

**EKLER****EK-1. Her bir kritere göre tedarikçilerin önem ağırlıkları**

		KARAR VERİCİLER						Bulanık Değer		Kesin Değer
		KV 1		KV2		KV3				
C1	S1	0	0	0	0	0	0	0.0000	0.0000	0.1083
		0	0	0.1	0	0.1	0	0.0667	0.0000	
		0	0	0.1	0	0.1	0	0.0667	0.0000	
		0.1	0.5	0.3	0.5	0.3	0.5	0.2333	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0.3	0.4	0.1	0.2	0.1	0.2	0.1667	0.2667	0.3575
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.7	0.6	0.5	0.4	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0.1	0.2	0.3	0.4	0.3	0.4	0.2333	0.3333	0.4225
		0.3	0.3	0.5	0.5	0.5	0.5	0.4333	0.4333	
		0.3	0.3	0.5	0.5	0.5	0.5	0.4333	0.4333	
		0.5	0.4	0.7	0.6	0.7	0.6	0.6333	0.5333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.3	0.4	0.1	0.2	0.3	0.4	0.2333	0.3333	0.4225
		0.5	0.5	0.3	0.3	0.5	0.5	0.4333	0.4333	
		0.5	0.5	0.3	0.3	0.5	0.5	0.4333	0.4333	
		0.7	0.6	0.5	0.4	0.7	0.6	0.6333	0.5333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S5	0.5	0.6	0.7	0.8	0.5	0.6	0.5667	0.6667	0.7413
		0.7	0.7	0.9	0.9	0.7	0.7	0.7667	0.7667	
		0.7	0.7	0.9	0.9	0.7	0.7	0.7667	0.7667	
		0.9	0.8	1	0.95	0.9	0.8	0.9333	0.8500	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	

