

Power Analysis Report

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Introduction

This report presents the results of power analysis for A/B testing. Power analysis helps determine the sample size required to detect a specified effect with a given level of confidence. The analysis is performed for two metrics: Click-Through Rate (CTR) and Revenue Amount.

CTR Power Analysis

Standard Analysis

Parameter	Value
baseline_ctr	0.0200
minimum_detectable_effect	0.0020
effect_size	-0.0140
sample_size_per_variant	80639
total_sample_size	161278.0000
alpha	0.0500
power	0.8000
actual_power	0.8000
traffic_split	0.5000

CTR Power Curve

Revenue Power Analysis

Standard Analysis

Parameter	Value
baseline_mean	50.0000
baseline_std	25.0000
minimum_detectable_effect	5.0000
effect_size	0.2000
sample_size_per_variant	394
total_sample_size	788.0000
alpha	0.0500
power	0.8000

actual_power	0.8006
traffic_split	0.5000

Revenue Power Curve

Custom CTR Power Analysis

Parameter	Value
baseline_ctr	0.0500
minimum_detectable_effect	0.0050
effect_size	-0.0224
sample_size_per_variant	42273
total_sample_size	60390.0000
alpha	0.0100
power	0.9000
actual_power	0.9000
traffic_split	0.7000

Custom CTR Power Curve

Custom Revenue Power Analysis

Parameter	Value
baseline_mean	100.0000
baseline_std	50.0000
minimum_detectable_effect	10.0000
effect_size	0.2000
sample_size_per_variant	533
total_sample_size	761.4286
alpha	0.0100
power	0.9000
actual_power	0.9004

traffic_split	0.7000
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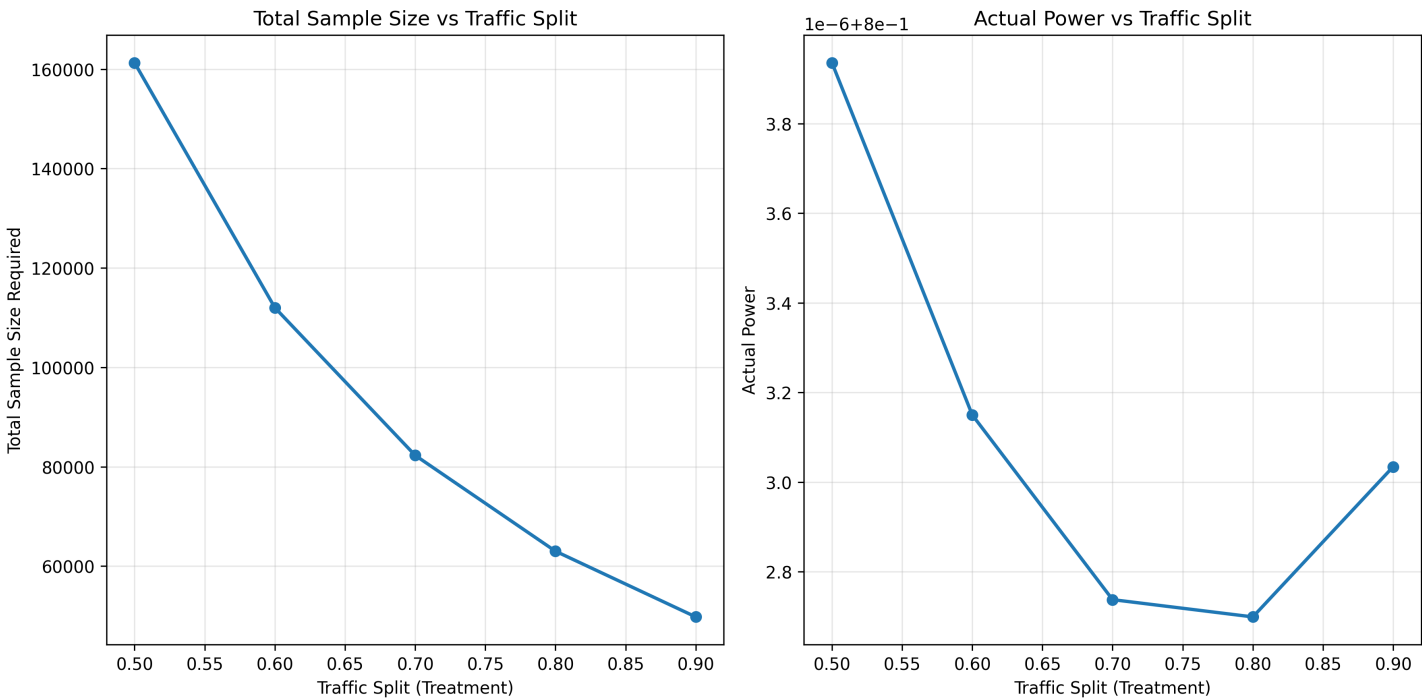
Custom Revenue Power Curve

Traffic Split Comparison

This section compares the impact of different traffic splits on the required sample size and actual power.

