

Complete numerical results for the article
Estimation-based Metaheuristics for the
Vehicle Routing Problem with Stochastic
Demands and Customers

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1 Effectiveness of 2.5-opt-EEais

Table 1: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 30. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-AC	961751	289449
	TABUSTOCH	959586	289855
$\varphi = 0.050(2.00)$	RRLS-AC	961751	289449
	TABUSTOCH	955878	281641
$\varphi = 0.050(4.00)$	RRLS-AC	961751	289449
	TABUSTOCH	955878	281641
$\varphi = 0.050(8.00)$	RRLS-AC	961751	289449
	TABUSTOCH	955878	281641
$\varphi = 0.075(1.00)$	RRLS-AC	1385815	403089
	TABUSTOCH	1365647	377427
$\varphi = 0.075(2.00)$	RRLS-AC	1411679	412941
	TABUSTOCH	1389674	392553
$\varphi = 0.075(4.00)$	RRLS-AC	1411679	412941
	TABUSTOCH	1389674	392553
$\varphi = 0.075(8.00)$	RRLS-AC	1411158	412992
	TABUSTOCH	1389674	392553
$\varphi = 0.100(1.00)$	RRLS-AC	1554074	413585
	TABUSTOCH	1553379	386644
$\varphi = 0.100(2.00)$	RRLS-AC	1839151	526549
	TABUSTOCH	1805667	493321
$\varphi = 0.100(4.00)$	RRLS-AC	1839151	526549
	TABUSTOCH	1805667	493321
$\varphi = 0.100(8.00)$	RRLS-AC	1839151	526549
	TABUSTOCH	1805667	493321
$\varphi = 0.150(1.00)$	RRLS-AC	1784023	414720
	TABUSTOCH	1814497	396540
$\varphi = 0.150(2.00)$	RRLS-AC	2570132	709493
	TABUSTOCH	2541821	671605
$\varphi = 0.150(4.00)$	RRLS-AC	2635741	738222
	TABUSTOCH	2623997	694284
$\varphi = 0.150(8.00)$	RRLS-AC	2635741	738222
	TABUSTOCH	2643335	710638
$\varphi = 0.175(1.00)$	RRLS-AC	1885551	411426
	TABUSTOCH	1945321	384157
$\varphi = 0.175(2.00)$	RRLS-AC	2654101	706140
	TABUSTOCH	2655505	669056
$\varphi = 0.175(4.00)$	RRLS-AC	3018331	848700
	TABUSTOCH	3036405	801014
$\varphi = 0.175(8.00)$	RRLS-AC	3018331	848700
	TABUSTOCH	3002092	790617
$\varphi = 0.200(1.00)$	RRLS-AC	1979572	411090
	TABUSTOCH	2065224	410496
$\varphi = 0.200(2.00)$	RRLS-AC	2788108	720290
	TABUSTOCH	2810152	680198
$\varphi = 0.200(4.00)$	RRLS-AC	3388066	952535
	TABUSTOCH	3395059	897444
$\varphi = 0.200(8.00)$	RRLS-AC	3388066	952535
	TABUSTOCH	3395059	897444
$\varphi = 0.300(1.00)$	RRLS-AC	2276718	393857
	TABUSTOCH	2416322	338726
$\varphi = 0.300(2.00)$	RRLS-AC	3108994	705580
	TABUSTOCH	3257856	687400
$\varphi = 0.300(4.00)$	RRLS-AC	4662578	1303063
	TABUSTOCH	4754693	1271918
$\varphi = 0.300(8.00)$	RRLS-AC	4800130	1357364
	TABUSTOCH	4902074	1320723
$\varphi = 0.400(1.00)$	RRLS-AC	2551582	385968
	TABUSTOCH	2849123	391825
$\varphi = 0.400(2.00)$	RRLS-AC	3418118	705470
	TABUSTOCH	3628147	685484
$\varphi = 0.400(4.00)$	RRLS-AC	4962452	1299154
	TABUSTOCH	5178872	1254417
$\varphi = 0.400(8.00)$	RRLS-AC	6148330	1756413
	TABUSTOCH	6309970	1728033
$\varphi = 0.500(1.00)$	RRLS-AC	2782452	379120
	TABUSTOCH	3025038	401352
$\varphi = 0.500(2.00)$	RRLS-AC	3645043	706111
	TABUSTOCH	3984360	678944
$\varphi = 0.500(4.00)$	RRLS-AC	5139265	1267266
	TABUSTOCH	5408212	1226751
$\varphi = 0.500(8.00)$	RRLS-AC	7462920	2157362
	TABUSTOCH	7664400	2116732

Table 2: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 30. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost.
Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.600(1.00)$	RRLS-AC	2996981	383809
	TABUSTOCH	3430433	354310
$\varphi = 0.600(2.00)$	RRLS-AC	3851963	707226
	TABUSTOCH	4145976	670417
$\varphi = 0.600(4.00)$	RRLS-AC	5376100	1244514
	TABUSTOCH	5668377	1229471
$\varphi = 0.600(8.00)$	RRLS-AC	8454398	2421955
	TABUSTOCH	8811526	2348942
$\varphi = 0.700(1.00)$	RRLS-AC	3193406	391309
	TABUSTOCH	3614885	352632
$\varphi = 0.700(2.00)$	RRLS-AC	4049804	703592
	TABUSTOCH	4466112	709685
$\varphi = 0.700(4.00)$	RRLS-AC	5597701	1270618
	TABUSTOCH	5831134	1245842
$\varphi = 0.700(8.00)$	RRLS-AC	8570977	2408750
	TABUSTOCH	8827464	2314450
$\varphi = 0.800(1.00)$	RRLS-AC	3374530	395662
	TABUSTOCH	3856821	372150
$\varphi = 0.800(2.00)$	RRLS-AC	4201273	694057
	TABUSTOCH	4658915	710567
$\varphi = 0.800(4.00)$	RRLS-AC	5792600	1300865
	TABUSTOCH	6209589	1148540
$\varphi = 0.800(8.00)$	RRLS-AC	8881944	2465677
	TABUSTOCH	9170999	2325675
$\varphi = 0.900(1.00)$	RRLS-AC	3532306	395362
	TABUSTOCH	3984318	340937
$\varphi = 0.900(2.00)$	RRLS-AC	4303928	670601
	TABUSTOCH	4838621	700406
$\varphi = 0.900(4.00)$	RRLS-AC	5873845	1269037
	TABUSTOCH	6316755	1134653
$\varphi = 0.900(8.00)$	RRLS-AC	8952319	2425329
	TABUSTOCH	9354201	2386021
$\varphi = 1.000(1.00)$	RRLS-AC	3675993	399980
	TABUSTOCH	4176136	446534
$\varphi = 1.000(2.00)$	RRLS-AC	4372626	647487
	TABUSTOCH	4937140	736848
$\varphi = 1.000(4.00)$	RRLS-AC	5955862	1269165
	TABUSTOCH	6416033	1155228
$\varphi = 1.000(8.00)$	RRLS-AC	8996963	2399439
	TABUSTOCH	9357047	2278739

Table 3: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 100. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-AC	1014761	146491
	TABUSTOCH	1047027	141521
$\varphi = 0.050(2.00)$	RRLS-AC	1434483	269323
	TABUSTOCH	1461542	252075
$\varphi = 0.050(4.00)$	RRLS-AC	1590139	315662
	TABUSTOCH	1602865	307909
$\varphi = 0.050(8.00)$	RRLS-AC	1590139	315662
	TABUSTOCH	1602865	307909
$\varphi = 0.075(1.00)$	RRLS-AC	1182919	137134
	TABUSTOCH	1290538	136464
$\varphi = 0.075(2.00)$	RRLS-AC	1605810	258450
	TABUSTOCH	1676602	250182
$\varphi = 0.075(4.00)$	RRLS-AC	2260955	452198
	TABUSTOCH	2311736	431186
$\varphi = 0.075(8.00)$	RRLS-AC	2260955	452198
	TABUSTOCH	2295393	438672
$\varphi = 0.100(1.00)$	RRLS-AC	1326508	127794
	TABUSTOCH	1479432	141010
$\varphi = 0.100(2.00)$	RRLS-AC	1772184	251726
	TABUSTOCH	1888084	244329
$\varphi = 0.100(4.00)$	RRLS-AC	2588147	492185
	TABUSTOCH	2719150	457593
$\varphi = 0.100(8.00)$	RRLS-AC	2900487	583693
	TABUSTOCH	2985968	553679
$\varphi = 0.150(1.00)$	RRLS-AC	1580647	120499
	TABUSTOCH	1806947	129425
$\varphi = 0.150(2.00)$	RRLS-AC	2035868	236823
	TABUSTOCH	2190241	218532
$\varphi = 0.150(4.00)$	RRLS-AC	2823985	472823
	TABUSTOCH	2972911	433739
$\varphi = 0.150(8.00)$	RRLS-AC	4125001	851598
	TABUSTOCH	4251592	871681
$\varphi = 0.175(1.00)$	RRLS-AC	1692342	118090
	TABUSTOCH	1883043	152252
$\varphi = 0.175(2.00)$	RRLS-AC	2147670	235291
	TABUSTOCH	2399166	235127
$\varphi = 0.175(4.00)$	RRLS-AC	2950887	472506
	TABUSTOCH	3129779	464229
$\varphi = 0.175(8.00)$	RRLS-AC	4565434	940841
	TABUSTOCH	4684523	914415
$\varphi = 0.200(1.00)$	RRLS-AC	1793866	117591
	TABUSTOCH	2069669	202160
$\varphi = 0.200(2.00)$	RRLS-AC	2242699	229504
	TABUSTOCH	2515372	223878
$\varphi = 0.200(4.00)$	RRLS-AC	3065646	470872
	TABUSTOCH	3237201	477055
$\varphi = 0.200(8.00)$	RRLS-AC	4680538	936730
	TABUSTOCH	4815542	915353
$\varphi = 0.300(1.00)$	RRLS-AC	2153273	117697
	TABUSTOCH	2540862	145364
$\varphi = 0.300(2.00)$	RRLS-AC	2571953	208590
	TABUSTOCH	2906090	213525
$\varphi = 0.300(4.00)$	RRLS-AC	3415384	442593
	TABUSTOCH	3720043	437566
$\varphi = 0.300(8.00)$	RRLS-AC	4976840	891608
	TABUSTOCH	5281729	875496
$\varphi = 0.400(1.00)$	RRLS-AC	2444053	122790
	TABUSTOCH	2865884	174813
$\varphi = 0.400(2.00)$	RRLS-AC	2826176	191444
	TABUSTOCH	3272881	214081
$\varphi = 0.400(4.00)$	RRLS-AC	3693787	425921
	TABUSTOCH	3998665	388179
$\varphi = 0.400(8.00)$	RRLS-AC	5299237	881444
	TABUSTOCH	5596427	918253
$\varphi = 0.500(1.00)$	RRLS-AC	2684009	130183
	TABUSTOCH	3117269	173042
$\varphi = 0.500(2.00)$	RRLS-AC	3050451	189750
	TABUSTOCH	3511970	226728
$\varphi = 0.500(4.00)$	RRLS-AC	3945980	421273
	TABUSTOCH	4320747	424856
$\varphi = 0.500(8.00)$	RRLS-AC	5566811	868765
	TABUSTOCH	5864204	892427

