TP 1 Aalises Modelos CCR/CRS

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Definição do Tp

Rode os modelos CRS/CCR e analise os resultados. Identifique os itens abaixo:

- a eficiência das DMUs
- histograma das eficiências
- identifique as DMUs dentro das eficiências do histograma
- os benchmarks para cada DMU
- os pesos relativos dos inputs e outputs
- identifique as DMUs fortemente e fracamente eficientes
- apresente as projeções e metas para os inputs e outputs

Conclusão da analise:

Rodando os modelos para os dado de Distribuição:
Multlipicadores foi encontrado os mesmos valores de eficiencia das DMUS
porém a contribuição(pesos), mudam muito se voltado para os inputs e outputs,
outra coisa é que o segundo input e o primeiro output, tem uma importancia
muito maior do que o resto para a Ef
No modelo de envelope foi também encontrado as dmus de referencia para as outras,
no dados dede distribuição foram basicamente 8, 11 e 13 como refencia para as outras.
Com isso foi analisadoas folgas e assim foi possivel ver que somente a 13 é
fortemente eficiente, e a 8 e 11 apresentam folgas. Também a projeção de metas,
no geral diminuir inputs, aumentar outputs, algumas vezes o contrario porém são

valores baixos, então não necessearíamente valem de algo.
Para a data de provisão os resultados foram similares, mas os pesos estão mais distribuidos,as dmus de referencias são 3, 13 e 16, e todas são fortemente eficientes, eu fiz a analise sem levar em conta as folgas, a analise pelo llamda da o mesmo resultado do que pelas folgas

Os Dados usados são:

Table 1: dados de Provisão

DMU	codigo	I1	I2	O1
Air Canada	1	2293	7217121	13028613
ANA All Nippon Airways	2	2591	14651828	14683532
American Airlines	3	1112	26310000	34707729
British Airways	4	4624	19279420	21401581
Delta Air Lines	5	6628	23357000	27292425
Emirates	6	3457	20837627	27369447
Garuda Indonesia	7	102	4736127	2834184
KLM	8	4850	6706203	15090771
Lufthansa	9	1979	31867956	27007957
Malaysia Airlines	10	3762	3953020	7292543
Qantas	11	6074	15118143	17368244
SAS Scandinavian Airlines	12	2047	2954620	4152670
Singapore Airlines	13	438	22323127	21286125
TAM	14	2789	8314066	7840248
Thai Airways	15	4620	33144669	10441041
United Airlines	16	4897	12195000	29065589

Table 2: dados de Distribuição

DMU	codigo	I1	I2	I3	O1	O2
Air Canada	1	8352	1302813	3060770.35	6420786	1157081
ANA All Nippon Airways	2	6479	1468332	2556513.78	4286268	2059289
American Airlines	3	23102	3470729	8654892.94	17866791	2417898
British Airways	4	16563	2140181	5304411.47	10079586	4438214
Delta Air Lines	5	17408	2729225	7349946.47	14571329	1671083
Emirates	6	13153	2736947	4717271.61	11276662	6531110
Garuda Indonesia	7	2187	283484	676346.53	1514745	282129
KLM	8	8101	1509071	3027818.18	7347192	4093466
Lufthansa	9	33288	2700757	5759785.56	12398774	6928900

DMU	codigo	I1	I2	I3	O1	O2
Malaysia Airlines	10	5231	729243	1606904.02	2997171	2072022
Qantas	11	12156	1736844	3156052.26	9945797	2623457
SAS Scandinavian Airlines	12	4046	415270	1108178.33	2304528	344994
Singapore Airlines	13	9467	2128625	3513668.99	7733939	6559460
TAM	14	6810	784048	2015096.39	3935997	155797
Thai Airways	15	7374	1044141	2417856.19	4725671	2157255
United Airlines	16	18460	2906589	7647835.29	14645900	2340509

Rodando os modelos ccr para a Provisão voltados tanto para os inputs quanto para os outputs:

Pelos multiplicadores:

Table 3: CCR multiplicadores input

Ef	u(0)	u(1)	u(2)	v(0)	v(1)
90.980%	0.895	0.509	0.0	1.169	0.0
72.944%	1.854	0.0	0.0	1.405	0.0
92.819%	0.328	0.187	0.0	0.429	0.0
90.964%	0.0	0.82	0.0	0.567	0.14
98.870%	0.429	0.244	0.0	0.56	0.0
97.791%	0.343	0.0	0.518	0.567	0.089
93.311%	0.0	6.192	0.0	5.084	0.0
100.000%	0.0	1.163	0.0	0.804	0.199
94.480%	0.0	0.65	0.0	0.219	0.255
97.652%	0.0	2.407	0.0	0.811	0.943
100.000%	0.0	1.011	0.0	0.698	0.173
96.911%	0.0	4.227	0.0	3.471	0.0
100.000%	0.0	0.825	0.0	0.278	0.323
87.666%	0.0	2.239	0.0	1.838	0.0
88.182%	0.0	1.681	0.0	1.162	0.288
93.561%	0.404	0.229	0.0	0.527	0.0

Table 4: CCR multiplicadores output

Ef	u(0)	u(1)	u(2)	v(0)	v(1)
90.980%	0.984	0.559	0.0	1.285	0.0
72.944%	2.541	0.0	0.0	1.925	0.0
92.819%	0.354	0.201	0.0	0.462	0.0
90.964%	0.0	0.902	0.0	0.623	0.154
98.870%	0.434	0.246	0.0	0.566	0.0
97.791%	0.351	0.0	0.529	0.58	0.091
93.311%	0.0	6.636	0.0	5.449	0.0
100.000%	0.0	1.163	0.0	0.804	0.199
94.480%	0.0	0.688	0.0	0.232	0.269
97.652%	0.0	2.465	0.0	0.831	0.965
100.000%	0.0	1.011	0.0	0.698	0.173
96.911%	0.0	4.362	0.0	3.581	0.0
100.000%	0.0	0.825	0.0	0.278	0.323
87.666%	0.0	2.554	0.0	2.097	0.0
88.182%	0.0	1.906	0.0	1.317	0.326
93.561%	0.431	0.245	0.0	0.564	0.0

Por Envelopes:

Table 5: CCR envelope Input

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.283	0.0	0.0	0.436	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.583	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.449	0.0	0.0	1.465	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.826	0.0	0.0	0.404	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.68	0.0	0.0	0.962	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.052	0.0	0.0	0.135	0.0	0.285	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.152	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.678	0.0	0.0	0.0	0.0	0.009	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.22	0.0	0.0	0.0	0.0	0.179	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.232	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.396	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.423	0.0	0.0	0.163	0.0	0.0	0.0	0.0	0.0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.716	0.0	0.0	0.944	0.0	0.0	0.0	0.0	0.0

