</i>	<i>Linking</i>	<i>Period</i>
.....	...			
.....	...			
.....	...			
	...			
	
	
	
	

Constraints on resources available during 1st time period

Constraints on resources available during 2nd time period

Constraints on resources available during last time period

Lumber Price Data for the Woodstock Company

<u>Season</u>	<u>Purchase Price *</u>	<u>Selling Price *</u>	<u>Maximum Sales **</u>
Winter	410	425	1,000
Spring	430	440	1,400
Summer	460	465	2,000
Autumn	450	455	1,600

* *Price are in dollars per thousand board feet.*

** *Sales are in thousand board feet*

If lumber is purchased and stored for later sale:

Handling Cost:

\$7 per 1,000 board feet

Storage Cost:

\$10 per 1,000 board feet per time period (season)

