

# Revenue from the Saints, the Showoffs, and the Predators: Comparisons of Auctions with Price-Preference Values Supplemental Information

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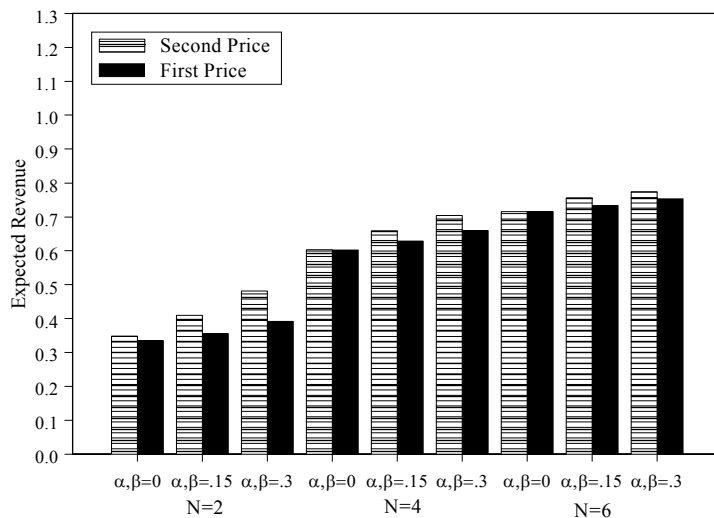
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The tables below contain all of the numerical results from the main paper that are either summarized in the figures or described in the text. We have also included results of significance tests between the revenue and efficiencies achieved for every set of parameters run. The tests on the revenue numbers are general t-tests and Wilcoxon rank sum tests with the numbers included representing the p-values of the test. For the efficiency comparisons, the tests are paired t-tests and signed rank sum tests, a paired version of the Wilcoxon test. The numbers also are the p-values of the test.

## 1 Standard Charity

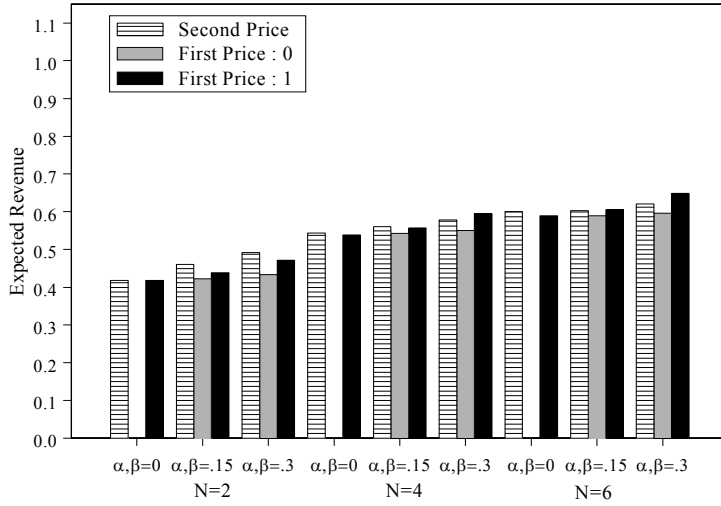
**Figure 1:** Revenue comparison assuming uniformly distributed values between second price and first price auctions and between the standard and then baseline symmetric charity cases.



**Support for Figure 1:**

Case	N	Revenue				Efficiency			
		FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\alpha_i = 0$	2	.3350 (.1201)	.3477 (.2395)	0.090	0.1344	1 (0)	1 (0)	1	NA
$\beta_i = 0$	4	.6022 (.1177)	.6028 (.2012)	0.231	0.932	1 (0)	1 (0)	1	NA
	6	.7153 (.1044)	.7155 (.1590)	0.088	0.971	1 (0)	1 (0)	1	NA
$\alpha_i = .15$	2	.3557 (.1280)	.4097 (.1969)	0	0	1 (0)	1 (0)	1	NA
$\beta_i = .15$	4	.6284 (.1254)	.6588 (.1770)	0	0	1 (0)	1 (0)	1	NA
	6	.7338 (.1058)	.7562 (.1355)	0	0	1 (0)	1 (0)	1	NA
$\alpha_i = .3$	2	.3922 (.1380)	.4815 (.1808)	0	0	1 (0)	1 (0)	1	NA
$\beta_i = .3$	4	.6598 (.1209)	.7040 (.1511)	0	0	1 (0)	1 (0)	1	NA
	6	.7527 (.1103)	.7733 (.1263)	0	0	1 (0)	1 (0)	1	NA