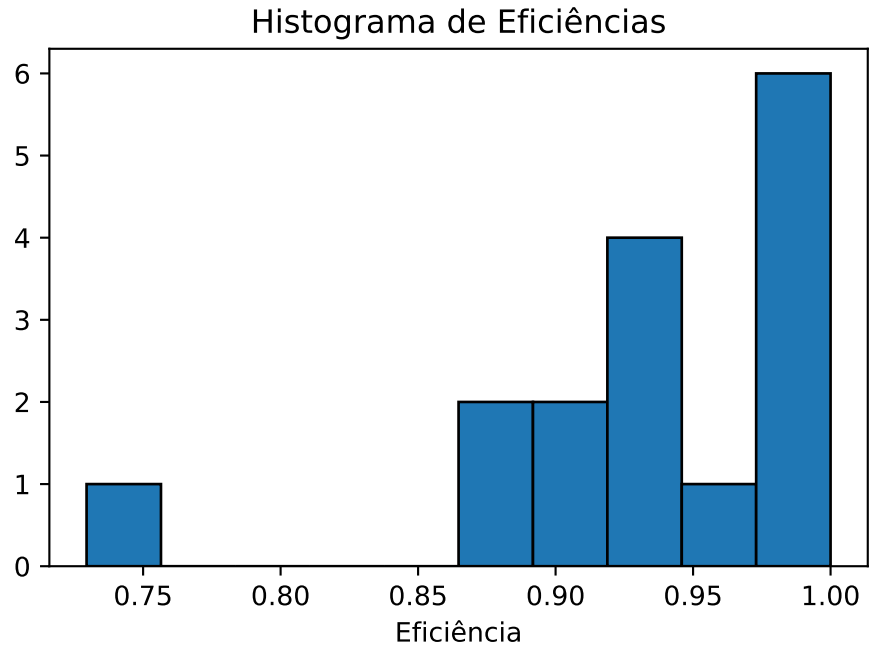
Table 6: CCR envelope Output

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.311	0.0	0.0	0.48	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.483	0.0	0.0	1.578	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.908	0.0	0.0	0.444	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.688	0.0	0.0	0.973	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.075	0.0	0.0	0.138	0.0	0.292	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.163	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.776	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.225	0.0	0.0	0.0	0.0	0.183	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.239	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.451	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.479	0.0	0.0	0.185	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.765	0.0	0.0	1.009	0.0	0.0	0.0	0.0	0.0

Eficiencias das DMUS e a classificação:

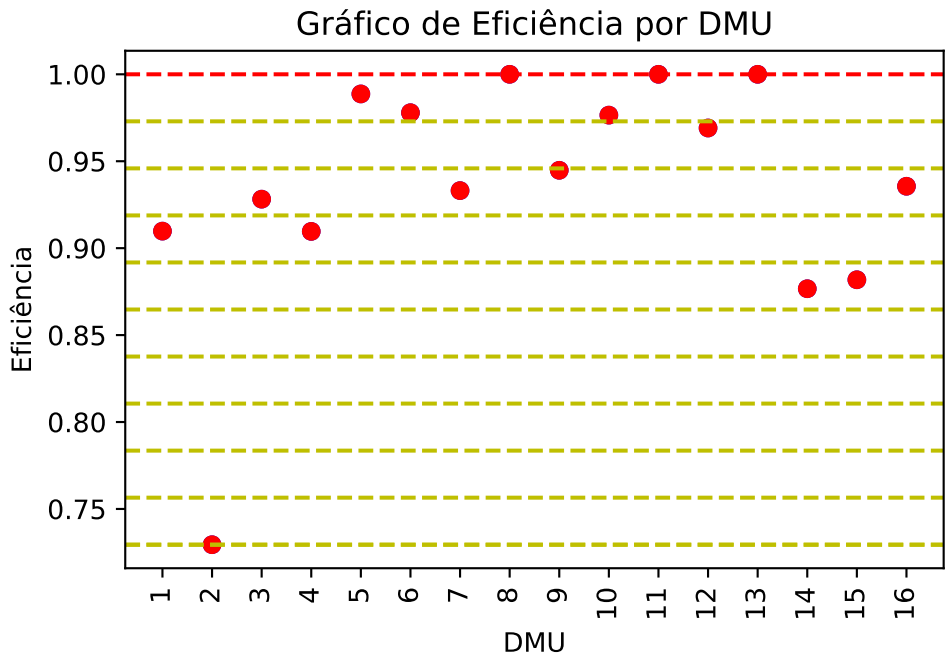
Histograma

Histograma das eficiencias



Eficiencia de cada dmu

Demostração de cada grupo do histograma



Classificação

Classificação se as dmus são realmente eficiencientes pela adicão das folgas

Table 7: Classificação das DMU

DMU	Eficiência	Classificação
1	90.93%	Ineficiente
2	72.92%	Ineficiente
3	92.65%	Ineficiente
4	90.91%	Ineficiente
5	98.69%	Ineficiente
6	97.78%	Ineficiente
7	93.30%	Ineficiente
8	100.00%	Fracamente Eficiente
9	94.32%	Ineficiente
10	97.63%	Ineficiente
11	100.00%	Fracamente Eficiente
12	96.88%	Ineficiente
13	100.00%	Fortemente Eficiente
14	87.61%	Ineficiente

