

Project Planning & Control

Lesson 3

Review Problem -1; Problem -2 (Cash Resource); Resolving Over-Allocation

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Learning Objective

- Review of Resource Allocation (& Over-allocation)
- Ways of using float for resolving over-allocation – (Money as resource)
- Resolving Multi-Resource over-allocation

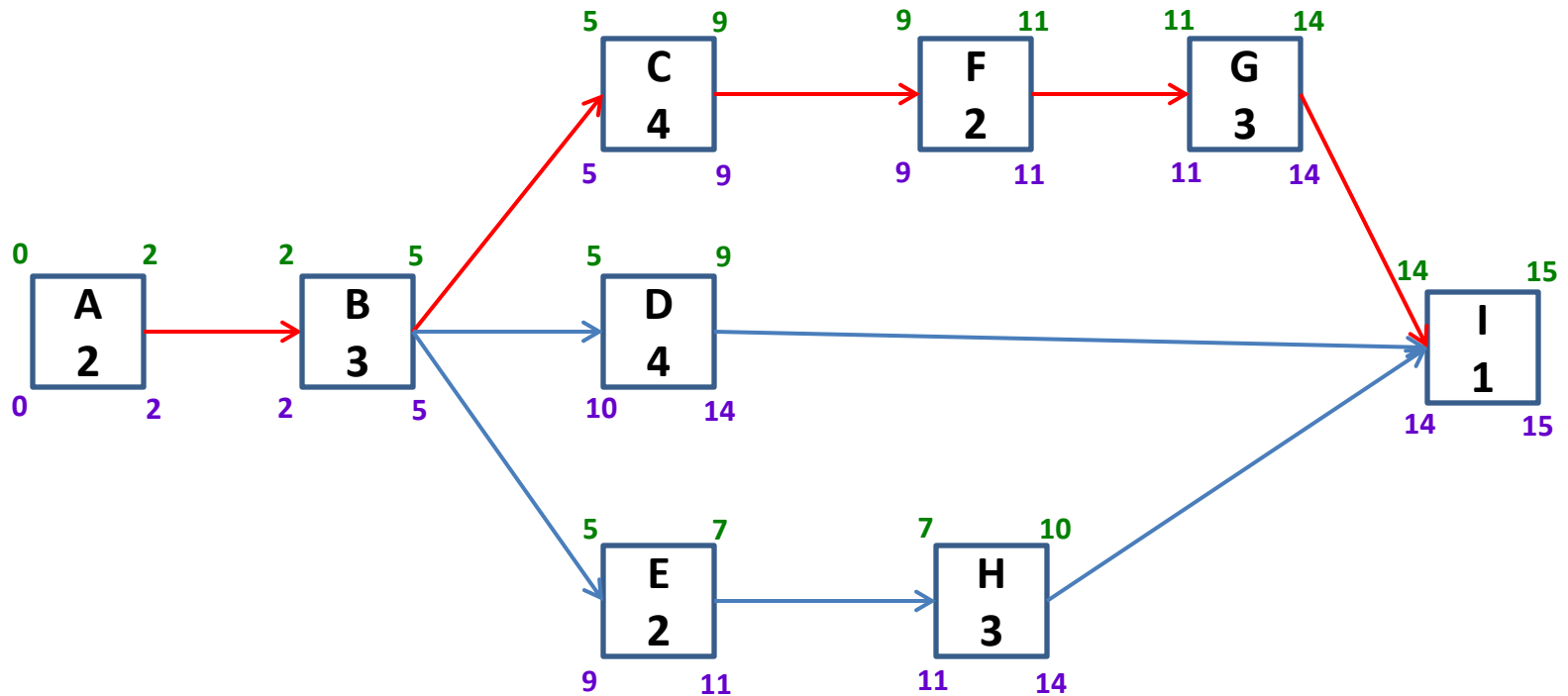
Problem 1

Activity	Preceded by	Duration	Trucks
A	-	2	2
B	A	3	1
C	B	4	6
D	B	4	4
E	B	2	4
F	C	2	2
G	F	3	2
H	E	3	1
I	D,G,H	1	1