Table 4: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 100. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost.
Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.600(1.00)$	RRLS-AC	2903889	134707
	TABUSTOCH	3388856	185886
$\varphi = 0.600(2.00)$	RRLS-AC	3250728	179889
	TABUSTOCH	3806956	240670
$\varphi = 0.600(4.00)$	RRLS-AC	4142620	424330
	TABUSTOCH	4489094	394470
$\varphi = 0.600(8.00)$	RRLS-AC	5755969	850721
	TABUSTOCH	6061654	902177
$\varphi = 0.700(1.00)$	RRLS-AC	3093394	150393
	TABUSTOCH	3627977	217244
$\varphi = 0.700(2.00)$	RRLS-AC	3424869	186709
	TABUSTOCH	3970459	260865
$\varphi = 0.700(4.00)$	RRLS-AC	4316232	416850
	TABUSTOCH	4729168	409104
$\varphi = 0.700(8.00)$	RRLS-AC	5959594	851835
	TABUSTOCH	6361228	910514
$\varphi = 0.800(1.00)$	RRLS-AC	3273157	160161
	TABUSTOCH	3794536	229849
$\varphi = 0.800(2.00)$	RRLS-AC	3578515	181783
	TABUSTOCH	4097526	209787
$\varphi = 0.800(4.00)$	RRLS-AC	4440497	407852
	TABUSTOCH	4877620	344761
$\varphi = 0.800(8.00)$	RRLS-AC	6108506	868815
	TABUSTOCH	6494722	929125
$\varphi = 0.900(1.00)$	RRLS-AC	3411990	166824
	TABUSTOCH	3916825	225848
$\varphi = 0.900(2.00)$	RRLS-AC	3708545	176031
	TABUSTOCH	4310100	234549
$\varphi = 0.900(4.00)$	RRLS-AC	4562907	376410
	TABUSTOCH	5141314	429131
$\varphi = 0.900(8.00)$	RRLS-AC	6248666	856272
	TABUSTOCH	6642433	894255
$\varphi = 1.000(1.00)$	RRLS-AC	3541421	156094
	TABUSTOCH	4121589	271544
$\varphi = 1.000(2.00)$	RRLS-AC	3829934	185949
	TABUSTOCH	4456325	213838
$\varphi = 1.000(4.00)$	RRLS-AC	4651378	365731
	TABUSTOCH	5250615	327149
$\varphi = 1.000(8.00)$	RRLS-AC	6316814	857655
	TABUSTOCH	6791868	885054

Table 5: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 300. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-AC	2350715	673348
	TABUSTOCH	2601556	618009
$\varphi = 0.050(2.00)$	RRLS-AC	3145408	945598
	TABUSTOCH	3289843	901482
$\varphi = 0.050(4.00)$	RRLS-AC	4624880	1437154
	TABUSTOCH	4743378	1353987
$\varphi = 0.050(8.00)$	RRLS-AC	7052468	2302598
	TABUSTOCH	6909529	1874339
$\varphi = 0.075(1.00)$	RRLS-AC	2592915	672784
	TABUSTOCH	2865451	661737
$\varphi = 0.075(2.00)$	RRLS-AC	3400984	969176
	TABUSTOCH	3588598	807850
$\varphi = 0.075(4.00)$	RRLS-AC	4887661	1443073
	TABUSTOCH	5070757	1389185
$\varphi = 0.075(8.00)$	RRLS-AC	7740609	2462183
	TABUSTOCH	7968456	2365877
$\varphi = 0.100(1.00)$	RRLS-AC	2811047	673268
	TABUSTOCH	3333844	671982
$\varphi = 0.100(2.00)$	RRLS-AC	3624506	987024
	TABUSTOCH	4027019	916463
$\varphi = 0.100(4.00)$	RRLS-AC	5147063	1462102
	TABUSTOCH	5399245	1425617
$\varphi = 0.100(8.00)$	RRLS-AC	8040384	2483509
	TABUSTOCH	8288467	2407449
$\varphi = 0.150(1.00)$	RRLS-AC	3200128	675262
	TABUSTOCH	3771494	700070
$\varphi = 0.150(2.00)$	RRLS-AC	3998798	1010395
	TABUSTOCH	4512207	934509
$\varphi = 0.150(4.00)$	RRLS-AC	5524487	1462704
	TABUSTOCH	5964555	1465196
$\varphi = 0.150(8.00)$	RRLS-AC	8415059	2472910
	TABUSTOCH	8823712	2357124
$\varphi = 0.175(1.00)$	RRLS-AC	3376767	677147
	TABUSTOCH	3938519	663470
$\varphi = 0.175(2.00)$	RRLS-AC	4175700	1015545
	TABUSTOCH	4797378	971797
$\varphi = 0.175(4.00)$	RRLS-AC	5717762	1462713
	TABUSTOCH	6160363	1374829
$\varphi = 0.175(8.00)$	RRLS-AC	8630607	2489422
	TABUSTOCH	9049445	2425129
$\varphi = 0.200(1.00)$	RRLS-AC	3545258	679745
	TABUSTOCH	4137967	700285
$\varphi = 0.200(2.00)$	RRLS-AC	4327041	1023470
	TABUSTOCH	5017557	987598
$\varphi = 0.200(4.00)$	RRLS-AC	5877211	1462494
	TABUSTOCH	6413629	1388494
$\varphi = 0.200(8.00)$	RRLS-AC	8829040	2501264
	TABUSTOCH	9402873	2440478
$\varphi = 0.300(1.00)$	RRLS-AC	4131994	693057
	TABUSTOCH	4958054	775659
$\varphi = 0.300(2.00)$	RRLS-AC	4878003	1027921
	TABUSTOCH	5697621	1034358
$\varphi = 0.300(4.00)$	RRLS-AC	6432957	1474954
	TABUSTOCH	7171356	1511446
$\varphi = 0.300(8.00)$	RRLS-AC	9376345	2505299
	TABUSTOCH	10053605	2455117
$\varphi = 0.400(1.00)$	RRLS-AC	4618813	711598
	TABUSTOCH	5421309	756426
$\varphi = 0.400(2.00)$	RRLS-AC	5319545	1046138
	TABUSTOCH	6285426	1142019
$\varphi = 0.400(4.00)$	RRLS-AC	6888259	1469820
	TABUSTOCH	7616657	1544296
$\varphi = 0.400(8.00)$	RRLS-AC	9871309	2511657
	TABUSTOCH	10568195	2461284
$\varphi = 0.500(1.00)$	RRLS-AC	5019262	721206
	TABUSTOCH	5973635	761338
$\varphi = 0.500(2.00)$	RRLS-AC	5666102	945943
	TABUSTOCH	6799185	1156599
$\varphi = 0.500(4.00)$	RRLS-AC	7250230	1464797
	TABUSTOCH	8049462	1547522
$\varphi = 0.500(8.00)$	RRLS-AC	10276908	2531315
	TABUSTOCH	11129734	2553982

Table 6: Comparison of the average cost obtained by RRLS-AC and TABUSTOCH on clustered instances of size 300. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost.
Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.600(1.00)$	RRLS-AC	5387295	725458
	TABUSTOCH	6376572	799371
$\varphi = 0.600(2.00)$	RRLS-AC	6031968	1089628
	TABUSTOCH	7117056	1185034
$\varphi = 0.600(4.00)$	RRLS-AC	7548806	1481651
	TABUSTOCH	8463719	1519170
$\varphi = 0.600(8.00)$	RRLS-AC	10592259	2523928
	TABUSTOCH	11409110	2610677
$\varphi = 0.700(1.00)$	RRLS-AC	5698123	738732
	TABUSTOCH	6594384	934860
$\varphi = 0.700(2.00)$	RRLS-AC	6329308	1086716
	TABUSTOCH	7432231	1163421
$\varphi = 0.700(4.00)$	RRLS-AC	7837568	1480166
	TABUSTOCH	8772347	1492674
$\varphi = 0.700(8.00)$	RRLS-AC	10885473	2542070
	TABUSTOCH	11714644	2715408
$\varphi = 0.800(1.00)$	RRLS-AC	5969595	765227
	TABUSTOCH	6928120	807835
$\varphi = 0.800(2.00)$	RRLS-AC	6568931	1014012
	TABUSTOCH	7760532	1242787
$\varphi = 0.800(4.00)$	RRLS-AC	8042204	1463799
	TABUSTOCH	9083793	1496324
$\varphi = 0.800(8.00)$	RRLS-AC	11097816	2523227
	TABUSTOCH	11938577	2662800
$\varphi = 0.900(1.00)$	RRLS-AC	6212337	774172
	TABUSTOCH	7060524	922209
$\varphi = 0.900(2.00)$	RRLS-AC	6774590	991229
	TABUSTOCH	8114041	1196189
$\varphi = 0.900(4.00)$	RRLS-AC	8256784	1500115
	TABUSTOCH	9309395	1548754
$\varphi = 0.900(8.00)$	RRLS-AC	11305663	2512721
	TABUSTOCH	11826121	2332780
$\varphi = 1.000(1.00)$	RRLS-AC	6418406	794760
	TABUSTOCH	7506335	934118
$\varphi = 1.000(2.00)$	RRLS-AC	6990770	1014724
	TABUSTOCH	8338738	1198714
$\varphi = 1.000(4.00)$	RRLS-AC	8402871	1498489
	TABUSTOCH	9522900	1373937
$\varphi = 1.000(8.00)$	RRLS-AC	11437235	2538356
	TABUSTOCH	12252975	2208634

Table 7: Comparison of the average cost obtained by RRLS-AC and TABUS-TOCH on clustered instances of size 30. The table gives, for each probability level, the 95% CI of the final solution cost.