**Figure 2:** Revenue comparison for the standard and baseline symmetric charity cases assuming normally distributed values.



Normal distribution,  $\mu = .5, \sigma = .15$

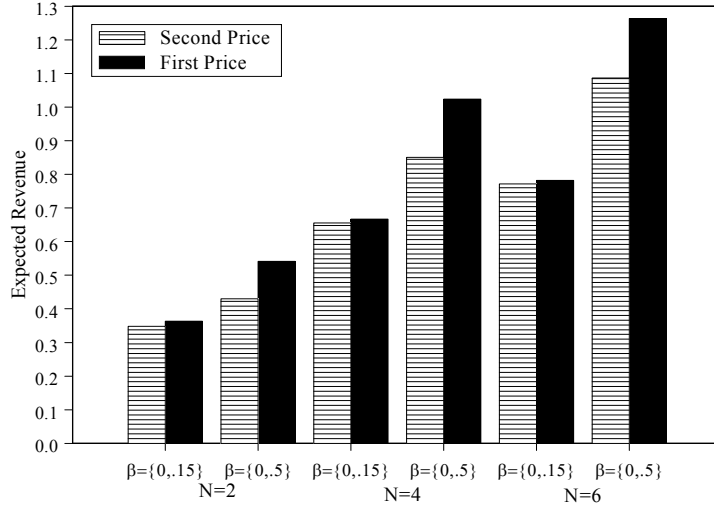
**Support for figure 2:**

$\bar{\alpha} = \bar{\beta} = \alpha_i = \beta_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\alpha_i = 0$	2	.4177 (.0539)	.4183 (.1211)	0.5657	0.8864	1 (0)	1 (0)	1	NA
	4	.5388 (.0460)	.5434 (.0898)	.5563	.1492	1 (0)	1 (0)	1	NA
		6	.5891 (.0418)	.6001 (.0791)	.0035	.0001	1 (.0055)	1 (0)	1
$\alpha_i = .15$	2	.4381 (.0596)	.4601 (.0828)	.0042	0	1 (0)	1 (0)	1	NA
	4	.5573 (.0518)	.5600 (.0850)	.4651	.4031	1 (0)	1 (0)	1	NA
		6	.6055 (.0473)	.6030 (.0795)	.0451	.4007	1 (0)	1 (0)	1
$\alpha_i = .3$	2	.4713 (.0849)	.4918 (.0729)	.1249	0	1 (0)	1 (0)	1	NA
	4	.5949 (.0677)	.5780 (.0746)	0	0	1 (0)	1 (0)	1	NA
		6	.6483 (.0594)	.6205 (.0779)	0	0	1 (0)	1 (0)	1

$\bar{\alpha} = \bar{\beta} = 0$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\alpha_i = .15$	2	.4225 (.0546)	.4621 (.0982)	0	0	1 (.0095)	1 (0)	.1250	.0636
$\beta_i = .15$	4	.5430 (.0450)	.5760 (.0863)	0	0	1 (0)	1 (0)	1	NA
	6	.5898 (.0417)	.6191 (.0752)	0	0	1 (0)	1 (0)	1	NA
$\alpha_i = .3$	2	.4330 (.0510)	.4857 (.0880)	0	0	1 (.0095)	1 (0)	.0078	.0207
$\beta_i = .3$	4	.5502 (.0443)	.5975 (.0796)	0	0	1 (0)	1 (0)	1	NA
	6	.5963 (.0418)	.6342 (.0772)	0	0	1 (0)	1 (0)	1	NA

