

A/B Test: New Website Design Impact Analysis

Overview

This project evaluates the impact of a new website design on key performance metrics using A/B testing. The goal is to determine whether the redesign improves user engagement and revenue-related metrics compared to the existing design.

Dataset

The dataset contains user interaction data collected during the test period. The key columns include:

- group: Indicates whether the user was in the control or test group.
- country: The country of the user.
- impressions: The number of times the website was shown to users.
- clicks: The number of times users clicked on the website.
- revenue: The total revenue generated from users.

	group	country	impressions	clicks	revenue
0	1	France	20	5	0.296400
1	1	France	6	4	0.228307
2	0	Germany	12	3	0.206884
3	1	United Kingdom	25	4	0.150042
4	0	Australia	16	1	0.045251

group	impressions	clicks	revenue
0	390467	90336	4523.304348
1	390298	90177	4507.609240

Table of the test and control group

Hypothesis

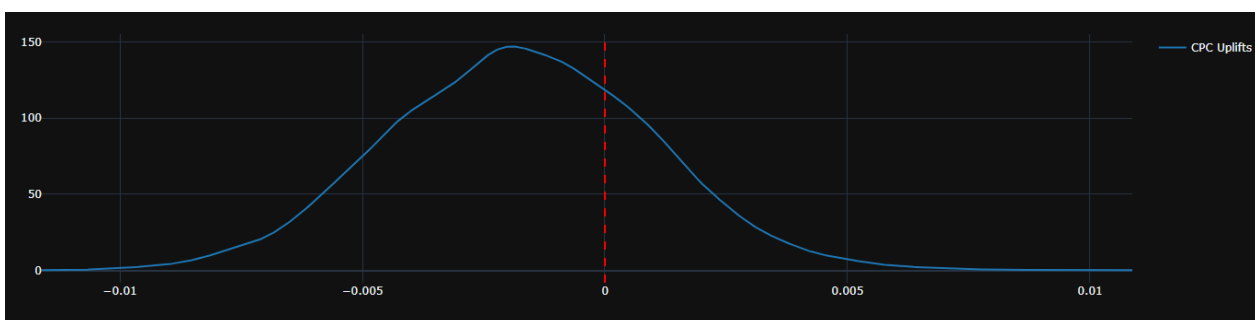
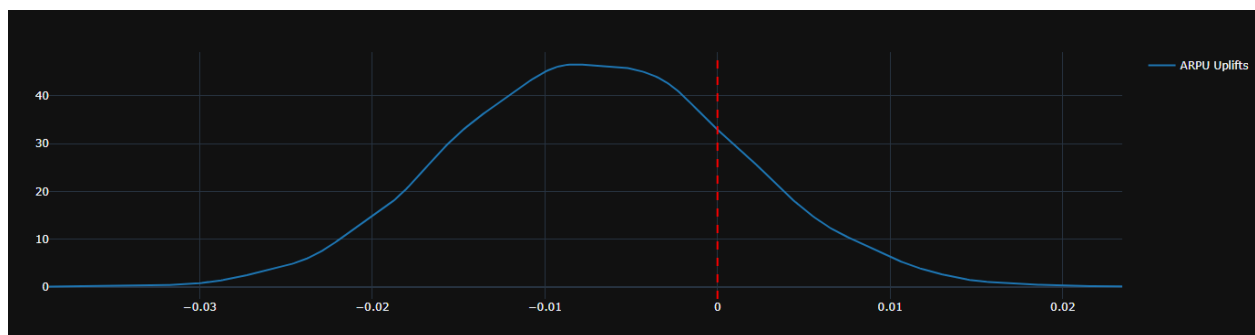
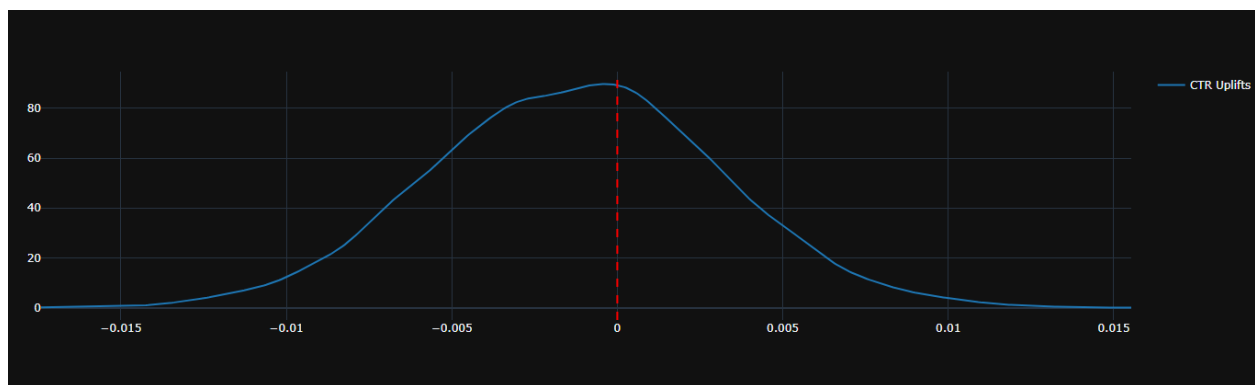
"The new website design improves key engagement and revenue metrics such as Click-Through Rate (CTR) and Average Revenue Per User (ARPU) without negatively impacting Cost Per Click (CPC)."