0.100(1.00)	+0.04	[-1.53, +1.62]
0.100(2.00)	+1.85	[+0.58, +3.13]
0.100(4.00)	+1.85	[+0.58, +3.13]
0.100(8.00)	+1.85	[+0.58, +3.13]
0.200(1.00)	-2.94	[-5.34, -0.53]
0.200(2.00)	-0.78	[-2.24, +0.67]
0.200(4.00)	-0.21	[-2.38, +1.97]
0.200(8.00)	-0.21	[-2.38, +1.97]
0.300(1.00)	-5.78	[-10.31, -1.24]
0.300(2.00)	-4.57	[-7.29, -1.85]
0.300(4.00)	-1.94	[-3.68, -0.20]
0.300(8.00)	-2.08	[-3.46, -0.70]
0.500(1.00)	-8.02	[-13.34, -2.70]
0.500(2.00)	-8.52	[-12.17, -4.87]
0.500(4.00)	-4.97	[-6.99, -2.95]
0.500(8.00)	-2.63	[-3.70, -1.56]
0.800(1.00)	-12.46	[-18.41, -6.50]
0.800(2.00)	-9.16	[-14.19, -4.13]
0.800(4.00)	-6.72	[-9.60, -3.83]
0.800(8.00)	-3.15	[-4.58, -1.72]
1.000(1.00)	-11.98	[-16.36, -7.59]
1.000(2.00)	-11.43	[-17.35, -5.52]
1.000(4.00)	-7.17	[-10.55, -3.80]
1.000(8.00)	-3.85	[-5.38, -2.31]

Table 8: Comparison of the average cost obtained by RRLS-AC and TABUS-TOCH on clustered instances of size 100. The table gives, for each probability level, the 95% CI of the final solution cost. The order of probability levels is the same as that of the previous table

-10.32	[-15.37, -5.27]
-6.14	[-8.84, -3.43]
-3.56	[-5.57, -1.55]
-2.86	[-4.61, -1.11]
-12.67	[-18.44, -6.91]
-10.84	[-14.17, -7.51]
-5.30	[-7.28, -3.32]
-2.80	[-3.84, -1.77]
-14.89	[-18.73, -11.05]
-11.50	[-13.03, -9.97]
-7.36	[-8.94, -5.77]
-4.68	[-5.83, -3.53]
-13.90	[-17.28, -10.51]
-13.14	[-16.05, -10.23]
-8.67	[-10.45, -6.90]
-5.07	[-6.55, -3.59]
-13.74	[-17.25, -10.23]
-13.30	[-16.02, -10.57]
-8.96	[-10.87, -7.05]
-5.95	[-7.74, -4.15]
-14.08	[-17.46, -10.70]
-14.06	[-16.53, -11.58]
-11.41	[-12.94, -9.89]
-6.99	[-9.18, -4.81]

Table 9: Comparison of the average cost obtained by RRLS-AC and TABUS-TOCH on clustered instances of size 300. The table gives, for each probability level, the 95% CI of the final solution cost. The order of probability levels is the same as that of the previous table

-12.58	[-14.37, -10.78]
-10.00	[-12.88, -7.11]
-4.94	[-6.66, -3.22]
-3.40	[-4.39, -2.41]
-14.32	[-17.21, -11.44]
-13.76	[-17.23, -10.29]
-8.36	[-9.44, -7.28]
-5.36	[-6.35, -4.36]
-15.76	[-18.48, -13.05]
-14.39	[-17.82, -10.95]
-9.86	[-11.39, -8.33]
-6.74	[-7.53, -5.94]
-14.69	[-18.57, -10.81]
-16.27	[-20.41, -12.14]
-10.09	[-11.53, -8.65]
-6.55	[-7.76, -5.34]
-12.56	[-15.64, -9.48]
-15.39	[-18.91, -11.86]
-11.47	[-12.93, -10.00]
-7.17	[-8.51, -5.82]
-14.49	[-17.41, -11.57]
-16.17	[-18.72, -13.61]
-13.49	[-16.33, -10.66]
-8.92	[-11.06, -6.79]

2 Effectiveness of ANOVA-Race

Table 10: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 100. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-EE	952507	58004
	RRLS-AC	952207	57945
	RRLS-EE(PTSP)	954640	57462
$\varphi = 0.050(2.00)$	RRLS-EE	1333938	106310
	RRLS-AC	1333822	106190
	RRLS-EE(PTSP)	1336845	105090
$\varphi = 0.050(4.00)$	RRLS-EE	1474623	125553
	RRLS-AC	1474197	125660
	RRLS-EE(PTSP)	1477880	124907
$\varphi = 0.050(8.00)$	RRLS-EE	1474623	125553
	RRLS-AC	1474197	125660
	RRLS-EE(PTSP)	1477880	124907
$\varphi = 0.075(1.00)$	RRLS-EE	1116747	55967
	RRLS-AC	1116579	55804
	RRLS-EE(PTSP)	1119963	57205
$\varphi = 0.075(2.00)$	RRLS-EE	1499196	93785
	RRLS-AC	1498989	93974
	RRLS-EE(PTSP)	1505500	97532
$\varphi = 0.075(4.00)$	RRLS-EE	2094983	175330
	RRLS-AC	2094322	173291
	RRLS-EE(PTSP)	2102154	175052
$\varphi = 0.075(8.00)$	RRLS-EE	2094983	175330
	RRLS-AC	2094322	173291
	RRLS-EE(PTSP)	2102154	175052
$\varphi = 0.100(1.00)$	RRLS-EE	1259532	61457
	RRLS-AC	1258981	61438
	RRLS-EE(PTSP)	1261669	61650
$\varphi = 0.100(2.00)$	RRLS-EE	1661775	91799
	RRLS-AC	1660838	92234
	RRLS-EE(PTSP)	1668030	92143
$\varphi = 0.100(4.00)$	RRLS-EE	2402376	187942
	RRLS-AC	2401722	188211
	RRLS-EE(PTSP)	2407957	185464
$\varphi = 0.100(8.00)$	RRLS-EE	2683401	226430
	RRLS-AC	2683276	227579
	RRLS-EE(PTSP)	2689750	223672
$\varphi = 0.150(1.00)$	RRLS-EE	1508852	80129
	RRLS-AC	1508120	80158
	RRLS-EE(PTSP)	1512219	79600
$\varphi = 0.150(2.00)$	RRLS-EE	1913994	94239
	RRLS-AC	1914107	94093
	RRLS-EE(PTSP)	1925604	94938
$\varphi = 0.150(4.00)$	RRLS-EE	2633294	177267
	RRLS-AC	2632685	176812
	RRLS-EE(PTSP)	2641471	176391
$\varphi = 0.150(8.00)$	RRLS-EE	3810679	333372
	RRLS-AC	3809862	333583
	RRLS-EE(PTSP)	3818195	332960
$\varphi = 0.175(1.00)$	RRLS-EE	1615373	88381
	RRLS-AC	1615139	88616
	RRLS-EE(PTSP)	1620497	88842
$\varphi = 0.175(2.00)$	RRLS-EE	2030201	97101
	RRLS-AC	2029633	96694
	RRLS-EE(PTSP)	2048381	106454
$\varphi = 0.175(4.00)$	RRLS-EE	2755032	177901
	RRLS-AC	2755067	177983
	RRLS-EE(PTSP)	2762611	178261
$\varphi = 0.175(8.00)$	RRLS-EE	4219117	368057
	RRLS-AC	4219324	368083
	RRLS-EE(PTSP)	4224144	369559
$\varphi = 0.200(1.00)$	RRLS-EE	1714652	97988
	RRLS-AC	1714270	97773
	RRLS-EE(PTSP)	1721802	99732
$\varphi = 0.200(2.00)$	RRLS-EE	2127529	102523
	RRLS-AC	2126762	101489
	RRLS-EE(PTSP)	2151583	113155
$\varphi = 0.200(4.00)$	RRLS-EE	2868069	176947
	RRLS-AC	2868401	177487
	RRLS-EE(PTSP)	2874565	176793
$\varphi = 0.200(8.00)$	RRLS-EE	4330781	363618
	RRLS-AC	4330278	363817
	RRLS-EE(PTSP)	4333013	365213

Table 11: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 100. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.300(1.00)$	RRLS-EE	2066566	134496
	RRLS-AC	2068185	133729
	RRLS-EE(PTSP)	2073532	138851
$\varphi = 0.300(2.00)$	RRLS-EE	2455663	122891
	RRLS-AC	2456958	123319
	RRLS-EE(PTSP)	2517227	134023
$\varphi = 0.300(4.00)$	RRLS-EE	3215424	174650
	RRLS-AC	3217864	172610
	RRLS-EE(PTSP)	3230964	177842
$\varphi = 0.300(8.00)$	RRLS-EE	4632219	339892
	RRLS-AC	4632906	339160
	RRLS-EE(PTSP)	4635220	341752
$\varphi = 0.400(1.00)$	RRLS-EE	2347717	168644
	RRLS-AC	2350841	171577
	RRLS-EE(PTSP)	2353783	170018
$\varphi = 0.400(2.00)$	RRLS-EE	2707491	147016
	RRLS-AC	2711009	148565
	RRLS-EE(PTSP)	2791298	166126
$\varphi = 0.400(4.00)$	RRLS-EE	3497926	177041
	RRLS-AC	3499065	176603
	RRLS-EE(PTSP)	3529144	180479
$\varphi = 0.400(8.00)$	RRLS-EE	4955913	341028
	RRLS-AC	4955339	340083
	RRLS-EE(PTSP)	4959953	339208
$\varphi = 0.500(1.00)$	RRLS-EE	2597152	200146
	RRLS-AC	2600730	198781
	RRLS-EE(PTSP)	2599708	198909
$\varphi = 0.500(2.00)$	RRLS-EE	2925973	186792
	RRLS-AC	2927774	188540
	RRLS-EE(PTSP)	3033889	184329
$\varphi = 0.500(4.00)$	RRLS-EE	3735816	189645
	RRLS-AC	3740017	190018
	RRLS-EE(PTSP)	3804196	195837
$\varphi = 0.500(8.00)$	RRLS-EE	5214081	342093
	RRLS-AC	5218660	338185
	RRLS-EE(PTSP)	5229332	335110
$\varphi = 0.600(1.00)$	RRLS-EE	2812826	221947
	RRLS-AC	2821012	226392
	RRLS-EE(PTSP)	2819205	219598
$\varphi = 0.600(2.00)$	RRLS-EE	3125804	210735
	RRLS-AC	3131308	210597
	RRLS-EE(PTSP)	3224988	253325
$\varphi = 0.600(4.00)$	RRLS-EE	3927907	211985
	RRLS-AC	3937116	214672
	RRLS-EE(PTSP)	3988878	205195
$\varphi = 0.600(8.00)$	RRLS-EE	5403464	352004
	RRLS-AC	5412358	358576
	RRLS-EE(PTSP)	5426110	352051
$\varphi = 0.700(1.00)$	RRLS-EE	3002588	246046
	RRLS-AC	3014257	243756
	RRLS-EE(PTSP)	3011391	243809
$\varphi = 0.700(2.00)$	RRLS-EE	3292150	235244
	RRLS-AC	3305587	242326
	RRLS-EE(PTSP)	3427179	287972
$\varphi = 0.700(4.00)$	RRLS-EE	4096566	242270
	RRLS-AC	4104183	236227
	RRLS-EE(PTSP)	4207542	240684
$\varphi = 0.700(8.00)$	RRLS-EE	5593309	360749
	RRLS-AC	5608418	369478
	RRLS-EE(PTSP)	5629123	356798
$\varphi = 0.800(1.00)$	RRLS-EE	3174895	264043
	RRLS-AC	3180218	260464
	RRLS-EE(PTSP)	3178137	268324
$\varphi = 0.800(2.00)$	RRLS-EE	3431008	260793
	RRLS-AC	3441917	257806
	RRLS-EE(PTSP)	3599905	264751
$\varphi = 0.800(4.00)$	RRLS-EE	4220862	268262
	RRLS-AC	4231700	263485
	RRLS-EE(PTSP)	4398574	259998
$\varphi = 0.800(8.00)$	RRLS-EE	5729561	390050
	RRLS-AC	5733745	388435
	RRLS-EE(PTSP)	5779817	375261