DMU	Eficiência	Classificação
15	88.16%	Ineficiente
16	93.40%	Ineficiente

Projeções e Metas

Voltado ara os Inputs:

Table 8: Metas CCR input

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Inputs(2)	Meta-Outputs(0)	Meta-Outputs(1)
1	-9.09%	-9.09%	-27.05%	-0.08%	98.97%
2	-27.10%	-40.08%	-30.95%	-0.07%	15.89%
3	-7.17%	-7.17%	-30.87%	0.02%	134.97%
4	-29.95%	-8.97%	-28.81%	0.07%	0.06%
5	-1.18%	-1.18%	-30.68%	-0.05%	217.60%
6	-2.22%	-11.26%	-2.22%	-0.00%	-0.02%
7	-15.51%	-6.87%	-29.07%	-0.20%	41.34%
8	0.00%	0.00%	0.00%	0.00%	0.00%
9	-58.91%	-5.53%	-11.24%	-0.00%	-0.01%
10	-33.53%	-2.22%	-19.41%	0.12%	0.13%
11	0.00%	0.00%	0.00%	0.00%	0.00%
12	-30.30%	-2.97%	-33.93%	0.13%	76.42%
13	0.00%	0.00%	0.00%	0.00%	0.00%
14	-29.31%	-12.28%	-37.98%	0.06%	566.82%
15	-26.66%	-11.75%	-25.75%	0.07%	0.09%
16	-6.42%	-6.42%	-32.70%	0.02%	131.04%

Voltado para os Outputs

Table 9: Metas CCR output

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Inputs(2)	Meta-Outputs(0)	Meta-Outputs(1)
1	0.03%	0.01%	-19.74%	9.94%	118.85%
2	0.03%	-17.78%	-5.25%	37.13%	59.02%
3	-0.03%	-0.03%	-25.56%	7.70%	152.99%
4	-23.00%	0.06%	-21.75%	10.00%	9.99%

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Inputs(2)	Meta-Outputs(0)	Meta-Outputs(1)
5	-0.04%	-0.04%	-29.88%	1.10%	221.28%
6	-0.02%	-9.26%	-0.02%	2.24%	2.25%
7	-9.40%	-0.13%	-23.94%	7.03%	51.57%
8	0.00%	0.00%	0.00%	0.00%	0.00%
9	-56.49%	0.02%	-6.03%	5.86%	5.87%
10	-32.04%	-0.02%	-17.59%	2.38%	2.38%
11	0.00%	0.00%	0.00%	0.00%	0.00%
12	-28.19%	-0.04%	-31.93%	3.15%	81.74%
13	0.00%	0.00%	0.00%	0.00%	0.00%
14	-19.50%	-0.09%	-29.36%	13.96%	659.44%
15	-16.88%	0.00%	-15.87%	13.41%	13.39%
16	0.01%	0.01%	-28.07%	6.90%	146.89%

Dados de Provisão

por pesos

Table 10: CCR multiplicadores input provisão

Ef	u(0)	u(1)	v(0)
84.552%	0.628	1.225	1.139
58.340%	0.384	0.75	0.697
100.000%	0.279	0.544	0.506
58.290%	0.264	0.514	0.478
57.433%	0.204	0.397	0.369
77.932%	0.275	0.538	0.5
60.785%	11.312	2.159	3.765
94.414%	0.0	2.358	1.098
61.505%	0.22	0.43	0.4
77.402%	0.0	4.0	1.863
48.201%	0.0	1.046	0.487
58.970%	0.0	5.351	2.493
100.000%	2.478	0.473	0.825
43.107%	0.532	1.038	0.965
19.604%	0.182	0.354	0.33
100.000%	0.333	0.649	0.604