## 2 See and Be Seen

**Figure 3:** Revenue comparisons for SBS model assuming uniformly distributed values.

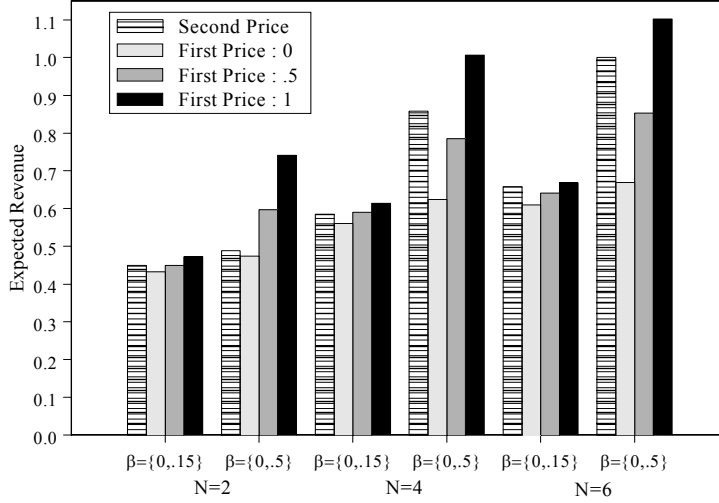


Support for figure 3:

$\beta = 0$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.3622 (.1334)	.3525 (.2462)	0	.2745	.9953 (.0206)	.9953 (.0206)	1	1
$\alpha_i = 0$	4	.6612 (.1432)	.6441 (.2137)	.3064	.0357	.9889 (.0317)	.9889 (.0317)	1	1
	6	.7917 (.1275)	.7734 (.1763)	.1351	.0092	.9866 (.0330)	.9866 (.0330)	1	1
$\beta_i = .5$	2	.5422 (.2468)	.4213 (.2719)	0	0	.9411 (.1264)	.9411 (.1264)	1	1
$\alpha_i = .0$	4	1.0259 (.3054)	.8614 (.3322)	0	0	.9170 (.1376)	.9170 (.1376)	1	1
	6	1.2607 (.2886)	1.0841 (.3450)	0	0	.9131 (.1307)	.9131 (.1307)	1	1
$\beta = .5\beta_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.3667 (.1334)	.3609 (.2467)	0.0012	.5131	.9937 (.0243)	.9937 (.0243)	1	1
$\alpha_i = 0$	4	.6574 (.1398)	.6434 (.2096)	.4418	.0789	.9901 (.0297)	.9901 (.0297)	1	1
	6	.7992 (.1224)	.7835 (.1733)	.4303	.0198	.9851 (.0353)	.9851 (.0353)	1	1
$\beta_i = .5$	2	.5577 (.2390)	.4291 (.2815)	0	0	.9403 (.1256)	.9403 (.1256)	1	1
$\alpha_i = .0$	4	1.0262 (.3112)	.8598 (.3463)	0	0	.9150 (.1400)	.9150 (.1400)	1	1
	6	1.2606 (.2996)	1.0897 (.3528)	0	0	.9182 (.1290)	.9182 (.1290)	1	1

$\beta = \beta_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.3630 (.1351)	.3484 (.2533)	0	.1073	.9945 (.0226)	.9945 (.0226)	1	1
$\alpha_i = 0$	4	.6672 (.1408)	.6557 (.2233)	.7492	.1714	.9900 (.0292)	.9900 (.0292)	1	1
	6	.7825 (.1368)	.7712 (.1767)	.4595	.1080	.9864 (.0346)	.9864 (.0346)	1	1
$\beta_i = .5$	2	.5417 (.2434)	.4297 (.2821)	0	0	.9318 (.1366)	.9318 (.1366)	1	1
$\alpha_i = .0$	4	1.0240 (.3125)	.8504 (.3487)	0	0	.9201 (.1351)	.9201 (.1351)	1	1
	6	1.2638 (.2987)	1.0871 (.3593)	0	0	.9150 (.1339)	.9150 (.1339)	1	1