**EK-1. Devamı**

<b>C2</b>	<b>S1</b>	0.5	0.6	0.5	0.6	0.3	0.4	0.4333	0.5333	0.6175
		0.7	0.7	0.7	0.7	0.5	0.5	0.6333	0.6333	
		0.7	0.7	0.7	0.7	0.5	0.5	0.6333	0.6333	
		0.9	0.8	0.9	0.8	0.7	0.6	0.8333	0.7333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S2</b>	0.5	0.6	0.5	0.6	0.1	0.2	0.3667	0.4667	0.5525
		0.7	0.7	0.7	0.7	0.3	0.3	0.5667	0.5667	
		0.7	0.7	0.7	0.7	0.3	0.3	0.5667	0.5667	
		0.9	0.8	0.9	0.8	0.5	0.4	0.7667	0.6667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S3</b>	0.1	0.2	0.1	0.2	0.1	0.2	0.1000	0.2000	0.2925
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.5	0.4	0.5	0.4	0.5	0.4	0.5000	0.4000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S4</b>	0	0	0	0	0.1	0.2	0.0333	0.0667	0.1808
		0.1	0	0.1	0	0.3	0.3	0.1667	0.1000	
0.1		0	0.1	0	0.3	0.3	0.1667	0.1000		
0.3		0.5	0.3	0.5	0.5	0.4	0.3667	0.4667		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
<b>S5</b>	0.1	0.2	0	0	0	0	0.0333	0.0667	0.1808	
	0.3	0.3	0.1	0	0.1	0	0.1667	0.1000		
	0.3	0.3	0.1	0	0.1	0	0.1667	0.1000		
	0.5	0.4	0.3	0.5	0.3	0.5	0.3667	0.4667		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C3</b>	S1	0.1	0.2	0.1	0.2	0.1	0.2	0.1000	0.2000	0.2925
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.5	0.4	0.5	0.4	0.5	0.4	0.5000	0.4000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0	0	0.1	0.2	0.1	0.2	0.0667	0.1333	0.2367
		0.1	0	0.3	0.3	0.3	0.3	0.2333	0.2000	
		0.1	0	0.3	0.3	0.3	0.3	0.2333	0.2000	
		0.3	0.5	0.5	0.4	0.5	0.4	0.4333	0.4333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0.5	0.6	0.1	0.2	0.1	0.2	0.2333	0.3333	0.4225
		0.7	0.7	0.3	0.3	0.3	0.3	0.4333	0.4333	
		0.7	0.7	0.3	0.3	0.3	0.3	0.4333	0.4333	
		0.9	0.8	0.5	0.4	0.5	0.4	0.6333	0.5333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.5	0.6	0.1	0.2	0.1	0.2	0.2333	0.3333	0.4225
		0.7	0.7	0.3	0.3	0.3	0.3	0.4333	0.4333	
0.7		0.7	0.3	0.3	0.3	0.3	0.4333	0.4333		
0.9		0.8	0.5	0.4	0.5	0.4	0.6333	0.5333		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.1	0.2	0.1	0.2	0	0	0.0667	0.1333	0.2367	
	0.3	0.3	0.3	0.3	0.1	0	0.2333	0.2000		
	0.3	0.3	0.3	0.3	0.1	0	0.2333	0.2000		
	0.5	0.4	0.5	0.4	0.3	0.5	0.4333	0.4333		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C4</b>	S1	0.5	0.6	0.1	0.2	0.3	0.4	0.3000	0.4000	0.4875
		0.7	0.7	0.3	0.3	0.5	0.5	0.5000	0.5000	
		0.7	0.7	0.3	0.3	0.5	0.5	0.5000	0.5000	
		0.9	0.8	0.5	0.4	0.7	0.6	0.7000	0.6000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0	0	0	0	0	0	0.0000	0.0000	0.1083
		0	0	0.1	0	0.1	0	0.0667	0.0000	
		0	0	0.1	0	0.1	0	0.0667	0.0000	
		0.1	0.5	0.3	0.5	0.3	0.5	0.2333	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0	0	0	0	0.1	0.2	0.0333	0.0667	0.1808
		0.1	0	0.1	0	0.3	0.3	0.1667	0.1000	
		0.1	0	0.1	0	0.3	0.3	0.1667	0.1000	
		0.3	0.5	0.3	0.5	0.5	0.4	0.3667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.3	0.4	0	0	0	0	0.1000	0.1333	0.2458
		0.5	0.5	0.1	0	0.1	0	0.2333	0.1667	
0.5		0.5	0.1	0	0.1	0	0.2333	0.1667		
0.7		0.6	0.3	0.5	0.3	0.5	0.4333	0.5333		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.1	0.2	0.1	0.2	0.1	0.2	0.1000	0.2000	0.2925	
	0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000		
	0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000		
	0.5	0.4	0.5	0.4	0.5	0.4	0.5000	0.4000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C5</b>	S1	0.1	0.2	0.3	0.4	0.5	0.6	0.3000	0.4000	0.4875
		0.3	0.3	0.5	0.5	0.7	0.7	0.5000	0.5000	
		0.3	0.3	0.5	0.5	0.7	0.7	0.5000	0.5000	
		0.5	0.4	0.7	0.6	0.9	0.8	0.7000	0.6000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0	0	0.1	0.2	0	0	0.0333	0.0667	0.1808
		0.1	0	0.3	0.3	0.1	0	0.1667	0.1000	
		0.1	0	0.3	0.3	0.1	0	0.1667	0.1000	
		0.3	0.5	0.5	0.4	0.3	0.5	0.3667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0	0	0.1	0.2	0.1	0.2	0.0667	0.1333	0.2200
		0	0	0.3	0.3	0.3	0.3	0.2000	0.2000	
		0	0	0.3	0.3	0.3	0.3	0.2000	0.2000	
		0.1	0.5	0.5	0.4	0.5	0.4	0.3667	0.4333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0	0	0.1	0.2	0.3	0.4	0.1333	0.2000	0.3017
		0.1	0	0.3	0.3	0.5	0.5	0.3000	0.2667	
0.1		0	0.3	0.3	0.5	0.5	0.3000	0.2667		
0.3		0.5	0.5	0.4	0.7	0.6	0.5000	0.5000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.3	0.4	0.1	0.2	0.3	0.4	0.2333	0.3333	0.4225	
	0.5	0.5	0.3	0.3	0.5	0.5	0.4333	0.4333		
	0.5	0.5	0.3	0.3	0.5	0.5	0.4333	0.4333		
	0.7	0.6	0.5	0.4	0.7	0.6	0.6333	0.5333		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C6</b>	S1	0.5	0.6	0.5	0.6	0.5	0.6	0.5000	0.6000	0.6825
		0.7	0.7	0.7	0.7	0.7	0.7	0.7000	0.7000	
		0.7	0.7	0.7	0.7	0.7	0.7	0.7000	0.7000	
		0.9	0.8	0.9	0.8	0.9	0.8	0.9000	0.8000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0.5	0.6	0.1	0.2	0.1	0.2	0.2333	0.3333	0.4225
		0.7	0.7	0.3	0.3	0.3	0.3	0.4333	0.4333	
		0.7	0.7	0.3	0.3	0.3	0.3	0.4333	0.4333	
		0.9	0.8	0.5	0.4	0.5	0.4	0.6333	0.5333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0.1	0.2	0.3	0.4	0.1	0.2	0.1667	0.2667	0.3575
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.5	0.4	0.7	0.6	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.3	0.4	0.1	0.2	0.1	0.2	0.1667	0.2667	0.3575
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
0.7		0.6	0.5	0.4	0.5	0.4	0.5667	0.4667		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.5	0.6	0.1	0.2	0.5	0.6	0.3667	0.4667	0.5525	
	0.7	0.7	0.3	0.3	0.7	0.7	0.5667	0.5667		
	0.7	0.7	0.3	0.3	0.7	0.7	0.5667	0.5667		
	0.9	0.8	0.5	0.4	0.9	0.8	0.7667	0.6667		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C7</b>	<b>S1</b>	0.5	0.6	0.7	0.8	0.7	0.8	0.6333	0.7333	0.8000
		0.7	0.7	0.9	0.9	0.9	0.9	0.8333	0.8333	
		0.7	0.7	0.9	0.9	0.9	0.9	0.8333	0.8333	
		0.9	0.8	1	0.95	1	0.95	0.9667	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S2</b>	0	0	0.1	0.2	0	0	0.0333	0.0667	0.1642
		0	0	0.3	0.3	0.1	0	0.1333	0.1000	
		0	0	0.3	0.3	0.1	0	0.1333	0.1000	
		0.1	0.5	0.5	0.4	0.3	0.5	0.3000	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S3</b>	0.3	0.4	0.1	0.2	0.1	0.2	0.1667	0.2667	0.3575
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.7	0.6	0.5	0.4	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S4</b>	0	0	0	0	0	0	0.0000	0.0000	0.1250
		0.1	0	0.1	0	0.1	0	0.1000	0.0000	
		0.1	0	0.1	0	0.1	0	0.1000	0.0000	
		0.3	0.5	0.3	0.5	0.3	0.5	0.3000	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S5</b>	0	0	0	0	0.1	0.2	0.0333	0.0667	0.1808
0.1		0	0.1	0	0.3	0.3	0.1667	0.1000		
0.1		0	0.1	0	0.3	0.3	0.1667	0.1000		
0.3		0.5	0.3	0.5	0.5	0.4	0.3667	0.4667		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK-1. Devami**