Table 12: Comparison of the average cost obtained by **RRLS-EE**, **RRLS-AC**, and **RRLS-EE(PTSP)** on clustered instances of size 100. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-III

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.900(1.00)$	RRLS-EE	3319021	278230
	RRLS-AC	3323130	276142
	RRLS-EE(PTSP)	3321181	282067
$\varphi = 0.900(2.00)$	RRLS-EE	3561692	288125
	RRLS-AC	3585125	282569
	RRLS-EE(PTSP)	3746506	240002
$\varphi = 0.900(4.00)$	RRLS-EE	4330165	272685
	RRLS-AC	4346620	276243
	RRLS-EE(PTSP)	4534926	352138
$\varphi = 0.900(8.00)$	RRLS-EE	5865477	403458
	RRLS-AC	5875685	414253
	RRLS-EE(PTSP)	5929415	413111
$\varphi = 1.000(1.00)$	RRLS-EE	3463436	297045
	RRLS-AC	3468952	302411
	RRLS-EE(PTSP)	3467674	301452
$\varphi = 1.000(2.00)$	RRLS-EE	3655137	306265
	RRLS-AC	3676816	312581
	RRLS-EE(PTSP)	3844588	280736
$\varphi = 1.000(4.00)$	RRLS-EE	4392375	279978
	RRLS-AC	4444583	275191
	RRLS-EE(PTSP)	4606367	337949
$\varphi = 1.000(8.00)$	RRLS-EE	5901281	410623
	RRLS-AC	5911483	411880
	RRLS-EE(PTSP)	6102873	378063

Table 13: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 300. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-EE	2794756	476558
	RRLS-AC	2795022	476886
	RRLS-EE(PTSP)	2807926	480052
$\varphi = 0.050(2.00)$	RRLS-EE	3916957	820586
	RRLS-AC	3917784	821031
	RRLS-EE(PTSP)	3974827	823200
$\varphi = 0.050(4.00)$	RRLS-EE	5790770	1255641
	RRLS-AC	5791239	1255298
	RRLS-EE(PTSP)	5928187	1325341
$\varphi = 0.050(8.00)$	RRLS-EE	8878321	2073416
	RRLS-AC	8877485	2074912
	RRLS-EE(PTSP)	9047512	2173097
$\varphi = 0.075(1.00)$	RRLS-EE	3007567	458923
	RRLS-AC	3008517	458420
	RRLS-EE(PTSP)	3021581	458888
$\varphi = 0.075(2.00)$	RRLS-EE	4175076	838379
	RRLS-AC	4185982	840674
	RRLS-EE(PTSP)	4244179	833287
$\varphi = 0.075(4.00)$	RRLS-EE	6142423	1309322
	RRLS-AC	6142643	1309386
	RRLS-EE(PTSP)	6216592	1326426
$\varphi = 0.075(8.00)$	RRLS-EE	9777894	2252893
	RRLS-AC	9777599	2253146
	RRLS-EE(PTSP)	9867051	2319909
$\varphi = 0.100(1.00)$	RRLS-EE	3204219	448915
	RRLS-AC	3204993	450300
	RRLS-EE(PTSP)	3220592	446814
$\varphi = 0.100(2.00)$	RRLS-EE	4354712	841989
	RRLS-AC	4384348	841523
	RRLS-EE(PTSP)	4473377	837082
$\varphi = 0.100(4.00)$	RRLS-EE	6436068	1360324
	RRLS-AC	6454654	1352584
	RRLS-EE(PTSP)	6514806	1344061
$\varphi = 0.100(8.00)$	RRLS-EE	10150609	2332652
	RRLS-AC	10154984	2320746
	RRLS-EE(PTSP)	10211532	2344859
$\varphi = 0.150(1.00)$	RRLS-EE	3566487	434708
	RRLS-AC	3567807	435433
	RRLS-EE(PTSP)	3604250	467602
$\varphi = 0.150(2.00)$	RRLS-EE	4659822	822415
	RRLS-AC	4679350	817752
	RRLS-EE(PTSP)	4824987	886403
$\varphi = 0.150(4.00)$	RRLS-EE	6777652	1329955
	RRLS-AC	6793725	1323287
	RRLS-EE(PTSP)	6906970	1393604
$\varphi = 0.150(8.00)$	RRLS-EE	10541512	2356500
	RRLS-AC	10553690	2341557
	RRLS-EE(PTSP)	10593610	2351130
$\varphi = 0.175(1.00)$	RRLS-EE	3740393	435217
	RRLS-AC	3742632	436737
	RRLS-EE(PTSP)	3764698	444035
$\varphi = 0.175(2.00)$	RRLS-EE	4808538	819079
	RRLS-AC	4832924	813330
	RRLS-EE(PTSP)	5041567	853854
$\varphi = 0.175(4.00)$	RRLS-EE	6957070	1328481
	RRLS-AC	6990272	1335642
	RRLS-EE(PTSP)	7122088	1362284
$\varphi = 0.175(8.00)$	RRLS-EE	10753751	2356475
	RRLS-AC	10786097	2362546
	RRLS-EE(PTSP)	10825645	2358772
$\varphi = 0.200(1.00)$	RRLS-EE	3904113	433291
	RRLS-AC	3911249	436263
	RRLS-EE(PTSP)	3927794	438021
$\varphi = 0.200(2.00)$	RRLS-EE	4930568	813031
	RRLS-AC	4944272	819731
	RRLS-EE(PTSP)	5115942	825422
$\varphi = 0.200(4.00)$	RRLS-EE	7112960	1309082
	RRLS-AC	7151965	1332775
	RRLS-EE(PTSP)	7264251	1339467
$\varphi = 0.200(8.00)$	RRLS-EE	10968316	2362451
	RRLS-AC	10994506	2392388
	RRLS-EE(PTSP)	11034699	2374515

Table 14: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 300. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.300(1.00)$	RRLS-EE	4475337	437764
	RRLS-AC	4497677	440957
	RRLS-EE(PTSP)	4496037	444198
$\varphi = 0.300(2.00)$	RRLS-EE	5430735	842546
	RRLS-AC	5467113	831726
	RRLS-EE(PTSP)	5574427	843177
$\varphi = 0.300(4.00)$	RRLS-EE	7626874	1317065
	RRLS-AC	7659950	1315320
	RRLS-EE(PTSP)	7834258	1437132
$\varphi = 0.300(8.00)$	RRLS-EE	11473066	2352775
	RRLS-AC	11487916	2345956
	RRLS-EE(PTSP)	11551175	2385796
$\varphi = 0.400(1.00)$	RRLS-EE	4951132	450390
	RRLS-AC	4968248	448552
	RRLS-EE(PTSP)	4972270	462462
$\varphi = 0.400(2.00)$	RRLS-EE	5808245	835480
	RRLS-AC	5875514	845658
	RRLS-EE(PTSP)	6166589	872845
$\varphi = 0.400(4.00)$	RRLS-EE	8035887	1296149
	RRLS-AC	8073865	1286660
	RRLS-EE(PTSP)	8229573	1443501
$\varphi = 0.400(8.00)$	RRLS-EE	11952648	2355342
	RRLS-AC	11985381	2360704
	RRLS-EE(PTSP)	12082878	2425982
$\varphi = 0.500(1.00)$	RRLS-EE	5366467	450911
	RRLS-AC	5383040	444466
	RRLS-EE(PTSP)	5378286	443496
$\varphi = 0.500(2.00)$	RRLS-EE	6165169	772539
	RRLS-AC	6266987	852121
	RRLS-EE(PTSP)	6604752	887215
$\varphi = 0.500(4.00)$	RRLS-EE	8362275	1288650
	RRLS-AC	8430827	1274079
	RRLS-EE(PTSP)	8727147	1383365
$\varphi = 0.500(8.00)$	RRLS-EE	12341656	2357564
	RRLS-AC	12380533	2363751
	RRLS-EE(PTSP)	12447409	2374769
$\varphi = 0.600(1.00)$	RRLS-EE	5720583	457628
	RRLS-AC	5740165	457280
	RRLS-EE(PTSP)	5731388	453042
$\varphi = 0.600(2.00)$	RRLS-EE	6446995	820281
	RRLS-AC	6548890	887569
	RRLS-EE(PTSP)	6911042	1027811
$\varphi = 0.600(4.00)$	RRLS-EE	8692856	1291362
	RRLS-AC	8727496	1265695
	RRLS-EE(PTSP)	8940157	1460609
$\varphi = 0.600(8.00)$	RRLS-EE	12644954	2351343
	RRLS-AC	12673700	2374792
	RRLS-EE(PTSP)	12778907	2389196

Table 15: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 300. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-III

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.700(1.00)$	RRLS-EE	6041978	460599
	RRLS-AC	6058710	448298
	RRLS-EE(PTSP)	6042807	461418
$\varphi = 0.700(2.00)$	RRLS-EE	6721589	751959
	RRLS-AC	6870545	876587
	RRLS-EE(PTSP)	7208223	998824
$\varphi = 0.700(4.00)$	RRLS-EE	8957971	1268542
	RRLS-AC	8995801	1262312
	RRLS-EE(PTSP)	9274630	1415624
$\varphi = 0.700(8.00)$	RRLS-EE	12919608	2343680
	RRLS-AC	12929522	2330179
	RRLS-EE(PTSP)	13107016	2437111
$\varphi = 0.800(1.00)$	RRLS-EE	6319849	455806
	RRLS-AC	6321370	454783
	RRLS-EE(PTSP)	6328092	456295
$\varphi = 0.800(2.00)$	RRLS-EE	6949377	736709
	RRLS-AC	7087888	898160
	RRLS-EE(PTSP)	7638904	818979
$\varphi = 0.800(4.00)$	RRLS-EE	9170442	1282307
	RRLS-AC	9184066	1274926
	RRLS-EE(PTSP)	9663663	1342534
$\varphi = 0.800(8.00)$	RRLS-EE	13120754	2326333
	RRLS-AC	13121999	2324040
	RRLS-EE(PTSP)	13352999	2430352
$\varphi = 0.900(1.00)$	RRLS-EE	6560954	462861
	RRLS-AC	6562164	462090
	RRLS-EE(PTSP)	6562862	464045
$\varphi = 0.900(2.00)$	RRLS-EE	7163722	720032
	RRLS-AC	7311075	899496
	RRLS-EE(PTSP)	7635208	892837
$\varphi = 0.900(4.00)$	RRLS-EE	9393488	1275268
	RRLS-AC	9398647	1274551
	RRLS-EE(PTSP)	9898171	1484082
$\varphi = 0.900(8.00)$	RRLS-EE	13280059	2310053
	RRLS-AC	13319184	2304195
	RRLS-EE(PTSP)	13633878	2430082
$\varphi = 1.000(1.00)$	RRLS-EE	6758577	453475
	RRLS-AC	6761678	451583
	RRLS-EE(PTSP)	6774598	439788
$\varphi = 1.000(2.00)$	RRLS-EE	7405175	726244
	RRLS-AC	7512689	867958
	RRLS-EE(PTSP)	8054960	923879
$\varphi = 1.000(4.00)$	RRLS-EE	9510527	1228183
	RRLS-AC	9518274	1221307
	RRLS-EE(PTSP)	9928021	1299123
$\varphi = 1.000(8.00)$	RRLS-EE	13303158	2295554
	RRLS-AC	13349396	2293750
	RRLS-EE(PTSP)	13678444	2379695