Find network parameters and plot resource histogram

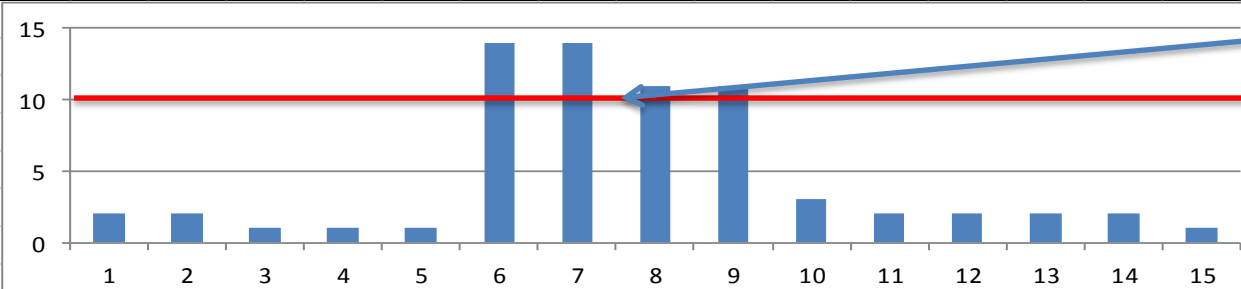
If only 10 trucks are available is this adequate if all activities are at Early Start ?
If not how can over-allocation problem be resolved ?

Problem 1- Network Analysis

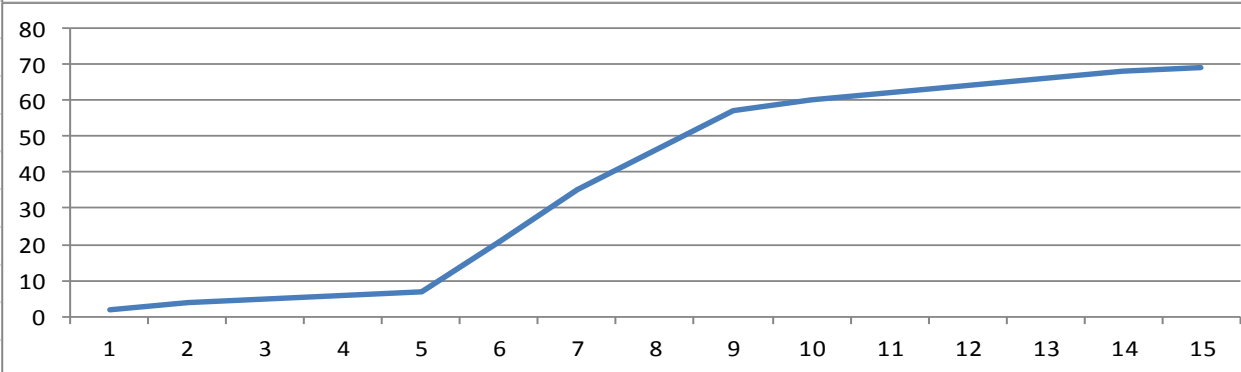


Early Start Schedule

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	2	2													
B			1	1	1										
C						6	6	6	6						
D						4	4	4	4						
E						4	4								
F										2	2				
G												2	2	2	
H								1	1	1					
I															1
Total	2	2	1	1	1	14	14	11	11	3	2	2	2	2	1
Cum	2	4	5	6	7	21	35	46	57	60	62	64	66	68	69