Test Methodology

- Users were randomly split into two groups:
 - Control Group: Experienced the original website design.
 - Test Group: Experienced the redesigned website.
- The experiment was conducted over a sufficiently long period to collect statistically meaningful data.
- Statistical tests were performed to determine whether the observed differences were significant.

Key Findings

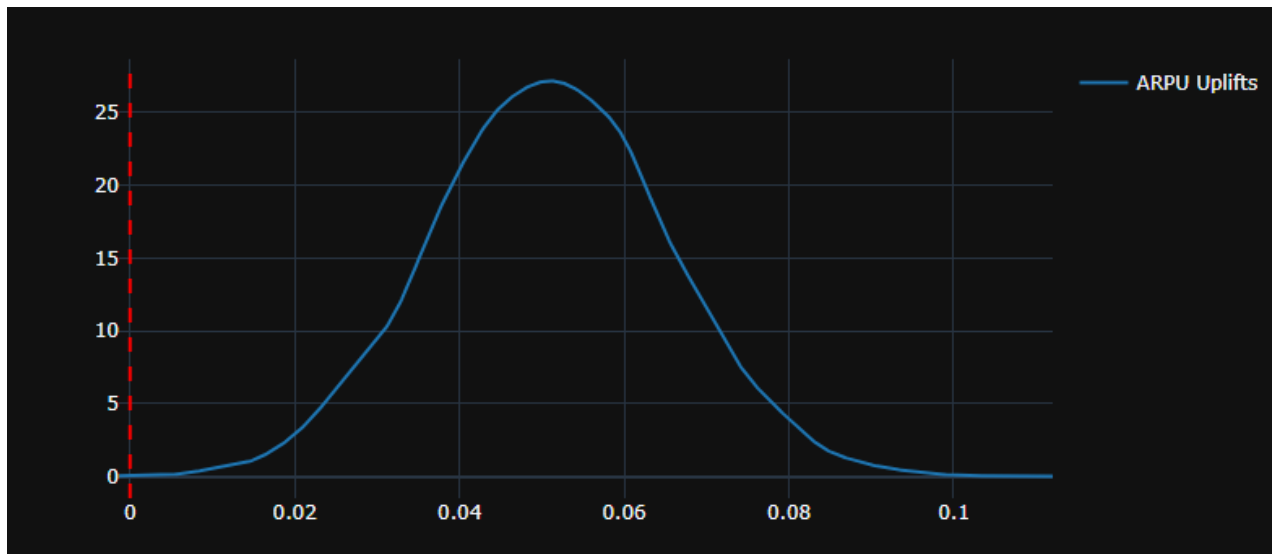
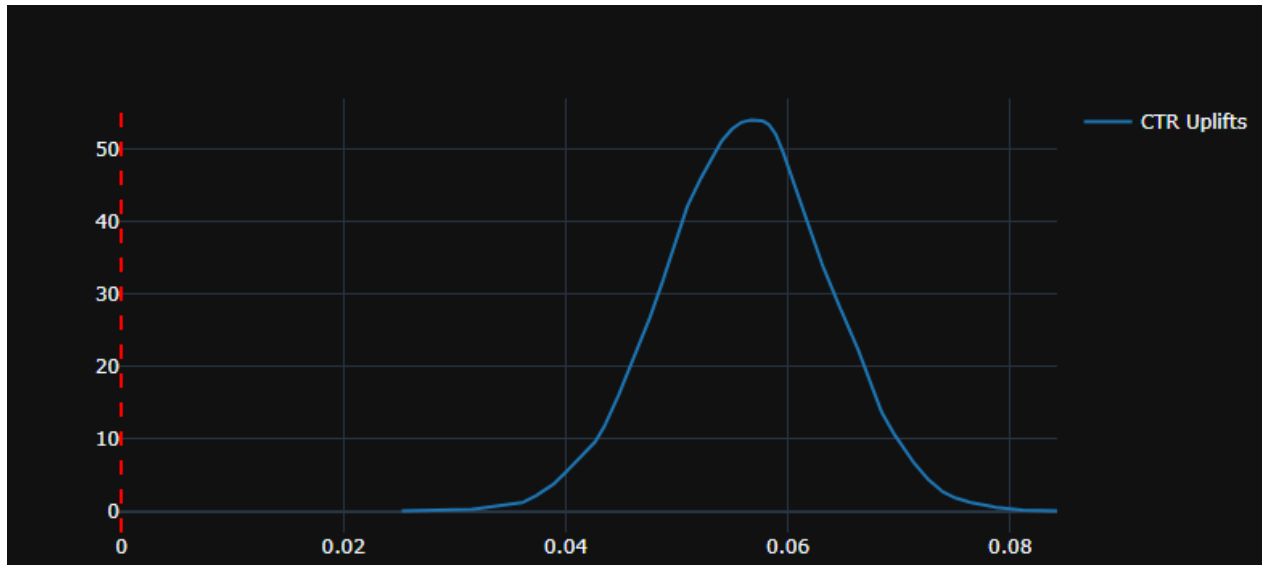
1. Overall Test-Level Results:

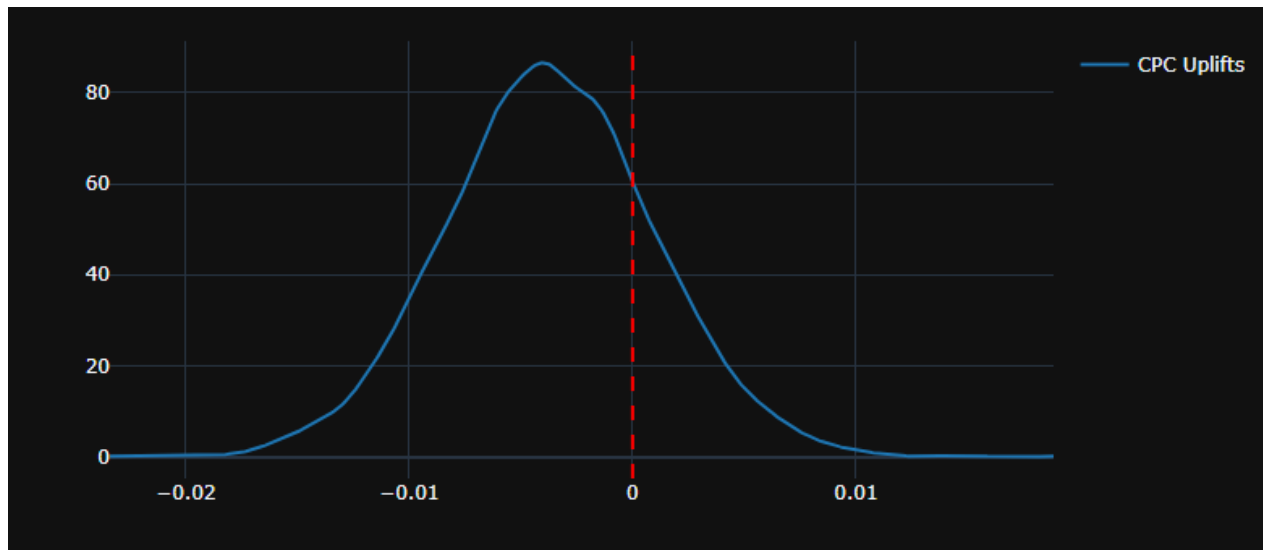


No statistically significant changes were observed at the total level.