Traffic Split	Sample Size/Variant	Total Sample Size	Actual Power
0.50	80639.0	161278.0	0.8000
0.60	67199.0	111998.33333333333	0.8000
0.70	57599.0	82284.28571428571	0.8000
0.80	50399.0	62998.75	0.8000
0.90	44799.0	49776.66666666667	0.8000

Traffic Split Comparison Plots

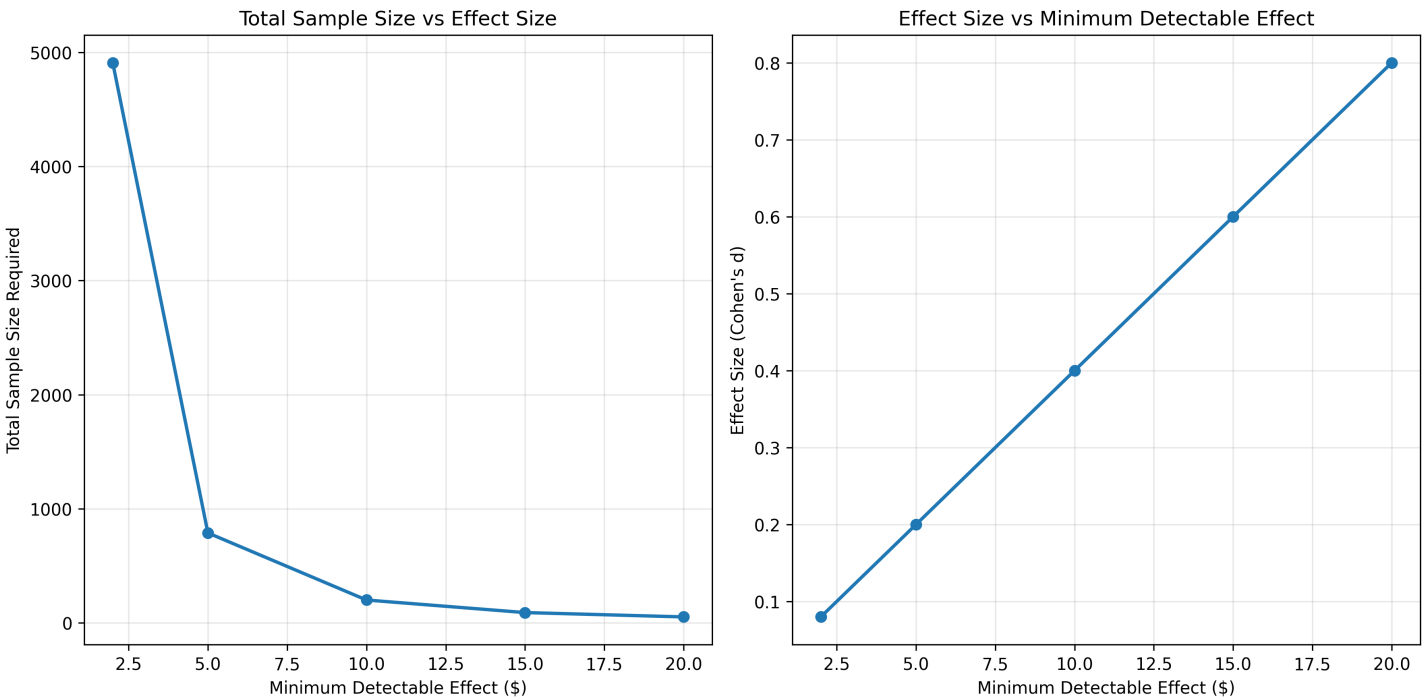


Effect Size Comparison

This section compares the impact of different effect sizes on the required sample size and statistical power.

MDE (\$)	Effect Size (d)	Sample Size/Variant	Total Sample Size
2.00	0.0800	2454.0	4908.0
5.00	0.2000	394.0	788.0
10.00	0.4000	100.0	200.0
15.00	0.6000	45.0	90.0
20.00	0.8000	26.0	52.0

Effect Size Comparison Plots



Conclusion

This power analysis provides insights into the sample sizes required for A/B testing with different metrics, effect sizes, and traffic splits. The results can be used to plan experiments and ensure they have sufficient statistical power to detect meaningful differences between variants.