<b>C8</b>	S1	0.1	0.2	0.3	0.4	0.1	0.2	0.1667	0.2667	0.3575
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.5	0.4	0.7	0.6	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0	0	0	0	0	0	0.0000	0.0000	0.1083
		0.1	0	0	0	0.1	0	0.0667	0.0000	
		0.1	0	0	0	0.1	0	0.0667	0.0000	
		0.3	0.5	0.1	0.5	0.3	0.5	0.2333	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0.3	0.4	0.1	0.2	0.1	0.2	0.1667	0.2667	0.3575
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.5	0.5	0.3	0.3	0.3	0.3	0.3667	0.3667	
		0.7	0.6	0.5	0.4	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.3	0.4	0.5	0.6	0.5	0.6	0.4333	0.5333	0.6175
		0.5	0.5	0.7	0.7	0.7	0.7	0.6333	0.6333	
0.5		0.5	0.7	0.7	0.7	0.7	0.6333	0.6333		
0.7		0.6	0.9	0.8	0.9	0.8	0.8333	0.7333		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.5	0.6	0.5	0.6	0.5	0.6	0.5000	0.6000	0.6825	
	0.7	0.7	0.7	0.7	0.7	0.7	0.7000	0.7000		
	0.7	0.7	0.7	0.7	0.7	0.7	0.7000	0.7000		
	0.9	0.8	0.9	0.8	0.9	0.8	0.9000	0.8000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		