Over-allocation



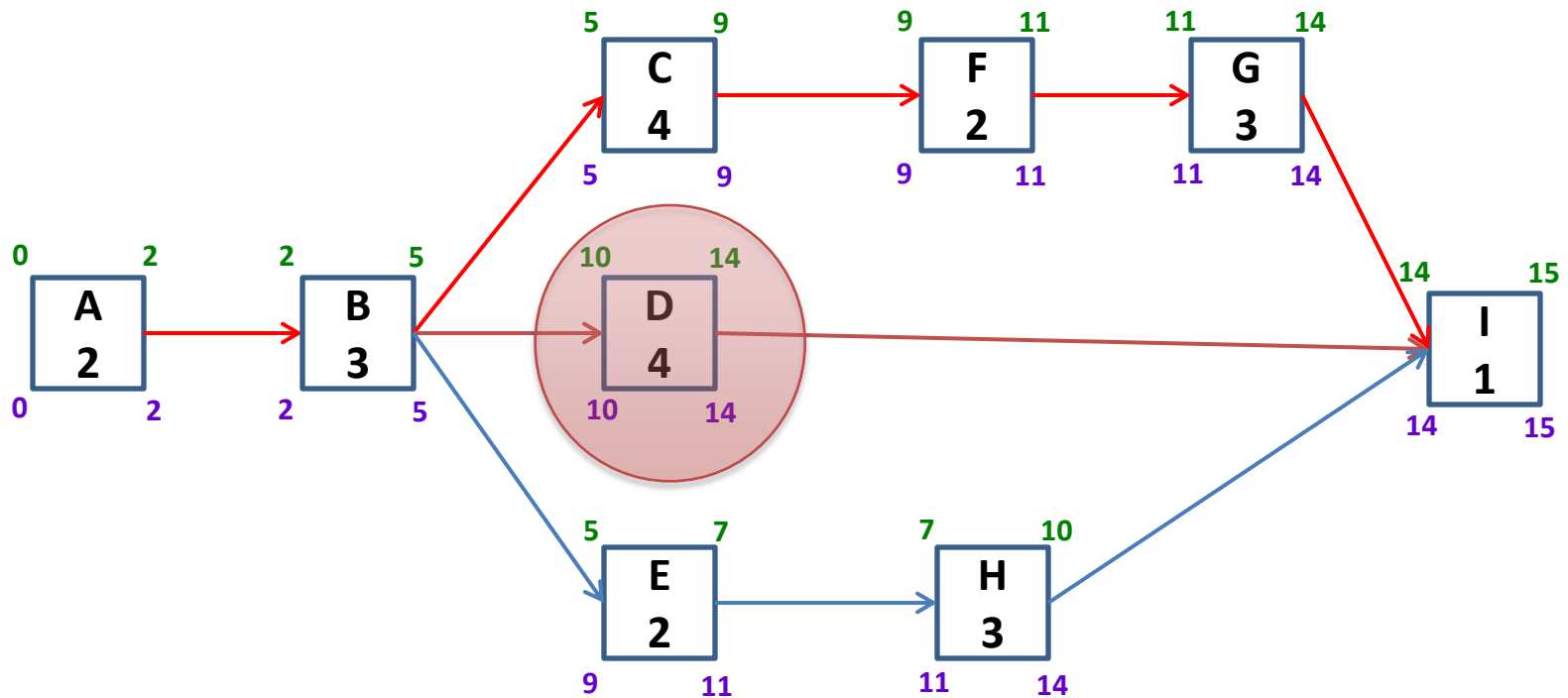
Over-allocation- Resolved

Float of D has been used to resolve over-allocation

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	2	2													
B			1	1	1										
C						6	6	6	6						
D												4	4	4	4
E						4	4								
F										2	2				
G												2	2	2	
H								1	1	1					
I															1
Total Trucks	2	2	1	1	1	10	10	7	7	3	6	6	6	6	1

Network Parameters After Shift of D

Does D need to use all its float ?



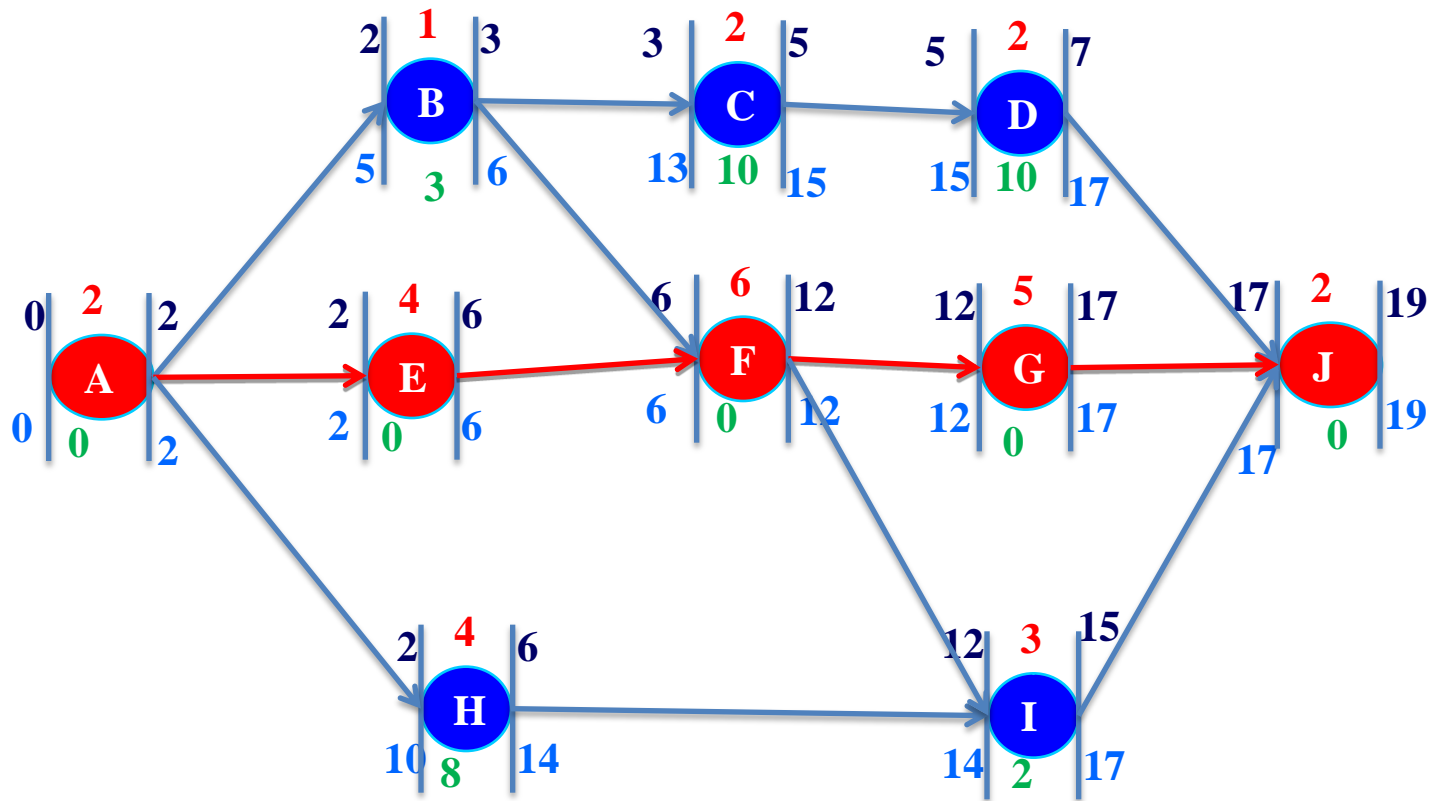
Are any other scenarios possible ?