Table 16: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 1000. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-I

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.050(1.00)$	RRLS-EE	4254575	242515
	RRLS-AC	4257974	243470
	RRLS-EE(PTSP)	4267682	245200
$\varphi = 0.050(2.00)$	RRLS-EE	5428662	410831
	RRLS-AC	5442777	409437
	RRLS-EE(PTSP)	5529363	453697
$\varphi = 0.050(4.00)$	RRLS-EE	7673314	846040
	RRLS-AC	7685995	838696
	RRLS-EE(PTSP)	7750098	882758
$\varphi = 0.050(8.00)$	RRLS-EE	11840385	1831020
	RRLS-AC	11860949	1828086
	RRLS-EE(PTSP)	11897914	1849647
$\varphi = 0.075(1.00)$	RRLS-EE	4725544	249590
	RRLS-AC	4733382	248262
	RRLS-EE(PTSP)	4744129	247917
$\varphi = 0.075(2.00)$	RRLS-EE	5853944	422419
	RRLS-AC	5873192	424425
	RRLS-EE(PTSP)	6056158	497567
$\varphi = 0.075(4.00)$	RRLS-EE	8136396	841482
	RRLS-AC	8163380	840000
	RRLS-EE(PTSP)	8256674	875722
$\varphi = 0.075(8.00)$	RRLS-EE	12327545	1824793
	RRLS-AC	12336037	1823327
	RRLS-EE(PTSP)	12431808	1833058
$\varphi = 0.100(1.00)$	RRLS-EE	5157462	255919
	RRLS-AC	5169257	253155
	RRLS-EE(PTSP)	5180761	252212
$\varphi = 0.100(2.00)$	RRLS-EE	6254140	424387
	RRLS-AC	6275133	420619
	RRLS-EE(PTSP)	6503120	487871
$\varphi = 0.100(4.00)$	RRLS-EE	8576930	834677
	RRLS-AC	8608258	838333
	RRLS-EE(PTSP)	8723610	878505
$\varphi = 0.100(8.00)$	RRLS-EE	12759160	1821225
	RRLS-AC	12792405	1819554
	RRLS-EE(PTSP)	12906011	1829531
$\varphi = 0.150(1.00)$	RRLS-EE	5902080	274603
	RRLS-AC	5943753	269383
	RRLS-EE(PTSP)	5937656	261166
$\varphi = 0.150(2.00)$	RRLS-EE	6974426	433629
	RRLS-AC	7057001	424793
	RRLS-EE(PTSP)	7259621	467272
$\varphi = 0.150(4.00)$	RRLS-EE	9311302	823985
	RRLS-AC	9384212	861054
	RRLS-EE(PTSP)	9537445	840909
$\varphi = 0.150(8.00)$	RRLS-EE	13484651	1793295
	RRLS-AC	13544295	1798205
	RRLS-EE(PTSP)	13638594	1776588
$\varphi = 0.175(1.00)$	RRLS-EE	6247417	276105
	RRLS-AC	6295423	281180
	RRLS-EE(PTSP)	6271224	274195
$\varphi = 0.175(2.00)$	RRLS-EE	7298723	425348
	RRLS-AC	7358979	449142
	RRLS-EE(PTSP)	7575982	494393
$\varphi = 0.175(4.00)$	RRLS-EE	9643236	839454
	RRLS-AC	9733918	847710
	RRLS-EE(PTSP)	9868324	866136
$\varphi = 0.175(8.00)$	RRLS-EE	13832273	1766867
	RRLS-AC	13893006	1822086
	RRLS-EE(PTSP)	14013987	1794589
$\varphi = 0.200(1.00)$	RRLS-EE	6557981	284214
	RRLS-AC	6619976	280577
	RRLS-EE(PTSP)	6573849	281057
$\varphi = 0.200(2.00)$	RRLS-EE	7617714	424875
	RRLS-AC	7686598	435439
	RRLS-EE(PTSP)	7926333	521556
$\varphi = 0.200(4.00)$	RRLS-EE	9940964	843179
	RRLS-AC	10028627	841383
	RRLS-EE(PTSP)	10161842	822585
$\varphi = 0.200(8.00)$	RRLS-EE	14154218	1779118
	RRLS-AC	14236962	1801595
	RRLS-EE(PTSP)	14328284	1761455

Table 17: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 1000. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-II

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.300(1.00)$	RRLS-EE	7662612	300761
	RRLS-AC	7719226	315439
	RRLS-EE(PTSP)	7680969	294032
$\varphi = 0.300(2.00)$	RRLS-EE	8679880	436802
	RRLS-AC	8772284	372346
	RRLS-EE(PTSP)	9011992	494139
$\varphi = 0.300(4.00)$	RRLS-EE	10991010	850905
	RRLS-AC	11084141	826307
	RRLS-EE(PTSP)	11261607	841438
$\varphi = 0.300(8.00)$	RRLS-EE	15231819	1755264
	RRLS-AC	15281262	1742035
	RRLS-EE(PTSP)	15419317	1780949
$\varphi = 0.400(1.00)$	RRLS-EE	8549296	330058
	RRLS-AC	8626636	341380
	RRLS-EE(PTSP)	8561861	328588
$\varphi = 0.400(2.00)$	RRLS-EE	9514823	454649
	RRLS-AC	9606897	432182
	RRLS-EE(PTSP)	9860023	495216
$\varphi = 0.400(4.00)$	RRLS-EE	11832845	834341
	RRLS-AC	11974187	806194
	RRLS-EE(PTSP)	12123986	856580
$\varphi = 0.400(8.00)$	RRLS-EE	16089067	1736918
	RRLS-AC	16218093	1757953
	RRLS-EE(PTSP)	16291235	1803129
$\varphi = 0.500(1.00)$	RRLS-EE	9282292	368601
	RRLS-AC	9359994	335093
	RRLS-EE(PTSP)	9291780	382389
$\varphi = 0.500(2.00)$	RRLS-EE	10209657	429771
	RRLS-AC	10336282	482163
	RRLS-EE(PTSP)	10592010	548714
$\varphi = 0.500(4.00)$	RRLS-EE	12490655	856218
	RRLS-AC	12635735	884137
	RRLS-EE(PTSP)	12951097	928720
$\varphi = 0.500(8.00)$	RRLS-EE	16808428	1750390
	RRLS-AC	16953323	1784987
	RRLS-EE(PTSP)	17113476	1883278
$\varphi = 0.600(1.00)$	RRLS-EE	9899148	376571
	RRLS-AC	9997001	378335
	RRLS-EE(PTSP)	9902768	378902
$\varphi = 0.600(2.00)$	RRLS-EE	10815115	461185
	RRLS-AC	10970700	509332
	RRLS-EE(PTSP)	11124206	604173
$\varphi = 0.600(4.00)$	RRLS-EE	13111743	846486
	RRLS-AC	13319610	788488
	RRLS-EE(PTSP)	13464668	860074
$\varphi = 0.600(8.00)$	RRLS-EE	17370428	1788385
	RRLS-AC	17547110	1767825
	RRLS-EE(PTSP)	17659841	1863791
$\varphi = 0.700(1.00)$	RRLS-EE	10435516	393616
	RRLS-AC	10550989	407061
	RRLS-EE(PTSP)	10435516	393616
$\varphi = 0.700(2.00)$	RRLS-EE	11386026	483056
	RRLS-AC	11510285	487769
	RRLS-EE(PTSP)	11773011	564861
$\varphi = 0.700(4.00)$	RRLS-EE	13631455	838495
	RRLS-AC	13832108	897800
	RRLS-EE(PTSP)	14082598	910779
$\varphi = 0.700(8.00)$	RRLS-EE	17876213	1820430
	RRLS-AC	18106642	1760025
	RRLS-EE(PTSP)	18305074	1921569
$\varphi = 0.800(1.00)$	RRLS-EE	10949173	400448
	RRLS-AC	11032530	377061
	RRLS-EE(PTSP)	10952337	405082
$\varphi = 0.800(2.00)$	RRLS-EE	11830721	469773
	RRLS-AC	11965990	472074
	RRLS-EE(PTSP)	12137584	586401
$\varphi = 0.800(4.00)$	RRLS-EE	14081112	866367
	RRLS-AC	14238113	812192
	RRLS-EE(PTSP)	14503467	813015
$\varphi = 0.800(8.00)$	RRLS-EE	18281116	1831748
	RRLS-AC	18386137	1858755
	RRLS-EE(PTSP)	18691088	1806912

Table 18: Comparison of the average cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 1000. The table gives, for each probability level, the mean and the standard deviation (s.d.) of the final solution cost. Part-III

	Algorithm	Solution Cost	
		mean	s.d.
$\varphi = 0.900(1.00)$	RRLS-EE	11379635	414984
	RRLS-AC	11483161	410687
	RRLS-EE(PTSP)	11379833	414791
$\varphi = 0.900(2.00)$	RRLS-EE	12273659	516849
	RRLS-AC	12444945	510696
	RRLS-EE(PTSP)	12565881	624478
$\varphi = 0.900(4.00)$	RRLS-EE	14484184	851292
	RRLS-AC	14693665	874089
	RRLS-EE(PTSP)	14957921	924361
$\varphi = 0.900(8.00)$	RRLS-EE	18650696	1867834
	RRLS-AC	18922320	1725412
	RRLS-EE(PTSP)	19075305	1760976
$\varphi = 1.000(1.00)$	RRLS-EE	11763373	419086
	RRLS-AC	11856534	433384
	RRLS-EE(PTSP)	11763373	419086
$\varphi = 1.000(2.00)$	RRLS-EE	12650946	504475
	RRLS-AC	12791192	523360
	RRLS-EE(PTSP)	13123054	553179
$\varphi = 1.000(4.00)$	RRLS-EE	14792798	879758
	RRLS-AC	15079298	879053
	RRLS-EE(PTSP)	15472949	801691
$\varphi = 1.000(8.00)$	RRLS-EE	18935303	1872809
	RRLS-AC	19207965	1830300
	RRLS-EE(PTSP)	19532656	2025111

Table 19: Comparison of the expected cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 100. The normalization is done on instance-by-instance basis. See Footnote 1 on this page for an explanation of the contents and the typographic conventions adopted in the table.

