

Cost Allocation Example

Assume the following data:

User Dept	Units of services provided			Costs Prior to Service Department
	S1	S2	S3	\$
S1	0	2,000	4,500	92,400
S2	1,000	0	0	184,800
S3	2,000	4,000	0	138,600
P1	4,000	10,000	1,500	400,000
P2	3,000	4,000	9,000	500,000
Totals	10,000	20,000	15,000	1,315,800

(i) Direct Method allocation to production departments;

	S1	S2	S3	P1	P2
Cost Prior to Allocation	92,400	184,800	138,600	400,000	500,000
Allocate S1(4:3)	(92,400)			52800	39600
Allocate S2 (5:2)		(184,800)		132000	52800
Allocate S3(1 :6)			(138,600)	19800	118800

ii) Step wise method (Elimination Method)

	S1	S2	S3	P1	P2	Total
Cost Prior to Allocation	92,400	184,800	138,600	400,000	500,000	1,315,800
Allocate S1(1:2:4:3)		9,240	18,480	36,960	27,720	
		194,040	157,080	436,960	527,720	
Allocate S2 (2:5:2)		(194,040)	38,808	97,020	58,212	
			195,888	533,980	585,932	
Allocate S3(1 :6)			(195,888)	27,984	167,904	
				561,964	753,836	1,315,800

(iii) Reciprocal Method

Let S_a be the total costs of service dept 1

Let S_b be the total costs of service dept 2

Let S_c be the total costs of service dept 3

Each of the coefficients in the expressions hereunder (used to get cost after recognition) are percentages based on proportional service received by a department from the departments

$$S_a = 92400 + 0.1S_b + 0.30S_c \quad \text{Equation (i)}$$

$$S_b = 184,800 + 0.1S_a \quad \text{Equation (ii)}$$

$$S_c = 138,600 + 0.2S_a + 0.2S_b \quad \text{Equation (iii)}$$

Substituting Equation (ii) into Equation (i) and solving, we get;

$$S_a = 92400 + 0.1(184,800 + 0.1S_a + 0.05S_c) + 0.30S_c \dots \dots \dots \text{Equation (i)}_c$$

$$S_a = 92400 + (18,480 + 0.01S_a) + 0.30S_c$$

$$S_a = 110,880 + 0.1S_a + 0.30S_c$$

$$0.99S_a = 110,880 + 0.30S_c$$

Substituting Equation (ii) into Equation (iii) and solving, we get,

$$S_c = 138,600 + 0.2S_a + 0.2(184,400 + 0.1S_a) \quad \text{Equation (iii)}$$

$$S_c = 138,600 + 0.2S_a + 36,880 + 0.02S_a$$

$$S_c = 175,480 + 0.2S_a + 0.02S_a$$

$$0.98S_c = 175,480 + 0.2S_a \quad \text{Equation (iv)}$$

Substituting (v) into Equation (iv) and solving we get,

$$0.99S_a = 110,880 + 0.30S_c$$

$$0.99S_a = 110,880 + 0.30(175,480 + 0.2S_a)$$

$$0.99S_a = 110,880 + 52,644 + 0.06S_a$$

$$0.99S_a = 163524 + 0.06S_a$$

$$0.93S_a = 163524$$

$$S_a = \underline{163524}$$

$$0.93$$

$$S_a = 175,832$$

Therefore

$$S_b = 184,400 + 0.1(175,832) = 201,983$$

$$S_c = 138,600 + 0.2(175,832) + 0.2(201,983) = 214,163$$

Cost Prior to Allocation	S1	S2	S3	P1	P2	Total
	92,400	184,800	138,600	400,000	500,000	1,315,800
Cost after recognition	175,832	201,983	214,163			
Allocate S1(1:2:4:3)		9,240	18,480	36,960	27,720	
		194,040	157,080	436,960	527,720	
Allocate S2 (2:5:2)		(194,040)	38,808	97,020	58,212	
			195,888	533,980	585,932	
Allocate S3(1 :6)			(195,888)	27,984	167,904	
				561,964	753,836	1,315,800