Problem -2 (Cash Resource)

Activity	Predecessor	Duration in months	Total Value Rs.
A	-	2	45,000
B	A	1	12,000
C	B	2	96,000
D	C	2	115,000
E	A	4	192,000
F	B,E	6	289,200
G	F	5	185,000
H	A	4	144,400
I	H,F	3	72,000
J	D,G,I	2	23,600

- Plot the graphs for monthly and cumulative expenditure – Early Start & Late Start
- What decision making information can you obtain from these graphs ?
- If monthly expenditure is limited to Rs. 100,000 is it adequate ?
- If not, how can it be resolved ?

Problem – 2 Network Analysis



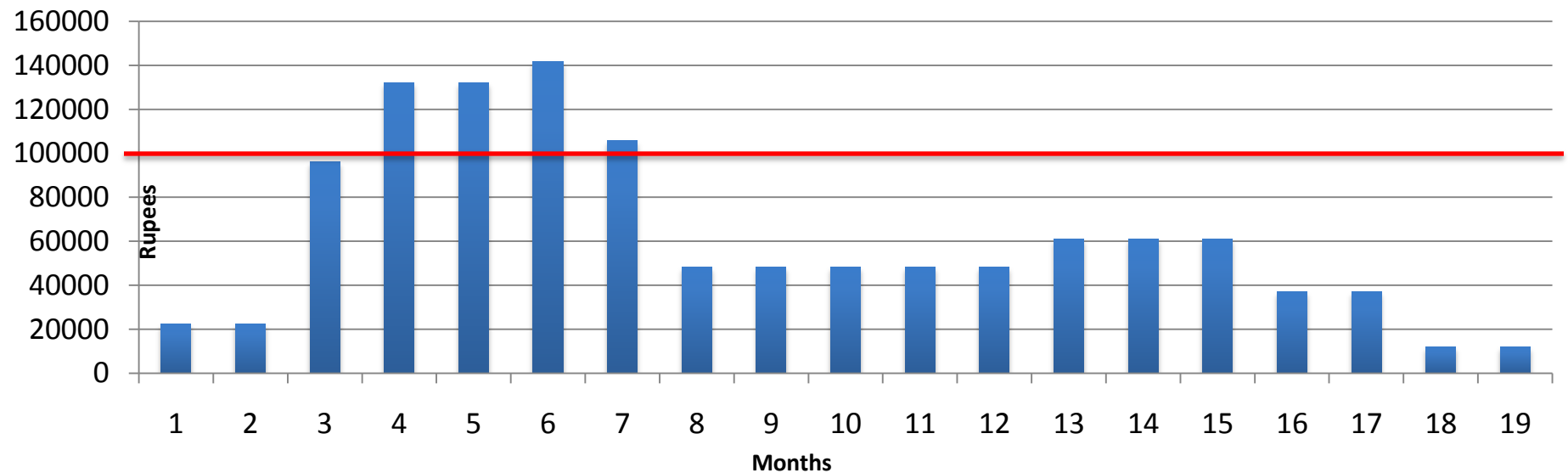
Problem -2

Assume that the Total Value is "EQUALLY" divided for the duration of the activity

Activity	Predecessor	Duration in months	Total Value Rs.	Monthly Value
A	-	2	45000	22500
B	A	1	12000	12000
C	B	2	96000	48000
D	C	2	115000	57500
E	A	4	192000	48000
F	B,E	6	289200	48200
G	F	5	185000	37000
H	A	4	144400	36100
I	H,F	3	72000	24000
J	D,G,I	2	23600	11800