**Figure 4:** Revenue comparison for the SBS model for normally distributed values.



Support for figure 4:

$\beta = 0$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.4328 (.0403)	.4469 (.1323)	0.0052	0.0018	.9862 (.0372)	.9872 (.0340)	.0442	.6393
$\alpha_i = 0$	4	.5624 (.0403)	.5908 (.1036)	0	0	.9835 (.0381)	.9850 (.0352)	.0020	.3738
	6	.6116 (.0389)	.6555 (.0861)	0	0	.9862 (.0327)	.9833 (.0368)	.0030	.0612
$\beta_i = .5$	2	.4740 (.0322)	.4890 (.1439)	.0297	.0014	.9179 (.1310)	.9050 (.1442)	.0002	.0372
$\alpha_i = 0$	4	.6232 (.0385)	.8542 (.2049)	0	0	.8991 (.1246)	.9022 (.1362)	.3954	.5934
	6	.6658 (.0371)	1.0066 (.1897)	0	0	.9176 (.1009)	.9100 (.1212)	.0589	.1274

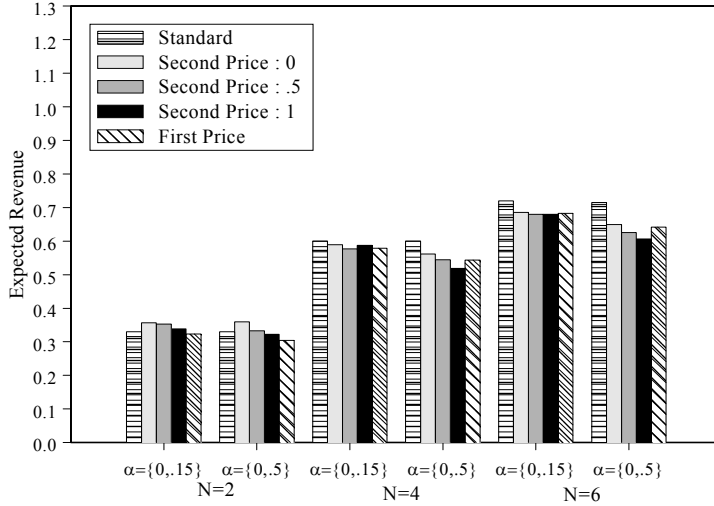
  

$\beta = .5\beta_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.4511 (.0625)	.4487 (.1321)	.3091	.5984	.9896 (.0302)	.9896 (.0301)	.8125	.9600
$\alpha_i = 0$	4	.5867 (.0505)	.5968 (.0985)	.1570	.0042	.9841 (.0361)	.9831 (.0377)	.0156	.5414
	6	.6398 (.0477)	.6536 (.0892)	.0014	0	.9863 (.0323)	.9825 (.0377)	0	.0151
$\beta_i = .5$	2	.5962 (.0711)	.5013 (.1484)	0	0	.8963 (.1439)	.8859 (.1529)	.0016	.1179
$\alpha_i = 0$	4	.7850 (.0698)	.8580 (.1965)	0	0	.9048 (.1248)	.9060 (.1305)	.5159	.8275
	6	.8547 (.0595)	.9947 (.1937)	0	0	.9107 (.1143)	.9104 (.1218)	.2160	.9607