Por Envelopes:

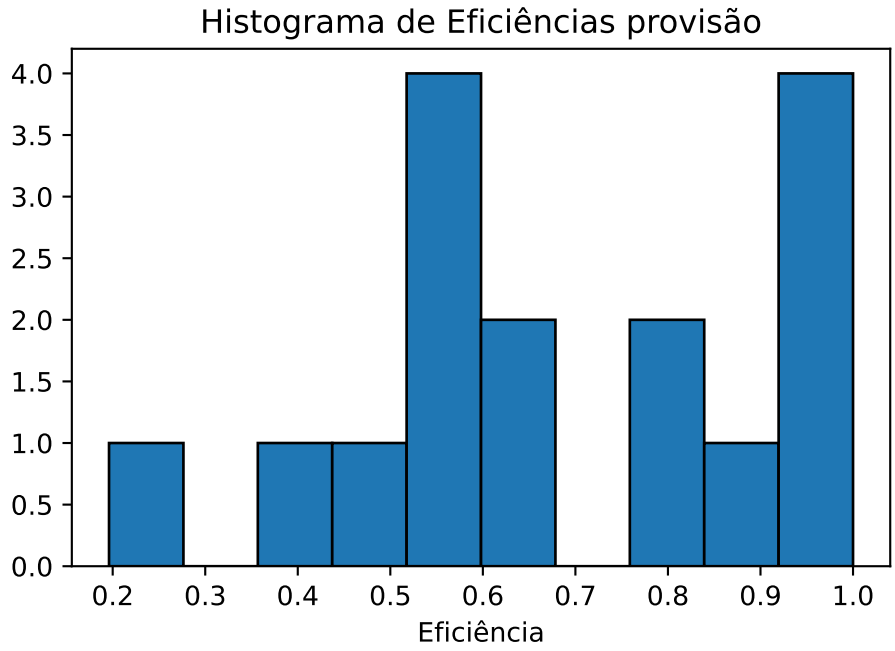
Table 11: CCR envelope Input provisão

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.0	0.0	0.054	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.384
0.0	0.0	0.203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.263
0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.192	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.507
0.0	0.0	0.167	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.739
0.0	0.0	0.405	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.458
0.0	0.0	0.009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.118	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.519
0.0	0.0	0.704	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.089
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.251
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.598
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.143
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
0.0	0.0	0.025	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.24
0.0	0.0	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.144
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Eficiencias das DMUS e a classificação:

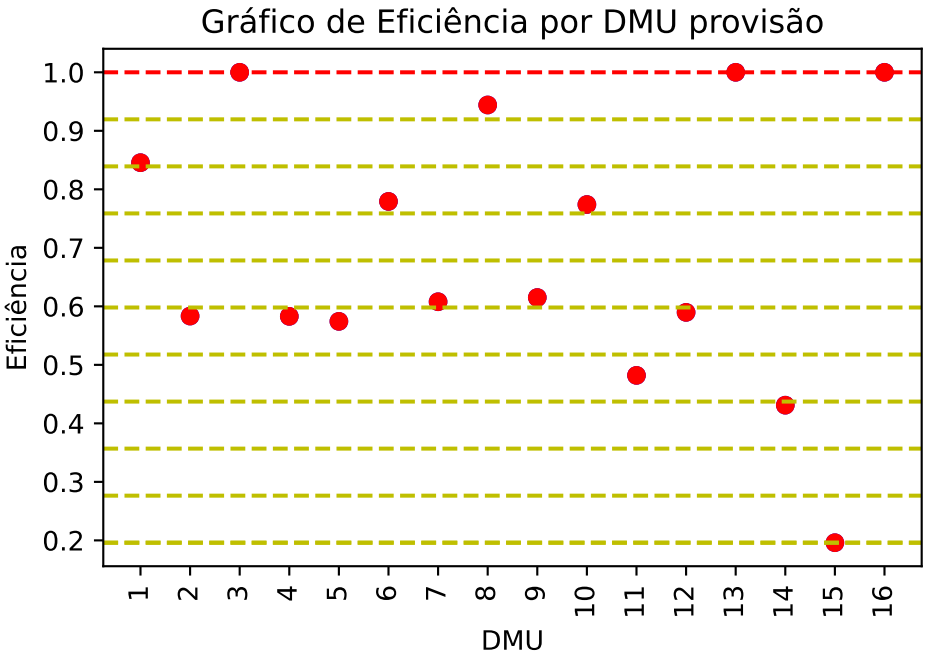
Histograma

Histograma das eficiencias



Eficiencia de cada dmu

Demostração de cada grupo do histograma



Classificação

Classificação se as dmus são realmente eficiencientes pela adicão das folgas

Table 12: Classificação das DMU

DMU	Eficiência	Classificação
1	84.55%	Ineficiente
2	58.34%	Ineficiente
3	100.00%	Fortemente Eficiente
4	58.29%	Ineficiente
5	57.43%	Ineficiente
6	77.93%	Ineficiente
7	60.79%	Ineficiente
8	94.35%	Ineficiente
9	61.50%	Ineficiente
10	77.35%	Ineficiente
11	48.20%	Ineficiente
12	58.95%	Ineficiente
13	100.00%	Fortemente Eficiente
14	43.11%	Ineficiente

DMU	Eficiência	Classificação
15	19.60%	Ineficiente
16	100.00%	Fortemente Eficiente

Projeções e Metas

Voltado ara os Inputs:

Table 13: Metas CCR input

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Outputs(0)
1	-15.37%	-15.43%	0.05%
2	-41.58%	-41.66%	0.04%
3	0.00%	0.00%	0.00%
4	-41.69%	-41.73%	-0.01%
5	-42.60%	-42.60%	-0.06%
6	-22.09%	-22.06%	-0.00%
7	-39.52%	-39.38%	-0.35%
8	-47.60%	-5.62%	-0.04%
9	-38.42%	-38.47%	0.05%
10	-67.33%	-22.57%	0.04%
11	-51.79%	-51.76%	0.07%
12	-65.79%	-40.98%	0.09%
13	0.00%	0.00%	0.00%
14	-56.86%	-56.89%	0.04%
15	-80.40%	-80.41%	-0.08%
16	0.00%	0.00%	0.00%

Voltado para os Outputs

Table 14: Metas CCR output

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Inputs(2)	Meta-Outputs(0)	Meta-Outputs(1)
1	0.03%	0.01%	-19.74%	9.94%	118.85%
2	0.03%	-17.78%	-5.25%	37.13%	59.02%
3	-0.03%	-0.03%	-25.56%	7.70%	152.99%
4	-23.00%	0.06%	-21.75%	10.00%	9.99%

DMU	Meta-Inputs(0)	Meta-Inputs(1)	Meta-Inputs(2)	Meta-Outputs(0)	Meta-Outputs(1)
5	-0.04%	-0.04%	-29.88%	1.10%	221.28%
6	-0.02%	-9.26%	-0.02%	2.24%	2.25%
7	-9.40%	-0.13%	-23.94%	7.03%	51.57%
8	0.00%	0.00%	0.00%	0.00%	0.00%
9	-56.49%	0.02%	-6.03%	5.86%	5.87%
10	-32.04%	-0.02%	-17.59%	2.38%	2.38%
11	0.00%	0.00%	0.00%	0.00%	0.00%
12	-28.19%	-0.04%	-31.93%	3.15%	81.74%
13	0.00%	0.00%	0.00%	0.00%	0.00%
14	-19.50%	-0.09%	-29.36%	13.96%	659.44%
15	-16.88%	0.00%	-15.87%	13.41%	13.39%
16	0.01%	0.01%	-28.07%	6.90%	146.89%