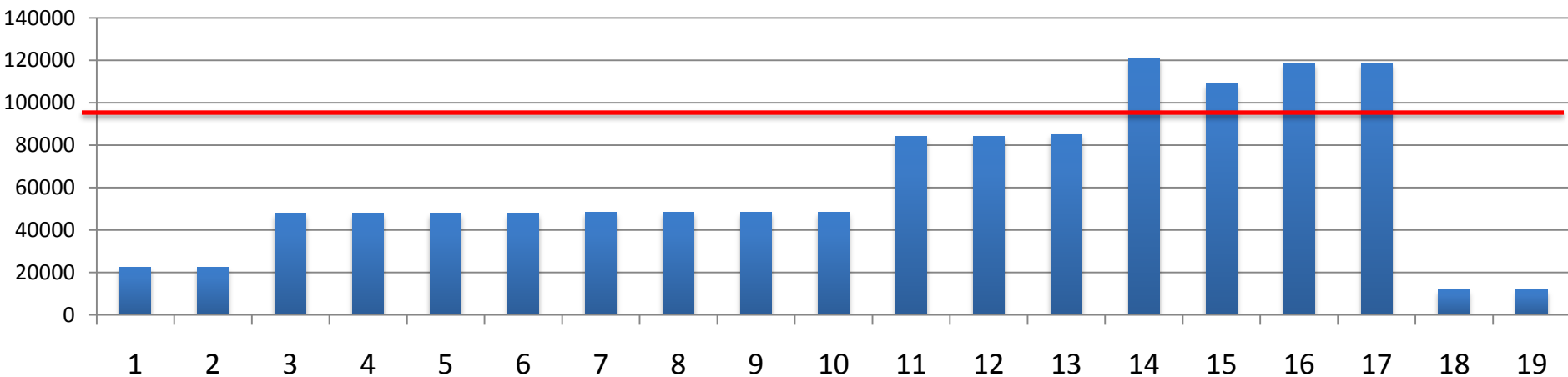
Total Monthly Outflow– Early Start

	Months																		
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	22500	22500																	
B			12000																
C				48000	48000														
D						57500	57500												
E			48000	48000	48000	48000													
F							48200	48200	48200	48200	48200	48200							
G													37000	37000	37000	37000	37000		
H			36100	36100	36100	36100													
I													24000	24000	24000				
j																		11800	11800
Total	22500	22500	96100	132100	132100	141600	105700	48200	48200	48200	48200	48200	61000	61000	61000	37000	37000	11800	11800
Cuml	22500	45000	141100	273200	405300	546900	652600	700800	749000	797200	845400	893600	954600	1015600	1076600	1113600	1150600	1162400	1174200