2. Country-Specific Analysis:

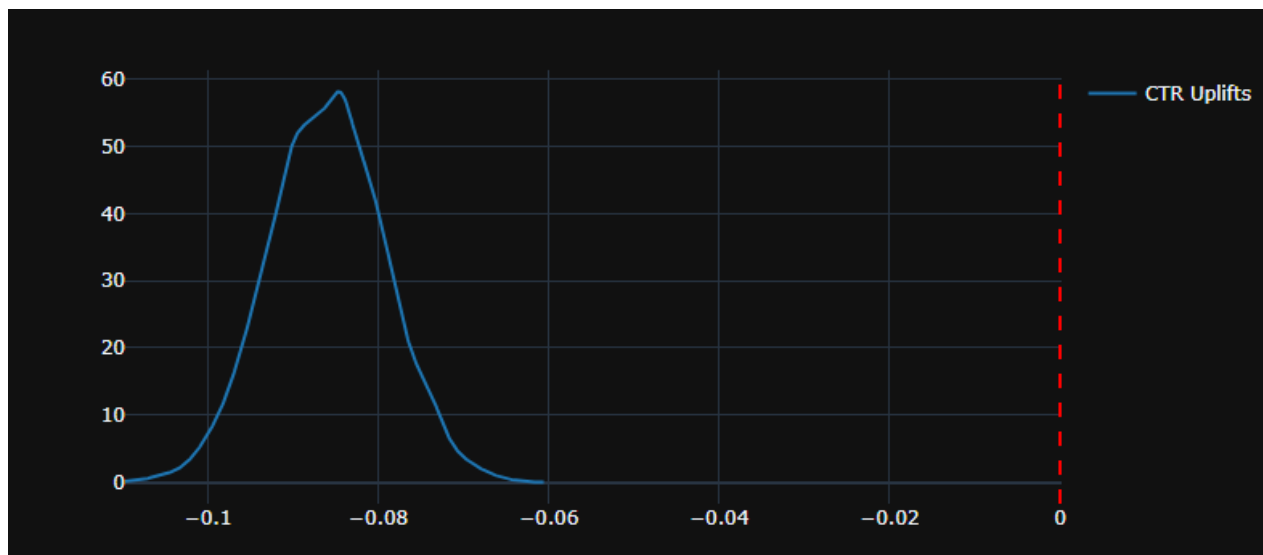
United Kingdom:

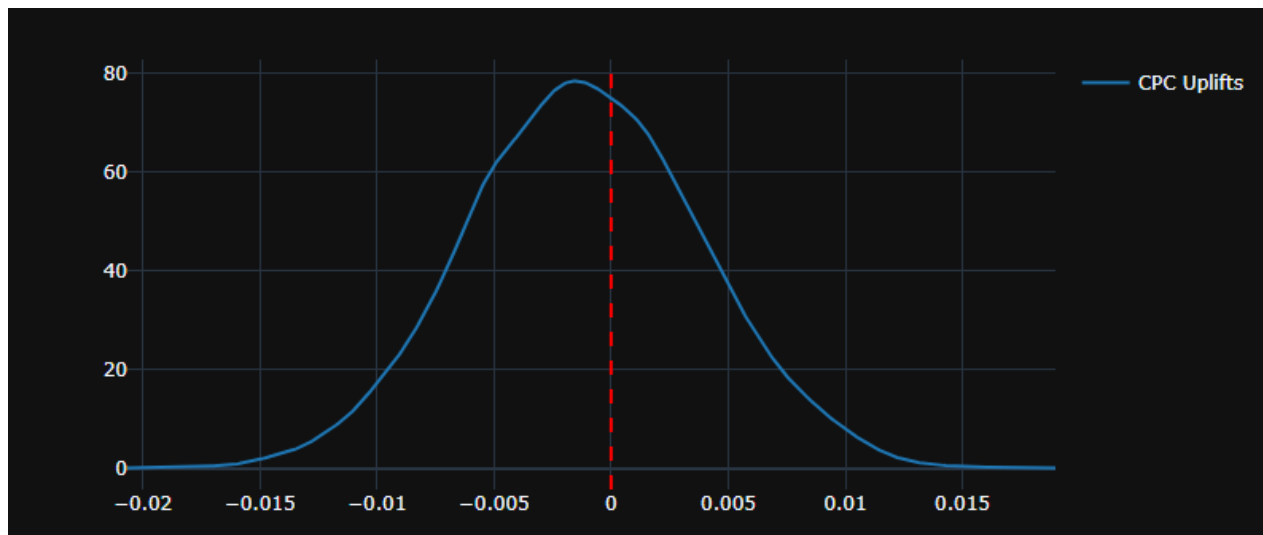
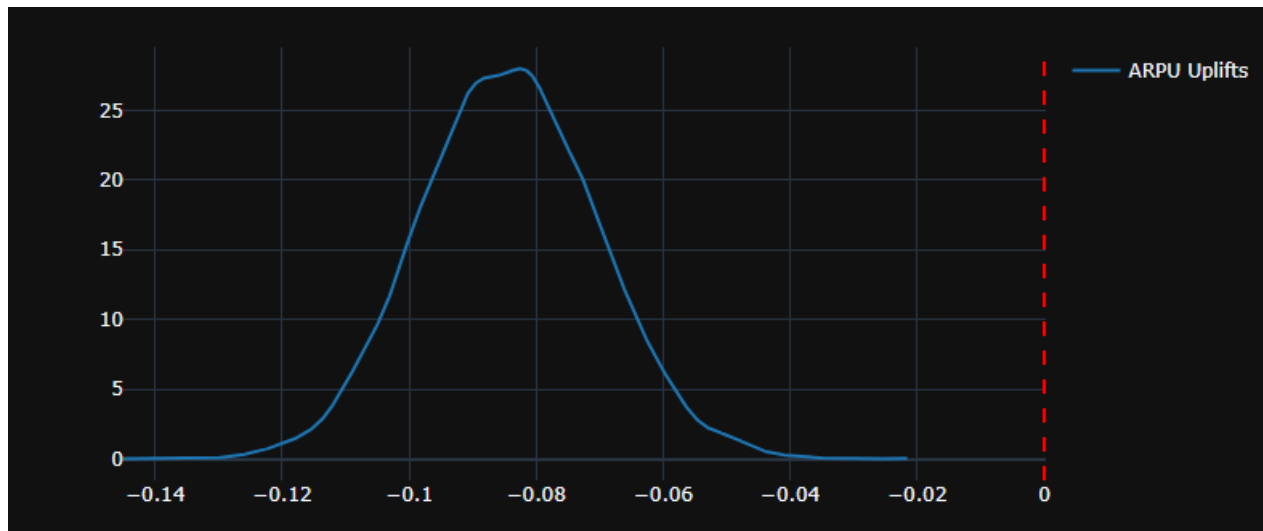




United Kingdom: Significant positive impact on CTR and ARPU.