		RRLS-EE vs. RRLS-AC		RRLS-EE vs. RRLS-EE(PTSP)		RRLS-AC vs. RRLS-EE(PTSP)
p	d	CI	d	CI	d	CI
0.100(1.00)	<i>+0.04</i>	[+0.00, +0.08]	-0.17	[-0.35, +0.01]	-0.21	[-0.38, -0.04]
0.100(2.00)	+0.06	[-0.01, +0.12]	-0.38	[-0.60, -0.15]	-0.43	[-0.61, -0.25]
0.100(4.00)	+0.03	[-0.14, +0.19]	-0.23	[-0.37, -0.09]	-0.26	[-0.43, -0.09]
0.100(8.00)	+0.00	[-0.13, +0.14]	-0.24	[-0.40, -0.07]	-0.24	[-0.42, -0.06]
0.200(1.00)	+0.02	[-0.01, +0.06]	-0.42	[-0.87, +0.04]	-0.44	[-0.88, +0.00]
0.200(2.00)	+0.04	[-0.07, +0.14]	-1.12	[-1.84, -0.40]	-1.15	[-1.91, -0.40]
0.200(4.00)	-0.01	[-0.05, +0.03]	-0.23	[-0.48, +0.03]	-0.21	[-0.46, +0.03]
0.200(8.00)	+0.01	[-0.00, +0.03]	-0.05	[-0.13, +0.03]	-0.06	[-0.15, +0.02]
0.300(1.00)	-0.08	[-0.15, -0.00]	-0.34	[-0.72, +0.04]	-0.26	[-0.67, +0.15]
0.300(2.00)	-0.05	[-0.13, +0.02]	-2.45	[-3.21, -1.68]	-2.39	[-3.15, -1.64]
0.300(4.00)	-0.08	[-0.20, +0.04]	-0.48	[-0.86, -0.10]	-0.41	[-0.79, -0.02]
0.300(8.00)	-0.01	[-0.05, +0.02]	-0.06	[-0.18, +0.05]	-0.05	[-0.18, +0.08]
0.500(1.00)	-0.14	[-0.27, -0.01]	-0.10	[-0.20, -0.00]	+0.04	[-0.11, +0.19]
0.500(2.00)	-0.06	[-0.13, +0.01]	-3.56	[-5.17, -1.94]	-3.50	[-5.12, -1.87]
0.500(4.00)	-0.11	[-0.24, +0.02]	-1.80	[-2.53, -1.07]	-1.69	[-2.46, -0.92]
0.500(8.00)	-0.09	[-0.24, +0.06]	-0.29	[-0.56, -0.03]	-0.20	[-0.46, +0.05]
0.800(1.00)	-0.17	[-0.33, -0.00]	-0.10	[-0.30, +0.09]	+0.07	[-0.23, +0.36]
0.800(2.00)	-0.32	[-0.58, -0.05]	-4.69	[-6.45, -2.93]	-4.39	[-6.11, -2.67]
0.800(4.00)	-0.26	[-0.55, +0.03]	-4.04	[-6.00, -2.08]	-3.79	[-5.84, -1.74]
0.800(8.00)	-0.07	[-0.16, +0.01]	-0.87	[-1.31, -0.43]	-0.80	[-1.25, -0.34]
1.000(1.00)	-0.16	[-0.35, +0.03]	-0.12	[-0.32, +0.07]	+0.04	[-0.10, +0.18]
1.000(2.00)	-0.59	[-1.07, -0.10]	-4.93	[-6.71, -3.15]	-4.36	[-6.33, -2.40]
1.000(4.00)	-1.17	[-1.82, -0.53]	-4.65	[-6.43, -2.86]	-3.51	[-5.23, -1.80]
1.000(8.00)	-0.17	[-0.33, -0.02]	-3.30	[-4.95, -1.66]	-3.14	[-4.81, -1.46]

¹ For a given comparison A vs. B, the table reports the observed relative difference (d) between the two algorithms A and B and the 95% confidence interval (CI) obtained through the t-test. If the value is positive, algorithm A obtained an average cost that is larger than the one obtained by algorithm B. In this case, the value is typeset in italics if it is significantly different from zero according to the t-test at a confidence level of 95%. If the value is negative, algorithm A obtained an average cost that is smaller than the one obtained by algorithm B. In this case, the value is typeset in boldface if it is significantly different from zero according to the t-test, at a confidence level of 95%.

Table 20: Comparison of the expected cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 300. The normalization is done on instance-by-instance basis.

		RRLS-EE vs. RRLS-AC	RRLS-EE vs. RRLS-EE(PTSP)		RRLS-AC vs. RRLS-EE(PTSP)	
p	d	CI	d	CI	d	CI
0.100(1.00)	-0.02	[-0.08, +0.03]	-0.51	[-0.73, -0.28]	-0.48	[-0.75, -0.22]
0.100(2.00)	-0.68	[-1.64, +0.29]	-2.65	[-4.72, -0.58]	-1.99	[-3.35, -0.63]
0.100(4.00)	-0.29	[-0.56, -0.01]	-1.21	[-1.79, -0.63]	-0.92	[-1.35, -0.50]
0.100(8.00)	-0.04	[-0.22, +0.13]	-0.60	[-1.12, -0.07]	-0.55	[-1.01, -0.09]
0.200(1.00)	-0.18	[-0.37, +0.01]	-0.60	[-1.24, +0.03]	-0.42	[-1.14, +0.29]
0.200(2.00)	-0.28	[-0.52, -0.03]	-3.62	[-6.11, -1.14]	-3.36	[-5.86, -0.85]
0.200(4.00)	-0.55	[-1.24, +0.15]	-2.08	[-3.12, -1.05]	-1.55	[-2.56, -0.53]
0.200(8.00)	-0.24	[-0.57, +0.09]	-0.60	[-1.05, -0.15]	-0.36	[-0.69, -0.03]
0.300(1.00)	-0.50	[-0.78, -0.21]	-0.46	[-0.91, -0.01]	+0.04	[-0.55, +0.63]
0.300(2.00)	-0.67	[-1.37, +0.04]	-2.58	[-4.12, -1.03]	-1.93	[-3.60, -0.25]
0.300(4.00)	-0.43	[-0.88, +0.01]	-2.65	[-4.38, -0.92]	-2.22	[-4.00, -0.45]
0.300(8.00)	-0.13	[-0.24, -0.02]	-0.68	[-1.23, -0.12]	-0.55	[-1.14, +0.05]
0.500(1.00)	-0.31	[-0.66, +0.05]	-0.22	[-0.52, +0.08]	+0.09	[-0.43, +0.61]
0.500(2.00)	-1.62	[-3.24, -0.01]	-6.66	[-9.84, -3.47]	-5.11	[-8.69, -1.54]
0.500(4.00)	-0.81	[-1.41, -0.22]	-4.18	[-6.20, -2.16]	-3.40	[-5.35, -1.44]
0.500(8.00)	-0.31	[-0.61, -0.02]	-0.85	[-1.23, -0.47]	-0.54	[-0.90, -0.18]
0.800(1.00)	-0.02	[-0.08, +0.03]	-0.13	[-0.26, +0.00]	-0.11	[-0.20, -0.01]
0.800(2.00)	-1.95	[-4.10, +0.19]	-9.03	[-13.77, -4.28]	-7.21	[-12.65, -1.77]
0.800(4.00)	-0.15	[-0.33, +0.04]	-5.10	[-7.39, -2.81]	-4.96	[-7.32, -2.60]
0.800(8.00)	-0.01	[-0.03, +0.01]	-1.74	[-2.84, -0.64]	-1.73	[-2.83, -0.63]
1.000(1.00)	-0.05	[-0.15, +0.06]	-0.24	[-0.66, +0.18]	-0.19	[-0.64, +0.25]
1.000(2.00)	-1.43	[-3.16, +0.30]	-8.07	[-11.02, -5.12]	-6.73	[-9.79, -3.67]
1.000(4.00)	-0.08	[-0.27, +0.10]	-4.21	[-5.91, -2.50]	-4.13	[-5.86, -2.40]
1.000(8.00)	-0.35	[-1.09, +0.40]	-2.74	[-3.89, -1.60]	-2.41	[-3.44, -1.37]

Table 21: Comparison of the expected cost obtained by RRLS-EE, RRLS-AC, and RRLS-EE(PTSP) on clustered instances of size 1000. The normalization is done on instance-by-instance basis.

		RRLS-EE vs. RRLS-AC		RRLS-EE vs. RRLS-EE(PTSP)		RRLS-AC vs. RRLS-EE(PTSP)	
p	d	CI	d	CI	d	CI	
0.100	(1.00)	-0.23	[-0.40, -0.06]	-0.45	[-0.94, +0.04]	-0.22	[-0.65, +0.21]
0.100	(2.00)	-0.33	[-0.52, -0.15]	-3.83	[-6.56, -1.10]	-3.51	[-6.24, -0.77]
0.100	(4.00)	-0.36	[-0.67, -0.06]	-1.68	[-2.79, -0.57]	-1.32	[-2.43, -0.21]
0.100	(8.00)	-0.26	[-0.43, -0.09]	-1.14	[-1.73, -0.55]	-0.88	[-1.46, -0.30]
0.200	(1.00)	-0.94	[-1.29, -0.58]	-0.24	[-0.49, +0.01]	+0.70	[+0.23, +1.17]
0.200	(2.00)	-0.90	[-1.26, -0.54]	-3.89	[-6.47, -1.32]	-3.02	[-5.50, -0.55]
0.200	(4.00)	-0.87	[-1.45, -0.30]	-2.17	[-3.30, -1.05]	-1.31	[-2.44, -0.18]
0.200	(8.00)	-0.58	[-0.81, -0.35]	-1.21	[-1.97, -0.46]	-0.64	[-1.47, +0.19]
0.300	(1.00)	-0.73	[-1.16, -0.31]	-0.24	[-0.47, -0.01]	+0.50	[+0.02, +0.97]
0.300	(2.00)	-1.05	[-2.18, +0.07]	-3.69	[-5.68, -1.69]	-2.66	[-4.62, -0.70]
0.300	(4.00)	-0.84	[-1.29, -0.39]	-2.40	[-3.46, -1.35]	-1.58	[-2.83, -0.32]
0.300	(8.00)	-0.32	[-0.48, -0.17]	-1.22	[-2.02, -0.41]	-0.90	[-1.73, -0.06]
0.500	(1.00)	-0.83	[-1.18, -0.48]	-0.10	[-0.26, +0.06]	+0.73	[+0.28, +1.19]
0.500	(2.00)	-1.23	[-1.97, -0.48]	-3.61	[-5.67, -1.55]	-2.41	[-4.24, -0.59]
0.500	(4.00)	-1.15	[-1.94, -0.36]	-3.56	[-4.65, -2.46]	-2.44	[-3.52, -1.35]
0.500	(8.00)	-0.85	[-1.20, -0.51]	-1.78	[-2.72, -0.84]	-0.94	[-1.95, +0.08]
0.800	(1.00)	-0.76	[-1.11, -0.40]	-0.03	[-0.08, +0.02]	+0.73	[+0.36, +1.10]
0.800	(2.00)	-1.13	[-1.75, -0.51]	-2.53	[-4.06, -0.99]	-1.41	[-2.99, +0.17]
0.800	(4.00)	-1.10	[-1.74, -0.47]	-2.91	[-4.33, -1.49]	-1.83	[-2.93, -0.73]
0.800	(8.00)	-0.57	[-1.05, -0.09]	-2.19	[-3.30, -1.09]	-1.63	[-2.75, -0.51]
1.000	(1.00)	-0.79	[-1.18, -0.39]	+0.00	[NaN, NaN]	+0.79	[+0.40, +1.19]
1.000	(2.00)	-1.10	[-1.97, -0.22]	-3.60	[-5.40, -1.80]	-2.53	[-4.46, -0.60]
1.000	(4.00)	-1.90	[-3.10, -0.70]	-4.40	[-5.78, -3.01]	-2.54	[-3.90, -1.19]
1.000	(8.00)	-1.42	[-2.04, -0.80]	-3.06	[-4.51, -1.61]	-1.66	[-3.36, +0.03]

3 Comparison between estimation-based meta-heuristics

Table 22: Comparison of the average cost obtained by ILS-EE, MAGX-EE, ACS-EE and RRLS-EE, on clustered instances of size 1000 for 1000 CPU seconds.