$\beta = \beta_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = .15$	2	.4671 (.0765)	.4511 (.1363)	.0016	.0012	.9884 (.0322)	.9887 (.0316)	.5000	.8326
$\alpha_i = 0$	4	.6104 (.0631)	.5854 (.0996)	0	0	.9859 (.0347)	.9865 (.0338)	.0625	.6831
	6	.6698 (.0564)	.6580 (.0898)	0	.0005	.9837 (.0363)	.9817 (.0392)	.0001	.2362
$\beta_i = .5$	2	.7413 (.1671)	.4879 (.1492)	0	0	.8922 (.1494)	.8953 (.1462)	.0098	.6385
$\alpha_i = 0$	4	1.0062 (.1400)	.8581 (.2087)	0	0	.9116 (.1284)	.9152 (.1237)	.0078	.5202
	6	1.1028 (.1265)	1.0000 (.1857)	0	0	.9171 (.1132)	.9150 (.1161)	.0391	.6900

### 3 Raising Rivals' Cost

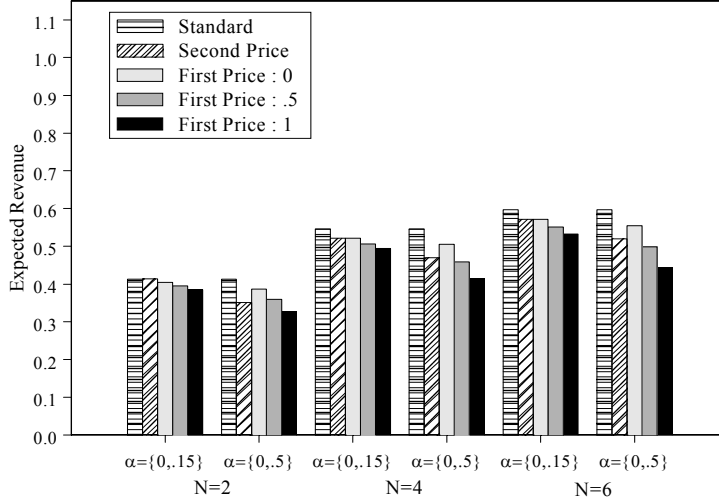
Figure 5: Revenue comparisons for RRC model assuming uniformly distributed values.



$\bar{\alpha} = 0$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.3244 (.1144)	.3612 (.2102)	.0573	0	.9983 (.0089)	.9894 (.0718)	0	.0001
$\alpha_i = .15$	4	.5733 (.1183)	.5854 (.1725)	.0296	.0674	.9956 (.0169)	.9950 (.0287)	.8291	.5686
	6	.6776 (.1031)	.6903 (.1407)	.0002	.0218	.9903 (.0246)	.9924 (.0213)	0	.0507
$\beta_i = 0$	2	.2972 (.1104)	.3591 (.1782)	0	0	.9901 (.0347)	.9707 (.1159)	0	0
$\alpha_i = .5$	4	.5340 (.1347)	.5617 (.1375)	.0002	0	.9703 (.0659)	.9811 (.0559)	0	.0001
	6	.6496 (.1264)	.6508 (.1201)	.1611	.8355	.9578 (.0776)	.9757 (.0540)	0	0
$\bar{\alpha} = .5\alpha_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.3249 (.1126)	.3477 (.2149)	.9977	.0021	.9988 (.0070)	.9926 (.0573)	0	.0006
$\alpha_i = .15$	4	.5737 (.1190)	.5804 (.1707)	.1857	.3093	.9961 (.0157)	.9959 (.0179)	.5306	.8361
	6	.6801 (.1074)	.6779 (.1409)	.6541	.6150	.9922 (.0222)	.9928 (.0212)	.1726	.5275
$\beta_i = 0$	2	.3019 (.1144)	.3311 (.1674)	.0003	0	.9923 (.0306)	.9715 (.1214)	0	
$\alpha_i = .5$	4	.5405 (.1369)	.5443 (.1429)	.6642	.5399	.9687 (.0673)	.9728 (.0625)	.0207	.1616
	6	.6571 (.1255)	.6302 (.1330)	0	0	.9627 (.0733)	.9692 (.0646)	0	.0350