**EK-1. Devami**

<b>C9</b>	S1	0.1	0.2	0.1	0.2	0	0	0.0667	0.1333	0.2367
		0.3	0.3	0.3	0.3	0.1	0	0.2333	0.2000	
		0.3	0.3	0.3	0.3	0.1	0	0.2333	0.2000	
		0.5	0.4	0.5	0.4	0.3	0.5	0.4333	0.4333	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S2	0.1	0.2	0.1	0.2	0.1	0.2	0.1000	0.2000	0.2925
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.3	0.3	0.3	0.3	0.3	0.3	0.3000	0.3000	
		0.5	0.4	0.5	0.4	0.5	0.4	0.5000	0.4000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S3	0	0	0	0	0	0	0.0000	0.0000	0.0917
		0.1	0	0	0	0	0	0.0333	0.0000	
		0.1	0	0	0	0	0	0.0333	0.0000	
		0.3	0.5	0.1	0.5	0.1	0.5	0.1667	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	S4	0.1	0.2	0	0	0.1	0.2	0.0667	0.1333	0.2367
		0.3	0.3	0.1	0	0.3	0.3	0.2333	0.2000	
0.3		0.3	0.1	0	0.3	0.3	0.2333	0.2000		
0.5		0.4	0.3	0.5	0.5	0.4	0.4333	0.4333		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
S5	0.5	0.6	0.1	0.2	0.3	0.4	0.3000	0.4000	0.4875	
	0.7	0.7	0.3	0.3	0.5	0.5	0.5000	0.5000		
	0.7	0.7	0.3	0.3	0.5	0.5	0.5000	0.5000		
	0.9	0.8	0.5	0.4	0.7	0.6	0.7000	0.6000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		
	1	0.9	1	0.9	1	0.9	1.0000	0.9000		

**EK -1. Devamı**

<b>C10</b>	<b>S1</b>	0.3	0.4	0.5	0.6	0.3	0.4	0.3667	0.4667	0.5525
		0.5	0.5	0.7	0.7	0.5	0.5	0.5667	0.5667	
		0.5	0.5	0.7	0.7	0.5	0.5	0.5667	0.5667	
		0.7	0.6	0.9	0.8	0.7	0.6	0.7667	0.6667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S2</b>	0	0	0	0	0	0	0.0000	0.0000	0.1250
		0.1	0	0.1	0	0.1	0	0.1000	0.0000	
		0.1	0	0.1	0	0.1	0	0.1000	0.0000	
		0.3	0.5	0.3	0.5	0.3	0.5	0.3000	0.5000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S3</b>	0	0	0	0	0.1	0.2	0.0333	0.0667	0.1642
		0.1	0	0	0	0.3	0.3	0.1333	0.1000	
		0.1	0	0	0	0.3	0.3	0.1333	0.1000	
		0.3	0.5	0.1	0.5	0.5	0.4	0.3000	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S4</b>	0.1	0.2	0.3	0.4	0.1	0.2	0.1667	0.2667	0.3575
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.3	0.3	0.5	0.5	0.3	0.3	0.3667	0.3667	
		0.5	0.4	0.7	0.6	0.5	0.4	0.5667	0.4667	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
		1	0.9	1	0.9	1	0.9	1.0000	0.9000	
	<b>S5</b>	0.1	0.2	0	0	0.1	0.2	0.0667	0.1333	0.2367
0.3		0.3	0.1	0	0.3	0.3	0.2333	0.2000		
0.3		0.3	0.1	0	0.3	0.3	0.2333	0.2000		
0.5		0.4	0.3	0.5	0.5	0.4	0.4333	0.4333		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		
1		0.9	1	0.9	1	0.9	1.0000	0.9000		

## EK-2. ÇATDP GAMS Modeli

### Sets

i parçalar/i1,i2,i3,i4,i5/  
j tedarikciler/j1,j2,j3,j4,j5/  
k indirim aralığı /k1,k2,k3/;

### Parameter

C(j)'production capacity of supplier j'/j1 4300, j2 3375, j3 4000, j4 3050, j5 2400/

R(j)'tedarikci risk oranı'/j1 0.2705, j2 0.1357, j3 0.1778, j4 0.2008, j5 0.2183/

D(i) 'firmanın aylık ürün talepleri' /i1 1223, i2 2446, i3 1223, i4 2446, i5 2446/

G(j) 'tedarikci güvenilirliği' / j1 0.875, j2 0.9893, j3 0.958, j4 0.935, j5 0.967 /

B(j) 'delivery performance' / j1 0.90, j2 0.87, j3 0.97, j4 0.95, j5 0.92 /

H(j) 'tedarikci hatalı parça oranı' /j1 0.0001, j2 0.00008, j3 0.00016, j4 0.00018, j5 0.00025/