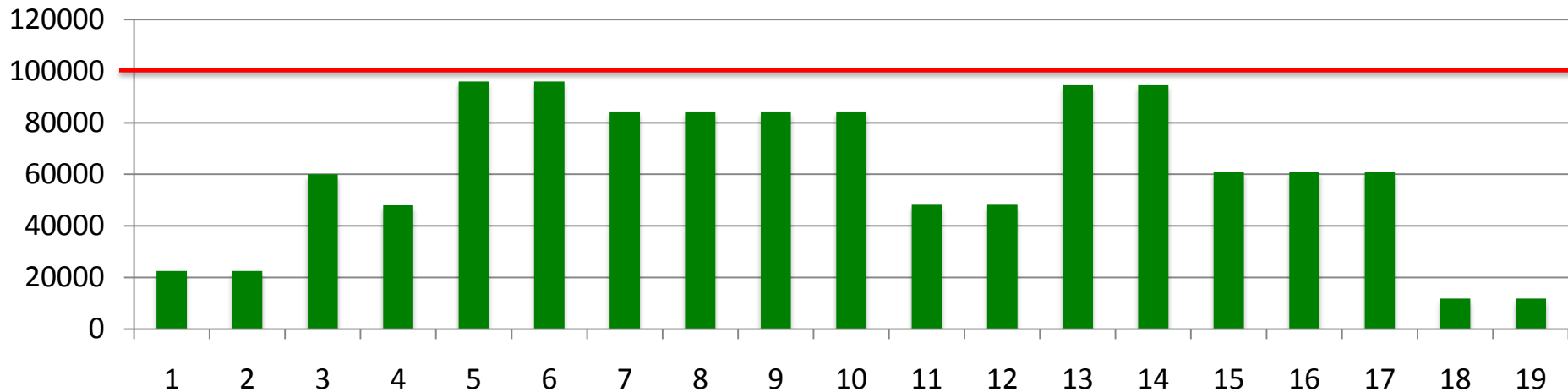
Total Monthly Outflow – Late Start

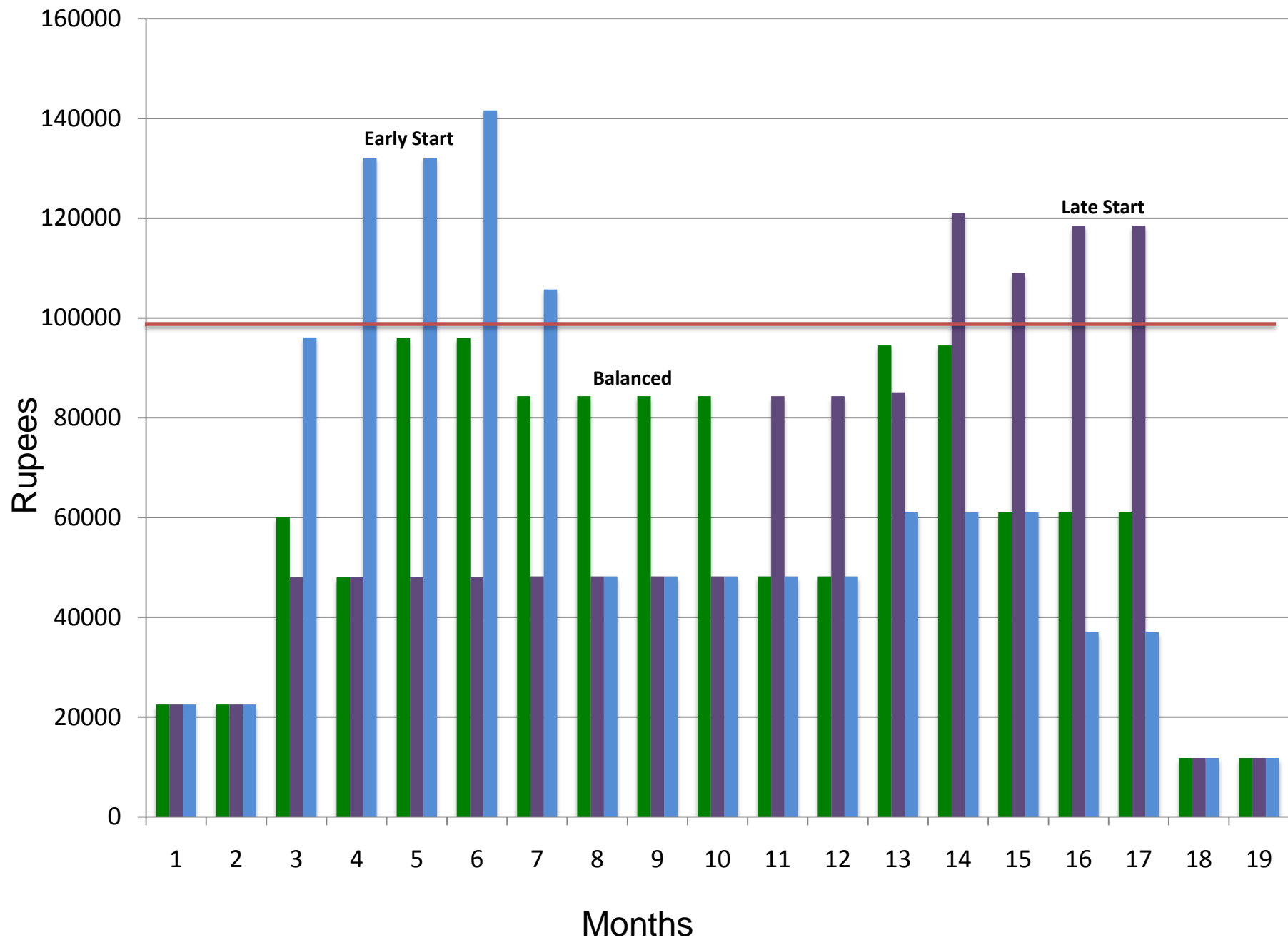
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	22500	22500																	
B													12000						
C														48000	48000				
D																57500	57500		
E			48000	48000	48000	48000													
F							48200	48200	48200	48200	48200	48200							
G													37000	37000	37000	37000	37000		
H											36100	36100	36100	36100					
I															24000	24000	24000		
j																		11800	11800
Total	22500	22500	48000	48000	48000	48000	48200	48200	48200	48200	84300	84300	85100	121100	109000	118500	118500	11800	11800
Cuml	22500	45000	93000	141000	189000	237000	285200	333400	381600	429800	514100	598400	683500	804600	913600	1032100	1150600	1162400	1174200