$p(f_c)$	ILS-EE vs. MAGX-EE		ILS-EE vs. ACS-EE		MAGX-EE vs. ACS-EE		MAGX-EE vs. RRLS-EE		ACS-EE vs. RRLS-EE						
	d	[95% CI]	d	[95% CI]	d	[95% CI]	d	[95% CI]	d	[95% CI]					
Class I	0.050(1.00)	-0.05	-0.13	-0.08	-0.20	-0.23	-0.16	-0.05	-0.08	-0.13	-0.19	-0.10	-0.09	-0.13	-0.05
	0.050(2.00)	-0.03	-0.23	-0.18	-0.11	-0.31	+0.09	-0.08	-0.08	-0.13	-0.30	+0.23	-0.14	-0.18	+0.25
	0.050(4.00)	-0.22	-0.30	-0.14	-0.13	-0.21	-0.05	-0.27	-0.27	+0.12	+0.09	+0.18	+0.03	-0.05	+0.10
	0.050(8.00)	-0.04	-0.08	-0.01	-0.01	-0.05	+0.04	-0.03	-0.01	+0.11	+0.03	+0.15	+0.09	+0.04	+0.15
	0.075(1.00)	-0.04	-0.08	-0.01	-0.09	-0.14	+0.05	-0.47	-0.08	-0.02	-0.05	-0.08	-0.39	-0.43	-0.47
	0.075(2.00)	-0.12	-0.24	+0.00	-0.12	-0.27	+0.03	-0.99	-0.15	+0.15	-0.00	-0.15	+0.15	-0.87	-1.05
	0.075(4.00)	-0.13	-0.22	-0.04	-0.11	-0.54	-0.33	-0.44	-1.18	-0.80	-0.02	-0.11	-0.21	-0.31	-0.43
	0.075(8.00)	-0.08	-0.15	-0.00	-0.03	-0.10	+0.03	-0.29	-0.37	-0.21	+0.04	-0.03	+0.12	-0.21	-0.31
	0.100(1.00)	-0.10	-0.14	-0.05	-0.15	-0.20	-0.10	-1.02	-1.07	-0.97	-0.05	-0.11	+0.01	-0.92	-0.93
	0.100(2.00)	-0.11	-0.25	+0.02	-0.07	-0.23	+0.08	-1.15	-1.24	-1.06	+0.04	-0.14	+0.22	-1.04	-1.18
	0.100(4.00)	-0.07	-0.16	+0.03	-0.06	-0.18	+0.06	-0.67	-0.76	-0.58	+0.00	-0.11	+0.12	-0.61	-0.70
	0.100(8.00)	-0.05	-0.11	-0.01	+0.11	+0.01	+0.21	-0.36	-0.48	-0.24	+0.16	+0.05	+0.27	-0.31	-0.41
	overall	-0.09	-0.11	-0.06	-0.07	-0.11	-0.04	-0.48	-0.51	-0.44	+0.01	-0.02	+0.05	-0.39	-0.43
Class II	0.150(1.00)	-0.10	-0.16	-0.05	+0.04	-0.04	+0.12	-1.62	-1.70	-1.54	+0.14	+0.22	-1.52	-1.60	-1.57
	0.150(2.00)	-0.22	-0.32	-0.11	-0.11	-0.28	+0.06	-2.50	-2.75	-2.25	+0.11	+0.25	-2.29	-2.54	-2.16
	0.150(4.00)	-0.04	-0.17	+0.10	+0.08	-0.05	+0.21	-1.54	-1.74	-1.34	+0.11	+0.00	+0.23	-1.51	-1.79
	0.150(8.00)	-0.10	-0.18	-0.02	+0.07	-0.03	-0.18	-1.16	-1.27	-1.05	+0.17	+0.07	+0.28	-1.06	-1.17
	0.175(1.00)	-0.02	-0.09	+0.06	+0.04	-0.01	+0.14	-1.99	-2.08	-1.91	+0.08	+0.03	+0.14	-1.98	-1.98
	0.175(2.00)	-0.18	-0.28	-0.08	+0.07	-0.10	+0.19	-2.62	-2.87	-2.36	+0.22	+0.07	+0.38	-2.44	-2.69
	0.175(4.00)	-0.09	-0.22	+0.04	+0.12	-0.02	+0.26	-2.02	-2.15	-1.90	+0.22	+0.07	+0.36	-1.93	-2.04
	0.175(8.00)	-0.06	-0.14	+0.03	+0.15	+0.05	+0.24	-1.22	-1.29	-1.14	+0.20	+0.10	+0.31	-1.16	-1.24
	0.200(1.00)	-0.08	-0.16	-0.01	+0.02	-0.06	+0.10	-2.30	-2.38	-2.21	+0.10	+0.02	+0.18	-2.22	-2.31
	0.200(2.00)	-0.23	-0.41	-0.04	+0.11	-0.06	+0.28	-2.90	-3.10	-2.69	+0.34	+0.20	+0.48	-2.67	-2.83
	0.200(4.00)	-0.05	-0.19	+0.10	+0.19	+0.04	+0.35	-2.50	-2.67	-2.34	+0.24	+0.07	+0.41	-2.46	-2.62
	0.200(8.00)	-0.13	-0.23	-0.03	+0.18	+0.10	+0.27	-1.44	-1.53	-1.35	+0.31	+0.22	+0.41	-1.31	-1.39
	overall	-0.11	-0.14	-0.08	+0.08	+0.05	+0.12	-1.98	-2.04	-1.93	+0.19	+0.15	+0.22	-1.88	-1.93
Class III	0.300(1.00)	-0.08	-0.22	+0.06	+0.01	-0.13	+0.14	-3.38	-3.53	-3.24	+0.09	+0.01	+0.16	-3.30	-3.40
	0.300(2.00)	-0.12	-0.32	+0.09	+0.20	+0.01	+0.40	-3.79	-3.99	-3.58	+0.32	+0.16	+0.48	-3.67	-3.83
	0.300(4.00)	-0.28	-0.48	-0.08	+0.04	-0.16	+0.24	-3.43	-3.65	-3.21	+0.32	+0.12	+0.52	-3.16	-3.38
	0.300(8.00)	-0.27	-0.39	-0.15	-0.07	-0.17	+0.03	-2.10	-2.20	-2.00	+0.20	+0.07	+0.33	-1.84	-1.94
	0.500(1.00)	+0.13	-0.06	+0.31	+0.48	+0.29	+0.67	-3.67	-3.84	-3.50	+0.35	+0.27	+0.42	-3.80	-3.86
	0.500(2.00)	-0.11	-0.37	+0.15	+0.77	+0.52	+1.02	-4.54	-4.86	-4.23	+0.88	+0.69	+1.07	-4.44	-4.69
	0.500(4.00)	-0.09	-0.37	+0.19	+0.68	+0.39	+0.97	-3.98	-4.26	-3.69	+0.77	+0.60	+0.94	-3.90	-4.11
	0.500(8.00)	+0.00	-0.14	+0.14	+0.30	+0.14	+0.45	-2.98	-3.09	-2.86	+0.29	+0.15	+0.44	-2.98	-3.09
	0.800(1.00)	-0.32	-0.45	-0.18	+0.68	+0.54	+0.81	-3.60	-3.76	-3.45	+1.00	+0.88	+1.12	-3.30	-3.45
	0.800(2.00)	-0.93	-1.22	-0.64	+0.66	+0.43	+0.89	-5.10	-5.35	-4.84	+1.61	+1.35	+1.86	-4.21	-4.45
	0.800(4.00)	-0.64	-0.91	-0.37	+1.01	+0.80	+1.22	-3.79	-4.07	-3.60	+1.76	+1.40	+1.92	-3.89	-4.17
	0.800(8.00)	-0.43	-0.64	-0.21	+0.83	+0.63	+1.03	-3.79	-3.99	-3.59	+1.27	+1.10	+1.43	-3.38	-3.54
	1.000(1.00)	+0.29	+0.16	+0.43	+0.85	+0.71	+0.98	-3.63	-3.77	-3.49	+0.55	+0.46	+0.64	-3.91	-4.02
1.000(2.00)	-0.08	-0.34	+0.17	+1.10	+0.84	+1.36	-5.28	-5.55	-5.00	+1.18	+0.94	+1.43	-4.20	-4.42	
1.000(4.00)	-0.14	-0.42	+0.15	+1.17	+0.90	+1.45	-4.82	-5.16	-4.47	+1.31	+1.09	+1.53	-4.69	-5.02	
1.000(8.00)	-0.07	-0.35	+0.20	+0.89	+0.60	+1.18	-4.70	-4.97	-4.44	+0.97	+0.74	+1.19	-4.63	-4.84	
overall	-0.20	-0.25	-0.14	+0.60	+0.54	+0.65	-3.96	-4.02	-3.89	+0.79	+0.74	+0.84	-3.77	-3.83	
overall (3 classes)	-0.14	-0.16	-0.11	+0.23	+0.21	+0.26	-2.32	-2.38	-2.26	+0.37	+0.34	+0.40	-2.19	-2.24	

Table 24: Comparison of the average cost obtained by ILS-EE, MAGX-EE, ACS-EE and RRLS-EE, on clustered instances of size 100 for 100 CPU seconds.