E(j) 'teslim zamanı' / j1 20.11, j2 30.11, j3 12.54, j4 13.10, j5 13.70/;

### Table

L(i,j,k)

	k1	k2	k3
i1.j1	0	400	800
i1.j2	0	400	800
i1.j3	0	400	800
i1.j4	0	400	800
i1.j5	0	400	800
i2.j1	0	400	800
i2.j2	0	400	800
i2.j3	0	400	800
i2.j4	0	400	800
i2.j5	0	400	800
i3.j1	0	400	800
i3.j2	0	400	800
i3.j3	0	400	800
i3.j4	0	400	800
i3.j5	0	400	800
i4.j1	0	400	800
i4.j2	0	400	800
i4.j3	0	400	800
i4.j4	0	400	800
i4.j5	0	400	800
i5.j1	0	400	800
i5.j2	0	400	800
i5.j3	0	400	800
i5.j4	0	400	800
i5.j5	0	400	800;

## Ek-2. Devamı

Table

U(i,j,k)	k1	k2	k3
i1.j1	400	800	3000
i1.j2	400	800	3000
i1.j3	400	800	3000
i1.j4	400	800	3000
i1.j5	400	800	3000
i2.j1	400	800	3000
i2.j2	400	800	3000
i2.j3	400	800	3000
i2.j4	400	800	3000
i2.j5	400	800	3000
i3.j1	400	800	3000
i3.j2	400	800	3000
i3.j3	400	800	3000
i3.j4	400	800	3000
i3.j5	400	800	3000
i4.j1	400	800	3000
i4.j2	400	800	3000
i4.j3	400	800	3000
i4.j4	400	800	3000
i4.j5	400	800	3000
i5.j1	400	800	3000
i5.j2	400	800	3000
i5.j3	400	800	3000
i5.j4	400	800	3000
i5.j5	400	800	3000;

Table

P(i,j,k) 'satin alma maliyeti'

	k1	k2	k3
i1.j1	400	392	380
i1.j2	425	416.5	403.8
i1.j3	375	367.5	356.3
i1.j4	390	382.2	370.5
i1.j5	380	372.4	361
i2.j1	120	117.6	114
i2.j2	127	124.5	120.7
i2.j3	112	109.8	106.4
i2.j4	117	114.7	111.2
i2.j5	114	111.7	108.3
i3.j1	280	274.4	266
i3.j2	297	291.1	282.2
i3.j3	262	256.8	248.9
i3.j4	273	267.5	259.4
i3.j5	266	260.7	252.7
i4.j1	40	39.2	38
i4.j2	42	41.2	39.9
i4.j3	37	36.3	35.2
i4.j4	39	38.2	37.1
i4.j5	38	37.2	36.1

## Ek-2. Devamı

i5.j1	80	78.4	76
i5.j2	85	83.3	80.8
i5.j3	75	73.5	71.3
i5.j4	78	76.4	74.1
i5.j5	76	74.5	72.2;

Table

T(i,j,k) 'tasima maliyeti'

	k1	k2	k3
i1.j1	3.125	3.125	3.125
i1.j2	6.25	6.25	6.25
i1.j3	3.125	3.125	3.125
i1.j4	2.34	2.34	2.34
i1.j5	2.34	2.34	2.34
i2.j1	1.625	1.625	1.625
i2.j2	3.125	3.125	3.125
i2.j3	1.625	1.625	1.625
i2.j4	1.17	1.17	1.17
i2.j5	1.17	1.17	1.17
i3.j1	3.125	3.125	3.125
i3.j2	6.25	6.25	6.25
i3.j3	3.125	3.125	3.125
i3.j4	2.34	2.34	2.34
i3.j5	2.34	2.34	2.34
i4.j1	1.625	1.625	1.625
i4.j2	3.125	3.125	3.125
i4.j3	1.625	1.625	1.625
i4.j4	1.17	1.17	1.17
i4.j5	1.17	1.17	1.17
i5.j1	1.625	1.625	1.625
i5.j2	3.125	3.125	3.125
i5.j3	1.625	1.625	1.625
i5.j4	1.17	1.17	1.17
i5.j5	1.17	1.17	1.17;

Table

m(i,j) min siparis miktarı

	j1	j2	j3	j4	j5
i1	284	262	220	148	136
i2	568	524	440	296	272
i3	284	262	220	148	136
i4	568	524	440	296	272
i5	568	524	440	296	272 ;