$\bar{\alpha} = \alpha_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.3231 (.1163)	.3385 (.2036)	.4216	.0399	.9991 (.0063)	.9934 (.0553)	0	.0013
$\alpha_i = .15$	4	.5788 (.1159)	.5879 (.1735)	.0676	.1658	.9960 (.0153)	.9939 (.0239)	.0002	.0191
	6	.6794 (.1047)	.6786 (.1408)	.3608	.8821	.9922 (.0221)	.9917 (.0236)	.0256	.6044
$\beta_i = 0$	2	.3037 (.1111)	.3190 (.1580)	.2320	.0123	.9881 (.0379)	.9763 (.0886)	0	.0001
$\alpha_i = .5$	4	.5434 (.1287)	.5189 (.1470)	0	.0001	.9714 (.0646)	.9665 (.0735)	.0001	.1106
	6	.6416 (.1313)	.6059 (.1427)	0	0	.9575 (.0786)	.9574 (.0798)	.2891	.9710

**Figure 6:** Revenue comparisons for RRC model assuming normally distributed values.



$\bar{\alpha} = 0$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.4023 (.0586)	.4055 (.1051)	.6901	.4062	.9947 (.0190)	.9949 (.0311)	.0821	.8285
$\alpha_i = .15$	4	.5223 (.0511)	.5230 (.0815)	.5037	.8213	.9911 (.0253)	.9947 (.0182)	0	.0002
	6	.5711 (.0484)	.5682 (.0744)	.0231	.3037	.9903 (.0249)	.9915 (.0228)	.0084	.2444
$\beta_i = 0$	2	.3875 (.0683)	.4004 (.0760)	.0016	.0001	.9624 (.0743)	.9793 (.0580)	0	0
$\alpha_i = .5$	4	.5072 (.0613)	.4963 (.0665)	0	.0002	.9348 (.0966)	.9656 (.0657)	0	0
	6	.5535 (.0586)	.5352 (.0683)	0	0	.9374 (.0901)	.9564 (.0716)	0	0
$\bar{\alpha} = .5\alpha_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.3947 (.0513)	.4094 (.0879)	0	0	.9948 (.0184)	.9855 (.0435)	0	0
$\alpha_i = .15$	4	.5061 (.0446)	.4976 (.0652)	0	.0006	.9910 (.0246)	.9745 (.0566)	0	0
	6	.5512 (.0409)	.5398 (.0700)	0	0	.9904 (.0244)	.9573 (.0720)	0	0
$\beta_i = 0$	2	.3601 (.0464)	.3674 (.0724)	.6830	.0071	.9665 (.0690)	.9642 (.0738)	.0425	.4713
$\alpha_i = .5$	4	.4595 (.0419)	.4711 (.0830)	.9613	.0001	.9488 (.0830)	.9491 (.0840)	.6051	.9355
	6	.4998 (.0361)	.5194 (.0832)	0	0	.9478 (.0807)	.9414 (.0881)	.0002	.0901

$\bar{\alpha} = \alpha_i$		Revenue				Efficiency			
Case	N	FP	SP	Wilcoxon	t	FP	SP	Wilcoxon	t
$\beta_i = 0$	2	.3853 (.0470)	.4095 (.0996)	0	0	.9936 (.0217)	.9931 (.0242)	.2744	.6480
$\alpha_i = .15$	4	.4910 (.0372)	.5161 (.0862)	0	0	.9900 (.0268)	.9920 (.0230)	.0004	.0657
	6	.5334 (.0356)	.5661 (.0763)	0	0	.9916 (.0226)	.9910 (.0240)	.0097	.5545
$\beta_i = 0$	2	.3282 (.0326)	.3512 (.0754)	0	0	.9671 (.0682)	.9586 (.0796)	0	.0101
$\alpha_i = .5$	4	.4150 (.0273)	.4672 (.0872)	0	0	.9425 (.0879)	.9476 (.0853)	.0034	.1815
	6	.4441 (.0248)	.5229 (.0853)	0	0	.9445 (.0817)	.9376 (.0922)	.0015	.0755