Statistical Significance Analysis
(* p<0.05, ** p<0.01, *** p<0.001)
Summary Statistics (% of Optimal Welfare)

Method	Nash Mean	Nash Std	Nash Min	Nash Max	Util Mean	Util Std
10-20 Model + EF1	96.62%	1.42%	91.80%	98.61%	95.57%	1.70%
30-60 Model + EF1	96.81%	1.18%	93.29%	98.46%	95.76%	1.62%
Multi-Objective + EF1	96.70%	1.20%	92.98%	98.15%	95.88%	1.60%
MaxUtil + EF1	93.89%	1.71%	89.28%	96.74%	93.56%	2.09%
Round-Robin	93.70%	1.44%	87.18%	95.95%	92.26%	1.31%
ECE	79.32%	12.75%	39.15%	90.43%	78.96%	9.14%

Statistical Significance - Nash Welfare

Comparison	Mean Diff (%)	95% CI	Cohen's d	t-test p	Wilcoxon p
10-20 Model vs MaxUtil+EF1	2.74	[2.64, 2.84]	3.52	8.88e-132 ***	1.20e-39 ***
10-20 Model vs Round-Robin	2.92	[2.72, 3.13]	1.82	2.99e-75 ***	2.01e-39 ***
10-20 Model vs ECE	17.30	[15.72, 18.89]	1.41	1.36e-56 ***	1.20e-39 ***
30-60 Model vs MaxUtil+EF1	2.92	[2.83, 3.01]	4.22	9.58e-149 ***	1.20e-39 ***
30-60 Model vs Round-Robin	3.11	[3.00, 3.21]	3.70	2.00e-136 ***	1.20e-39 ***
30-60 Model vs ECE	17.48	[15.92, 19.05]	1.44	3.79e-58 ***	1.20e-39 ***
Multi-Obj Model vs MaxUtil+EF1	2.81	[2.72, 2.91]	3.92	8.14e-142 ***	1.20e-39 ***
Multi-Obj Model vs Round-Robin	3.00	[2.83, 3.18]	2.25	3.91e-92 ***	1.20e-39 ***
Multi-Obj Model vs ECE	17.38	[15.81, 18.96]	1.42	1.99e-57 ***	1.20e-39 ***
10-20 Model vs 30-60 Model	-0.18	[-0.30, -0.06]	-0.20	0.0027 **	8.67e-05 ***
10-20 Model vs Multi-Obj Model	-0.08	[-0.14, -0.02]	-0.18	0.0077 **	0.0230 *
30-60 Model vs Multi-Obj Model	0.10	[0.02, 0.18]	0.17	0.0105 *	2.54e-07 ***

Statistical Significance - Utilitarian Welfare

Comparison	Mean Diff (%)	95% CI	Cohen's d	t-test p	Wilcoxon p
10-20 Model vs MaxUtil+EF1	2.01	[1.93, 2.08]	3.29	1.45e-125 ***	1.20e-39 ***
10-20 Model vs Round-Robin	3.31	[3.11, 3.51]	2.15	2.76e-88 ***	2.38e-39 ***
10-20 Model vs ECE	16.61	[15.43, 17.78]	1.82	3.36e-75 ***	1.20e-39 ***
30-60 Model vs MaxUtil+EF1	2.20	[2.09, 2.31]	2.62	3.45e-105 ***	1.20e-39 ***
30-60 Model vs Round-Robin	3.50	[3.39, 3.61]	4.09	9.33e-146 ***	1.20e-39 ***
30-60 Model vs ECE	16.80	[15.65, 17.95]	1.88	1.17e-77 ***	1.20e-39 ***
Multi-Obj Model vs MaxUtil+EF1	2.32	[2.24, 2.39]	4.16	2.34e-147 ***	1.20e-39 ***
Multi-Obj Model vs Round-Robin	3.62	[3.46, 3.78]	2.88	1.35e-113 ***	1.20e-39 ***
Multi-Obj Model vs ECE	16.92	[15.75, 18.08]	1.88	1.90e-77 ***	1.20e-39 ***
10-20 Model vs 30-60 Model	-0.19	[-0.31, -0.08]	-0.21	0.0015 **	9.45e-05 ***
10-20 Model vs Multi-Obj Model	-0.31	[-0.36, -0.26]	-0.85	2.77e-29 ***	7.89e-25 ***
30-60 Model vs Multi-Obj Model	-0.12	[-0.19, -0.04]	-0.19	0.0035 **	0.3933