Scalar Ex 'Müsterinin belirlediği teslimat süresi' /96/;

Scalar Hx 'Hatalı parça oranı sınırı'/0.005/;

Scalar N 'Büyük bir sayı'/10000/;

## Ek-2. Devamı

Variable

z1

Q(i,j,k)'j tedarikcisinden saglanan i parcasinin siparis miktarı'

Y(i,j,k)'i parcasının j tedarikçisinden tedarik edilip edilmemesi';

Positive variable

Ax;

Integer variable

Q(i,j,k)'j tedarikcisinden saglanan i parcasinin siparis miktarı';

Binary variable

Y(i,j,k) 'i parcasının j tedarikçisinden tedarik edilip edilmemesi';

set amaclar /maliyet,risk,delivery/;

Equation

memnuniyet\_amac

maliyet\_amac 'toplam siparis maliyetinin minimizasyonu'

risk\_amac 'tedarikci risk minimizasyonu'

teslimat\_amac 'tedarikci teslimat performansı maksimizasyonu'

guvenirlilik\_amac 'tedarikci guvenilirliđi maksimizasyonu'

talep 'her ürün için talep miktarının yerine getirilme kisiti'

kapasite 'sipariş edilen toplam ürün sayısının kapasite kisiti'

hatali\_parca 'ürünlerin ortalama küsur yüzdesinin belirli bir sınırı asmama kisiti'

teslim\_zamani 'secilen tedarikcilerin ortalama teslim süresinin istenen genel teslim süresinden daha az olması kisiti'

siparis\_verme 'siparis verilen parcanin belli miktarinin belli tedarikciden saglanma kisiti'

siparis\_iliskisi 'siparis miktarı ve siparis tahsisi degiskenleri arasindaki iliski kisiti'

kisit1

kisit2

kisit3

kisit4;

memnuniyet\_amac.. z1=e=Ax;

maliyet\_amac.. sum ((i,j,k),P(i,j,k)\*Q(i,j,k)) + sum ((i,j,k),T(i,j,k)\*Q(i,j,k))=1=2392099.8550  
1097296.435\*Ax;

## Ek-2. Devami

```
risk_amac..    sum((i,j,k), R(j)*Q(i,j,k))=l=3468.6975-1815.7828*Ax;
teslimat_amac..    sum ((i,j,k),B(j)*Q(i,j,k))=g=9104.80+6686.95*Ax;
guvenirlilik_amac(i)..    sum((j,k),G(j)*Y(i,j,k))=g=0.95;
talep(i) ..sum((j,k),Q(i,j,k))=g=D(i);
kapasite(j) .. sum ((i,k),Q(i,j,k))=l=C(j);
hatali_parca(i) .. sum ((j,k),H(j)* Y(i,j,k))=l= Hx;
teslim_zamani(i) .. sum ((j,k), E(j)*Y(i,j,k))=l=Ex;
siparis_verme(i,j,k) .. Q(i,j,k) =g= m(i,j)*Y(i,j,k);
siparis_iliskisi(i,j,k).. Q(i,j,k) =l= N*Y(i,j,k);
kisit1(i,j).. sum (k,Y(i,j,k))=l=1;
kisit4 (i).. sum ((j,k),Y(i,j,k))=g=2;
kisit2 (i,j,k).. Q(i,j,k)=l=U(i,j,k)*Y(i,j,k);
kisit3 (i,j,k).. Q(i,j,k)=g=L(i,j,k)*Y(i,j,k);
Model siparis_tahsisi /all/;
option mip=Lindo;
solve siparis_tahsisi using mip minimizing z1;
solve siparis_tahsisi using mip minimizing z2;
solve siparis_tahsisi using mip maximizing z3;
```

### EK-3. Şans Kısıtlı ÇATDP GAMS Modeli

#### Sets

i parçalar/i1,i2,i3,i4,i5/  
j tedarikciler/j1,j2,j3,j4,j5/  
k indirim aralığı /k1,k2,k3/;

#### Parameter

C(j)'production capacity of supplier j'/j1 4300, j2 3375, j3 4000, j4 3050, j5 2400/

R(j)'tedarikci risk oranı'/j1 0.2705, j2 0.1357, j3 0.1778, j4 0.2008, j5 0.2183/

D(i) 'firmanın aylık ürün talepleri' /i1 1798, i2 3596, i3 1798, i4 3596, i5 3596/