$p(f_c)$	ILS-EE vs. MAGX-EE		ILS-EE vs. ACS-EE		ILS-EE vs. RRLS-EE		MAGX-EE vs. ACS-EE		MAGX-EE vs. RRLS-EE		ACS-EE vs. RRLS-EE		
	d	95% CI	d	95% CI	d	95% CI	d	95% CI	d	95% CI	d	95% CI	
Class I	0.050-1.00	-0.03	[-0.08, +0.02]	+0.01	[-0.06, +0.07]	+0.08	[-0.03, +0.14]	+0.03	[-0.02, +0.10]	+0.11	[-0.05, +0.18]	+0.08	[-0.03, +0.15]
	0.050-2.00	-0.05	[-0.12, +0.02]	+0.00	[-0.06, +0.07]	+0.12	[-0.04, +0.20]	+0.05	[-0.02, +0.12]	+0.12	[-0.08, +0.26]	+0.12	[-0.03, +0.21]
	0.050-4.00	-0.04	[-0.12, +0.04]	+0.03	[-0.07, +0.12]	+0.17	[-0.08, +0.26]	+0.07	[-0.01, +0.16]	+0.22	[-0.13, +0.30]	+0.14	[-0.05, +0.24]
	0.050-8.00	-0.05	[-0.13, +0.03]	+0.03	[-0.07, +0.12]	+0.17	[-0.08, +0.26]	+0.07	[-0.01, +0.16]	+0.22	[-0.13, +0.31]	+0.14	[-0.05, +0.24]
	0.075-1.00	-0.10	[-0.14, +0.05]	+0.01	[-0.04, +0.06]	-0.02	[-0.06, +0.03]	+0.11	[-0.06, +0.16]	+0.08	[-0.02, +0.15]	-0.03	[-0.08, +0.02]
	0.075-2.00	-0.10	[-0.16, +0.03]	+0.01	[-0.07, +0.09]	+0.03	[-0.02, +0.08]	+0.10	[-0.02, +0.18]	+0.13	[-0.06, +0.20]	+0.03	[-0.06, +0.11]
	0.075-4.00	-0.05	[-0.11, +0.00]	+0.01	[-0.12, +0.01]	+0.04	[-0.01, +0.10]	-0.00	[-0.06, +0.05]	+0.10	[-0.06, +0.14]	+0.10	[-0.03, +0.17]
	0.075-8.00	-0.05	[-0.10, +0.01]	+0.05	[-0.11, +0.02]	+0.05	[-0.00, +0.10]	-0.00	[-0.06, +0.05]	+0.10	[-0.06, +0.14]	+0.10	[-0.03, +0.17]
	0.100-1.00	-0.01	[-0.06, +0.05]	+0.04	[-0.01, +0.09]	-0.01	[-0.05, +0.04]	+0.05	[-0.01, +0.10]	-0.00	[-0.05, +0.05]	-0.05	[-0.09, +0.00]
	0.100-2.00	-0.06	[-0.12, +0.01]	+0.03	[-0.04, +0.09]	+0.04	[-0.02, +0.11]	+0.08	[-0.01, +0.15]	+0.10	[-0.01, +0.19]	+0.02	[-0.06, +0.10]
	0.100-4.00	-0.07	[-0.12, +0.02]	-0.06	[-0.11, +0.02]	+0.02	[-0.01, +0.05]	+0.01	[-0.04, +0.06]	+0.09	[-0.04, +0.14]	+0.08	[-0.04, +0.12]
	0.100-8.00	-0.07	[-0.13, +0.01]	-0.03	[-0.08, +0.03]	-0.07	[-0.13, +0.02]	+0.04	[-0.01, +0.09]	-0.01	[-0.07, +0.06]	-0.05	[-0.10, +0.00]
	overall	-0.06	[-0.07, +0.04]	-0.00	[-0.02, +0.02]	+0.05	[-0.04, +0.07]	+0.05	[-0.03, +0.07]	+0.11	[-0.09, +0.13]	+0.06	[-0.04, +0.08]
	Class II	0.150-1.00	+0.01	[-0.04, +0.06]	-0.00	[-0.06, +0.05]	-0.16	[-0.20, +0.11]	-0.02	[-0.07, +0.03]	-0.17	[-0.21, +0.13]	-0.15
0.150-2.00		-0.10	[-0.17, +0.03]	-0.12	[-0.21, +0.03]	-0.35	[-0.42, +0.28]	-0.02	[-0.10, +0.07]	-0.25	[-0.32, +0.17]	-0.23	[-0.31, +0.14]
0.150-4.00		-0.05	[-0.11, +0.00]	-0.02	[-0.09, +0.04]	-0.12	[-0.18, +0.06]	+0.03	[-0.02, +0.08]	-0.07	[-0.11, +0.03]	-0.10	[-0.16, +0.05]
0.150-8.00		-0.04	[-0.08, +0.00]	-0.01	[-0.06, +0.04]	-0.08	[-0.12, +0.04]	+0.03	[-0.01, +0.08]	-0.04	[-0.07, +0.01]	-0.07	[-0.11, +0.03]
0.175-1.00		-0.06	[-0.10, +0.02]	-0.08	[-0.14, +0.01]	-0.24	[-0.28, +0.20]	-0.02	[-0.08, +0.05]	-0.18	[-0.21, +0.14]	-0.16	[-0.22, +0.09]
0.175-2.00		-0.12	[-0.21, +0.04]	-0.15	[-0.28, +0.02]	-0.39	[-0.48, +0.29]	-0.03	[-0.16, +0.10]	-0.27	[-0.34, +0.19]	-0.24	[-0.35, +0.13]
0.175-4.00		-0.04	[-0.08, +0.00]	-0.04	[-0.14, +0.04]	-0.10	[-0.13, +0.07]	-0.04	[-0.10, +0.01]	-0.06	[-0.10, +0.02]	-0.01	[-0.06, +0.04]
0.175-8.00		-0.05	[-0.09, +0.01]	-0.06	[-0.11, +0.01]	-0.09	[-0.13, +0.05]	-0.01	[-0.06, +0.04]	-0.04	[-0.09, +0.01]	-0.03	[-0.09, +0.03]
0.200-1.00		-0.06	[-0.09, +0.02]	-0.16	[-0.25, +0.07]	-0.30	[-0.35, +0.25]	-0.11	[-0.20, +0.01]	-0.24	[-0.29, +0.20]	-0.14	[-0.24, +0.04]
0.200-2.00		-0.10	[-0.15, +0.04]	-0.10	[-0.17, +0.03]	-0.34	[-0.41, +0.28]	-0.20	[-0.33, +0.07]	-0.25	[-0.32, +0.17]	-0.04	[-0.18, +0.09]
0.200-4.00		-0.06	[-0.11, +0.01]	-0.10	[-0.17, +0.03]	-0.24	[-0.29, +0.19]	-0.04	[-0.11, +0.04]	-0.18	[-0.22, +0.13]	-0.14	[-0.21, +0.07]
0.200-8.00		-0.06	[-0.10, +0.02]	-0.08	[-0.13, +0.03]	-0.16	[-0.21, +0.11]	-0.02	[-0.07, +0.03]	-0.10	[-0.14, +0.06]	-0.08	[-0.14, +0.03]
overall		-0.06	[-0.08, +0.05]	-0.10	[-0.12, +0.07]	-0.21	[-0.23, +0.20]	-0.04	[-0.06, +0.01]	-0.15	[-0.17, +0.14]	-0.12	[-0.14, +0.09]
Class III		0.300-1.00	-0.03	[-0.07, +0.00]	+0.05	[-0.01, +0.08]	-0.59	[-0.66, +0.52]	+0.08	[-0.04, +0.12]	-0.56	[-0.63, +0.48]	-0.64
	0.300-2.00	-0.08	[-0.14, +0.02]	+0.04	[-0.02, +0.11]	-0.68	[-0.72, +0.64]	+0.13	[-0.05, +0.21]	-0.60	[-0.64, +0.55]	-0.72	[-0.79, +0.66]
	0.300-4.00	-0.01	[-0.06, +0.03]	+0.06	[-0.02, +0.15]	-0.31	[-0.36, +0.27]	+0.08	[-0.01, +0.16]	-0.30	[-0.35, +0.25]	-0.37	[-0.45, +0.29]
	0.300-8.00	-0.05	[-0.09, +0.02]	+0.03	[-0.02, +0.07]	-0.31	[-0.36, +0.26]	+0.06	[-0.03, +0.13]	-0.26	[-0.30, +0.21]	-0.34	[-0.40, +0.27]
	0.500-1.00	-0.06	[-0.09, +0.03]	+0.00	[-0.03, +0.03]	-0.57	[-0.60, +0.55]	+0.06	[-0.02, +0.10]	-0.51	[-0.55, +0.48]	-0.57	[-0.61, +0.54]
	0.500-2.00	-0.10	[-0.17, +0.03]	-0.05	[-0.12, +0.03]	-1.04	[-1.11, +0.98]	+0.05	[-0.04, +0.14]	-0.95	[-1.05, +0.85]	-1.00	[-1.10, +0.89]
	0.500-4.00	-0.12	[-0.19, +0.06]	-0.07	[-0.16, +0.02]	-0.82	[-0.89, +0.76]	+0.05	[-0.04, +0.15]	-0.70	[-0.77, +0.64]	-0.75	[-0.84, +0.67]
	0.500-8.00	-0.04	[-0.09, +0.00]	-0.00	[-0.04, +0.04]	-0.58	[-0.65, +0.50]	+0.04	[-0.01, +0.09]	-0.53	[-0.60, +0.47]	-0.57	[-0.65, +0.50]
	0.800-1.00	-0.07	[-0.11, +0.03]	-0.01	[-0.04, +0.02]	-1.33	[-1.43, +1.23]	+0.06	[-0.02, +0.10]	-1.26	[-1.36, +1.16]	-1.32	[-1.42, +1.22]
	0.800-2.00	-0.46	[-0.62, +0.31]	-0.18	[-0.30, +0.07]	-2.02	[-2.14, +1.89]	+0.28	[-0.08, +0.48]	-1.56	[-1.74, +1.38]	-1.84	[-2.01, +1.67]
	0.800-4.00	-0.34	[-0.48, +0.20]	-0.14	[-0.24, +0.04]	-1.79	[-1.91, +1.68]	+0.20	[-0.06, +0.35]	-1.46	[-1.58, +1.33]	-1.66	[-1.78, +1.53]
	0.800-8.00	-0.03	[-0.08, +0.01]	-0.04	[-0.08, +0.01]	-1.05	[-1.13, +0.97]	-0.00	[-0.06, +0.05]	-1.01	[-1.10, +0.92]	-1.01	[-1.10, +0.92]
	1.000-1.00	-0.02	[-0.08, +0.03]	+0.03	[-0.01, +0.07]	-1.40	[-1.53, +1.27]	+0.05	[-0.00, +0.10]	-1.38	[-1.51, +1.24]	-1.43	[-1.56, +1.29]
	1.000-2.00	-0.22	[-0.37, +0.07]	-0.13	[-0.24, +0.02]	-2.28	[-2.49, +2.08]	+0.09	[-0.08, +0.26]	-2.07	[-2.28, +1.86]	-2.16	[-2.35, +1.96]
1.000-4.00	-0.35	[-0.55, +0.14]	-0.13	[-0.34, +0.08]	-3.02	[-3.16, +2.88]	+0.22	[-0.02, +0.45]	-2.68	[-2.88, +2.48]	-2.89	[-3.09, +2.70]	
1.000-8.00	-0.12	[-0.23, +0.01]	+0.04	[-0.10, +0.17]	-2.13	[-2.23, +2.03]	+0.15	[-0.01, +0.29]	-2.01	[-2.13, +1.90]	-2.16	[-2.29, +2.04]	
overall	-0.13	[-0.16, +0.11]	-0.03	[-0.05, +0.01]	-1.25	[-1.29, +1.20]	+0.10	[-0.07, +0.13]	-1.12	[-1.16, +1.07]	-1.21	[-1.26, +1.17]	
overall	-0.09	[-0.10, +0.08]	-0.04	[-0.06, +0.03]	-0.55	[-0.57, +0.52]	+0.04	[-0.03, +0.06]	-0.46	[-0.49, +0.43]	-0.50	[-0.53, +0.48]	