Resolving Over-Allocation

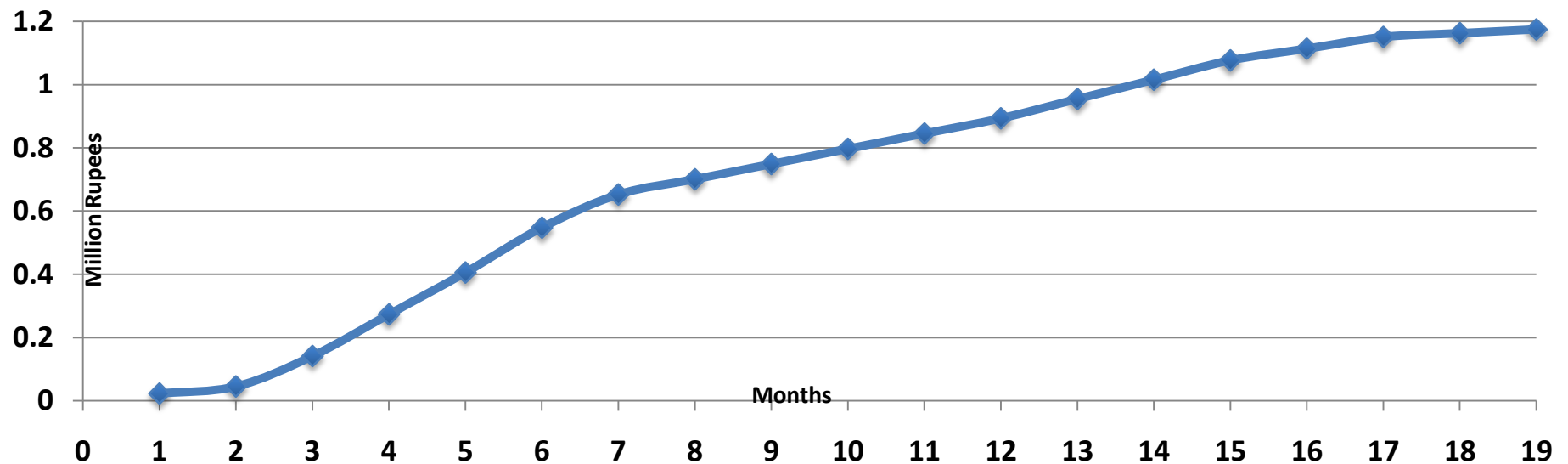
	MONTHS																		
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	22500	22500																	
B			12000																
C				→	48000	48000													
D													57500	57500					
E			48000	48000	48000	48000													
F							48200	48200	48200	48200	48200	48200							
G													37000	37000	37000	37000	37000		
H																			
I																			
J																		11800	11800
Total	22500	22500	60000	48000	96000	96000	84300	84300	84300	84300	48200	48200	94500	94500	61000	61000	61000	11800	11800
Cuml	22500	45000	105000	153000	249000	345000	429300	513600	597900	682200	730400	778600	873100	967600	1028600	1089600	1150600	1162400	1174200





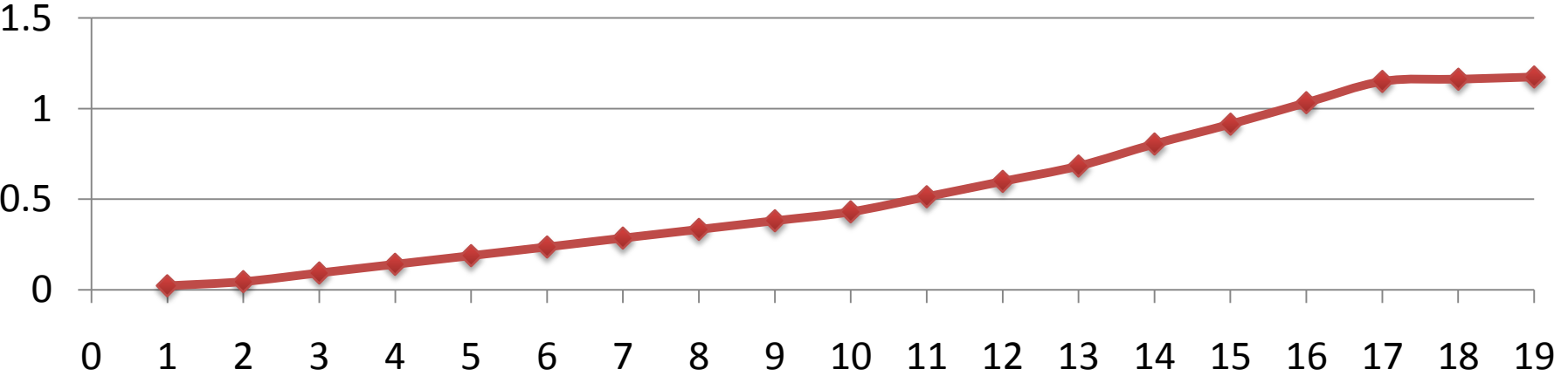
Cumulative – Early Start

Activity	Months																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	22500	22500																	
B			12000																
C				48000	48000														
D						57500	57500												
E			48000	48000	48000	48000													
F							48200	48200	48200	48200	48200	48200							
G													37000	37000	37000	37000	37000		
H			36100	36100	36100	36100													
I													24000	24000	24000				
j																		11800	11800
Total	22500	22500	96100	132100	132100	141600	105700	48200	48200	48200	48200	48200	61000	61000	61000	37000	37000	11800	11800
Cuml	22500	45000	141100	273200	405300	546900	652600	700800	749000	797200	845400	893600	954600	1015600	1076600	1113600	1150600	1162400	1174200