G(j) 'tedarikci güvenilirliği' / j1 0.875, j2 0.9893, j3 0.958, j4 0.935, j5 0.967 /

B(j) 'delivery performance' / j1 0.90, j2 0.87, j3 0.97, j4 0.95, j5 0.92 /

H(j) 'tedarikci hatalı parça oranı' /j1 0.0001, j2 0.00008, j3 0.00016, j4 0.00018, j5 0.00025/

E(j) 'teslim zamanı'/ j1 20.11, j2 30.11, j3 12.54, j4 13.10, j5 13.70/

Var(j)'varyans' /j1 2.108, j2 2.218, j3 1.521, j4 2.342, j5 2.048/;

#### Table

L(i,j,k)

	k1	k2	k3
i1.j1	0	400	800
i1.j2	0	400	800
i1.j3	0	400	800
i1.j4	0	400	800
i1.j5	0	400	800
i2.j1	0	400	800
i2.j2	0	400	800
i2.j3	0	400	800
i2.j4	0	400	800
i2.j5	0	400	800
i3.j1	0	400	800
i3.j2	0	400	800
i3.j3	0	400	800
i3.j4	0	400	800
i3.j5	0	400	800
i4.j1	0	400	800
i4.j2	0	400	800
i4.j3	0	400	800
i4.j4	0	400	800
i4.j5	0	400	800
i5.j1	0	400	800
i5.j2	0	400	800
i5.j3	0	400	800
i5.j4	0	400	800
i5.j5	0	400	800



### Ek-3. Devamı

Table

U(i,j,k)	k1	k2	k3
i1.j1	400	800	3000
i1.j2	400	800	3000
i1.j3	400	800	3000
i1.j4	400	800	3000
i1.j5	400	800	3000
i2.j1	400	800	3000
i2.j2	400	800	3000
i2.j3	400	800	3000
i2.j4	400	800	3000
i2.j5	400	800	3000
i3.j1	400	800	3000
i3.j2	400	800	3000
i3.j3	400	800	3000
i3.j4	400	800	3000
i3.j5	400	800	3000
i4.j1	400	800	3000
i4.j2	400	800	3000
i4.j3	400	800	3000
i4.j4	400	800	3000
i4.j5	400	800	3000
i5.j1	400	800	3000
i5.j2	400	800	3000
i5.j3	400	800	3000
i5.j4	400	800	3000
i5.j5	400	800	3000;

Table

P(i,j,k) 'satin alma maliyeti'

	k1	k2	k3
i1.j1	400	392	380
i1.j2	425	416.5	403.8
i1.j3	375	367.5	356.3
i1.j4	390	382.2	370.5
i1.j5	380	372.4	361
i2.j1	120	117.6	114
i2.j2	127	124.5	120.7
i2.j3	112	109.8	106.4
i2.j4	117	114.7	111.2
i2.j5	114	111.7	108.3
i3.j1	280	274.4	266
i3.j2	297	291.1	282.2
i3.j3	262	256.8	248.9
i3.j4	273	267.5	259.4
i3.j5	266	260.7	252.7
i4.j1	40	39.2	38
i4.j2	42	41.2	39.9
i4.j3	37	36.3	35.2
i4.j4	39	38.2	37.1
i4.j5	38	37.2	36.1
i5.j1	80	78.4	76
i5.j2	85	83.3	80.8

### Ek-3. Devamı

i5,j3	75	73.5	71.3
i5,j4	78	76.4	74.1
i5,j5	76	74.5	72.2;

Table

T(i,j,k)'tasima maliyeti'

	k1	k2	k3
i1,j1	3.125	3.125	3.125
i1,j2	6.25	6.25	6.25
i1,j3	3.125	3.125	3.125
i1,j4	2.34	2.34	2.34
i1,j5	2.34	2.34	2.34
i2,j1	1.625	1.625	1.625
i2,j2	3.125	3.125	3.125
i2,j3	1.625	1.625	1.625
i2,j4	1.17	1.17	1.17
i2,j5	1.17	1.17	1.17
i3,j1	3.125	3.125	3.125
i3,j2	6.25	6.25	6.25
i3,j3	3.125	3.125	3.125
i3,j4	2.34	2.34	2.34
i3,j5	2.34	2.34	2.34
i4,j1	1.625	1.625	1.625
i4,j2	3.125	3.125	3.125
i4,j3	1.625	1.625	1.625
i4,j4	1.17	1.17	1.17
i4,j5	1.17	1.17	1.17
i5,j1	1.625	1.625	1.625
i5,j2	3.125	3.125	3.125
i5,j3	1.625	1.625	1.625
i5,j4	1.17	1.17	1.17
i5,j5	1.17	1.17	1.17;

Table

m(i,j) min siparis miktarı

	j1	j2	j3	j4	j5
i1	284	262	220	148	136
i2	568	524	440	296	272
i3	284	262	220	148	136
i4	568	524	440	296	272
i5	568	524	440	296	272 ;

Scalar Ex 'Müsterinin belirlediği teslimat süresi' /96/;

Scalar Hx 'Hatalı parça oranı sınırı'/0.005/;

Scalar N 'Büyük bir sayı'/10000/;

Scalar ND /1.645/;

### Ek-3. Devamı

Variable

z1  
z2  
z3

$Q(i,j,k)$ 'j tedarikcisinden saglanan i parcasinin siparis miktarı'

$Y(i,j,k)$ 'i parcasının j tedarikçisinden tedarik edilip edilmemesi';

Integer variable

$Q(i,j,k)$ 'j tedarikcisinden saglanan i parcasinin siparis miktarı';

Binary variable

$Y(i,j,k)$  'i parcasının j tedarikçisinden tedarik edilip edilmemesi';

Set amaclar /maliyet,risk,delivery/;

Equation

maliyet\_amac 'toplam siparis maliyetinin minimizasyonu'

risk\_amac 'tedarikci risk minimizasyonu'

teslimat\_amac 'tedarikci teslimat performansı maksimizasyonu'

guvenirlilik\_amac 'tedarikci guvenirlirliđi maksimizasyonu'

talep 'her ürün için talep miktarının yerine getirilme kisiti'

kapasite 'sipariş edilen toplam ürün sayısının kapasite kisiti'

hatali\_parca 'ürünlerin ortalama küsür yüzdesinin belirli bir sınırı asmama kisiti'

teslim\_zamani 'secilen tedarikcilerin ortalama teslim süresinin istenen genel teslim süresinden daha az olması kisiti'

siparis\_verme 'siparis verilen parcanin belli miktarinin belli tedarikciden saglanma kisiti'

siparis\_iliskisi 'siparis miktarı ve siparis tahsisi degiskenleri arasindaki iliski kisiti'

kisit1

kisit2

kisit3

kisit4

kisit5;

maliyet\_amac ..  $z1=e=\sum((i,j,k),P(i,j,k)*Q(i,j,k)) + \sum((i,j,k),T(i,j,k)*Q(i,j,k));$

risk\_amac..  $z2=e=\sum((i,j,k), R(j)*Q(i,j,k));$

### Ek-3. Devami

```
teslimat_amac.. z3=e=sum ((i,j,k),B(j)*Q(i,j,k));
guvenirlilik_amac(i).. sum((j,k),G(j)*Y(i,j,k))=g=0.95;
talep(i) ..sum((j,k),Q(i,j,k))=g=D(i);
kapasite(j) .. sum ((i,k),Q(i,j,k))=l=C(j);
hatali_parca(i) .. sum ((j,k),H(j)* Y(i,j,k))=l= Hx;
kisit5(i).. sum (j,Var(j)*Var(j))=l=sum (j,Var(j))*sum (j,Var(j));
teslim_zamani(i) .. sum ((j,k), E(j)*Y(i,j,k))+ ND*sum((j,k), Var(j)*Y(i,j,k))=l=Ex;
siparis_verme(i,j,k) .. Q(i,j,k) =g= m(i,j)*Y(i,j,k);
siparis_iliskisi(i,j,k).. Q(i,j,k) =l= N*Y(i,j,k);
kisit1(i,j).. sum (k,Y(i,j,k))=l=1;
kisit4 (i).. sum ((j,k),Y(i,j,k))=g=2;
kisit2 (i,j,k).. Q(i,j,k)=l=U(i,j,k)*Y(i,j,k);
kisit3 (i,j,k).. Q(i,j,k)=g=L(i,j,k)*Y(i,j,k);
Model siparis_tahsisi /all/;
option optcr=0.00;
solve siparis_tahsisi using mip minimizing z1;
solve siparis_tahsisi using mip minimizing z2;
solve siparis_tahsisi using mip maximizing z3;
```