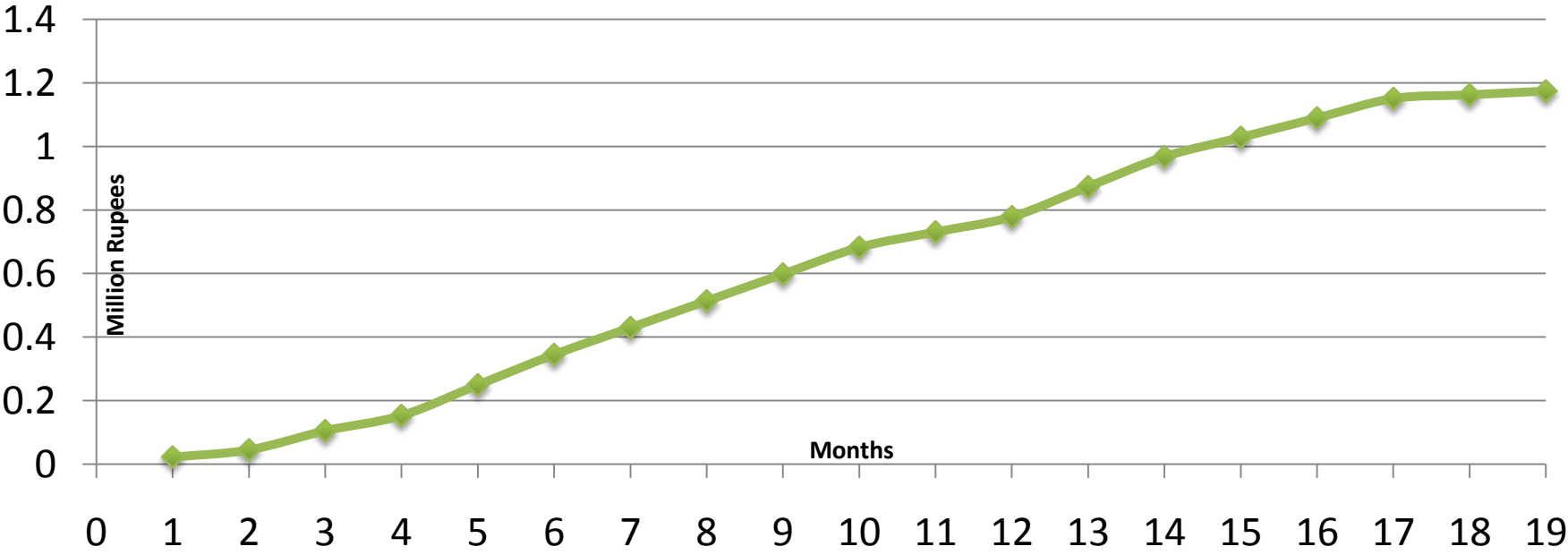
Cumulative – Late Start

		Months																		
Activity		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A		22500	22500																	
B														12000						
C															48000	48000				
D																	57500	57500		
E			48000	48000	48000	48000														
F								48200	48200	48200	48200	48200	48200							
G														37000	37000	37000	37000	37000		
H												36100	36100	36100	36100					
I																24000	24000	24000		
j																			11800	11800
Total		22500	22500	48000	48000	48000	48000	48200	48200	48200	48200	84300	84300	85100	121100	109000	118500	118500	11800	11800
Cuml		22500	45000	93000	141000	189000	237000	285200	333400	381600	429800	514100	598400	683500	804600	913600	1032100	1150600	1162400	1174200



Cumulative - Balanced

Activity	MONTHS																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	22500	22500																	
B			12000																
C					48000	48000													
D													57500	57500					
E			48000	48000	48000	48000													
F							48200	48200	48200	48200	48200	48200							
G													37000	37000	37000	37000	37000		
H							36100	36100	36100	36100									
I															24000	24000	24000		
j																		11800	11800
Total	22500	22500	60000	48000	96000	96000	84300	84300	84300	84300	48200	48200	94500	94500	61000	61000	61000	11800	11800
Cuml	22500	45000	105000	153000	249000	345000	429300	513600	597900	682200	730400	778600	873100	967600	1028600	1089600	1150600	1162400	1174200



Comparison of ES, LS & Balanced Cumulative Cash Flow