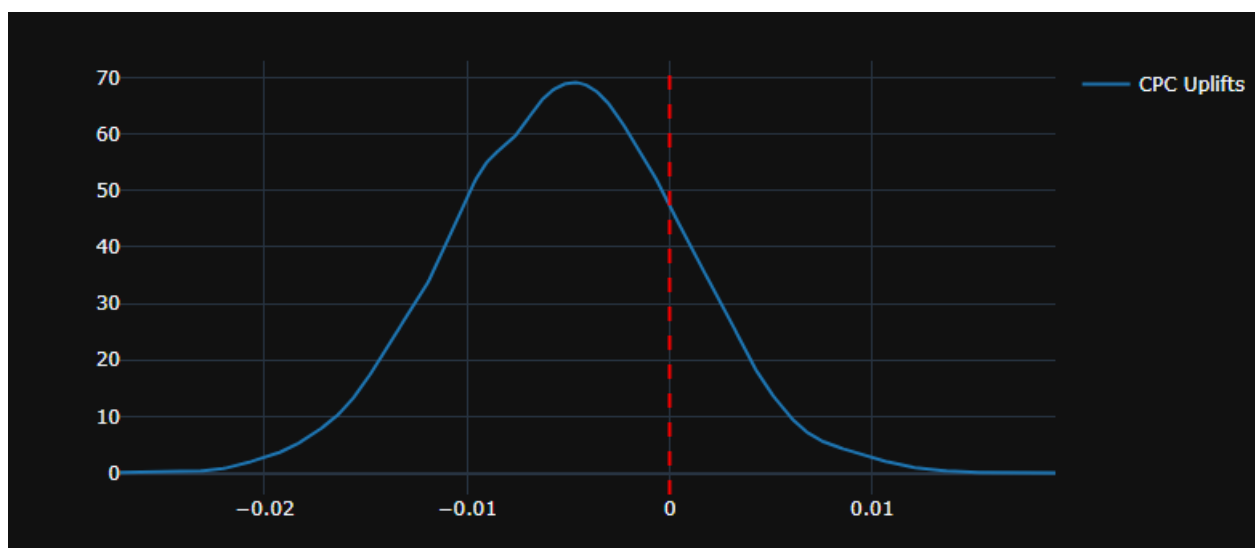
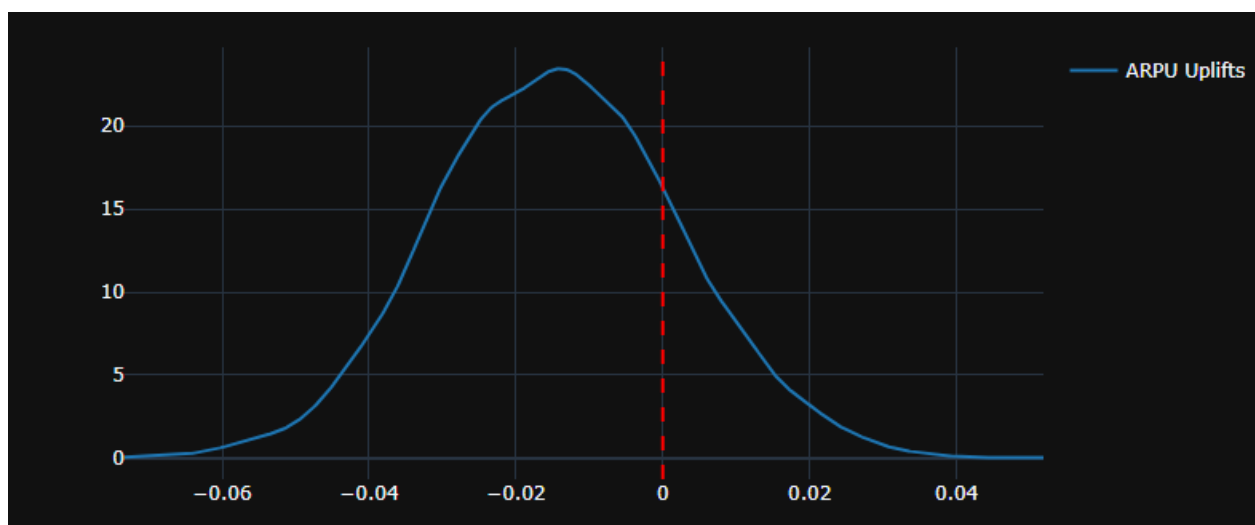
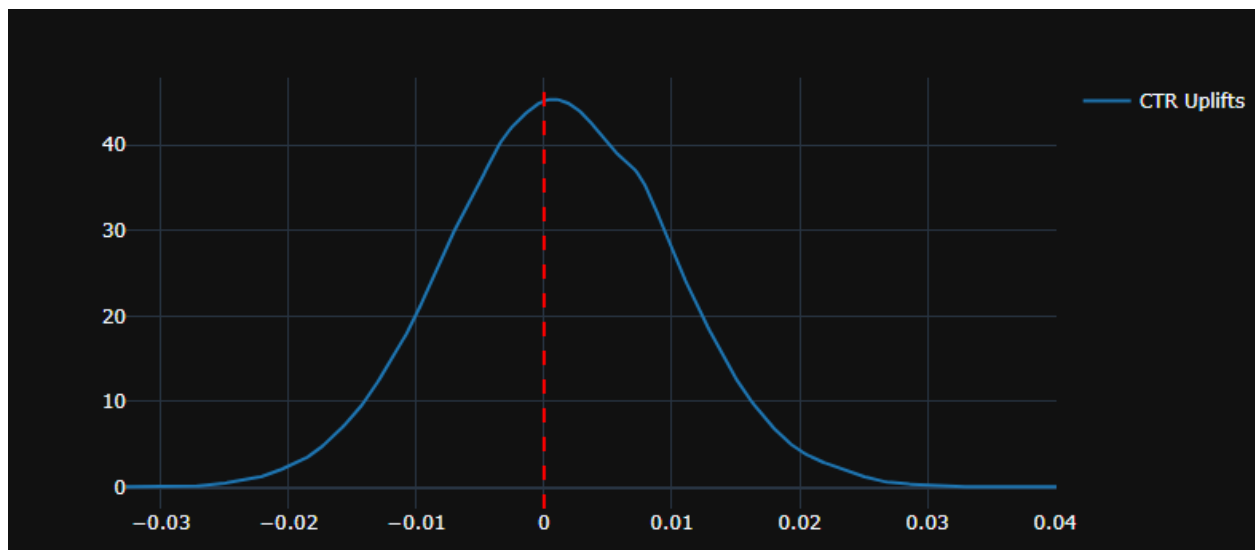
France:





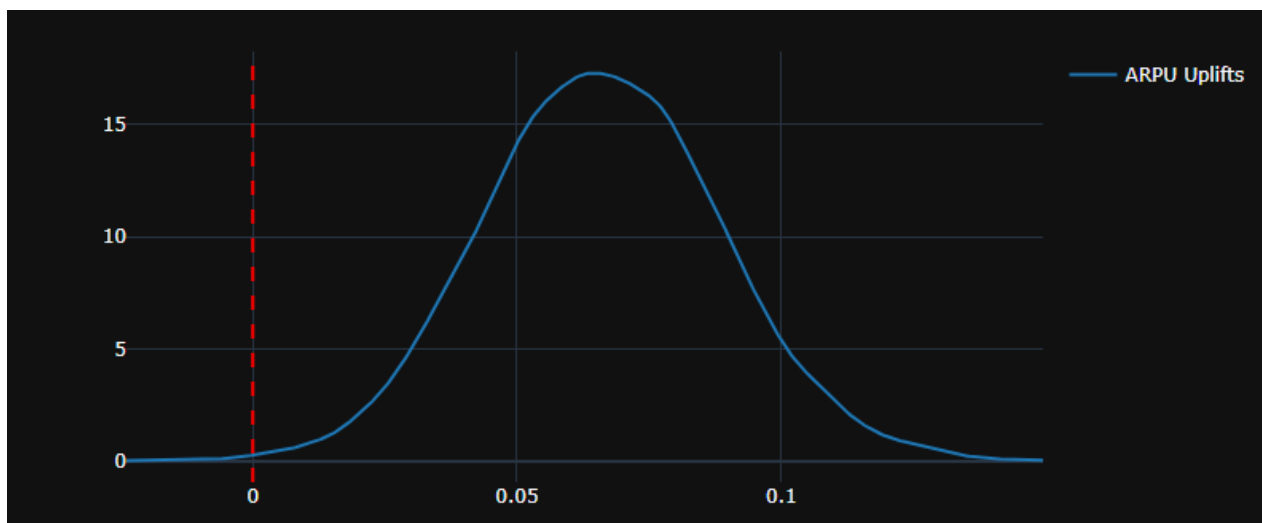
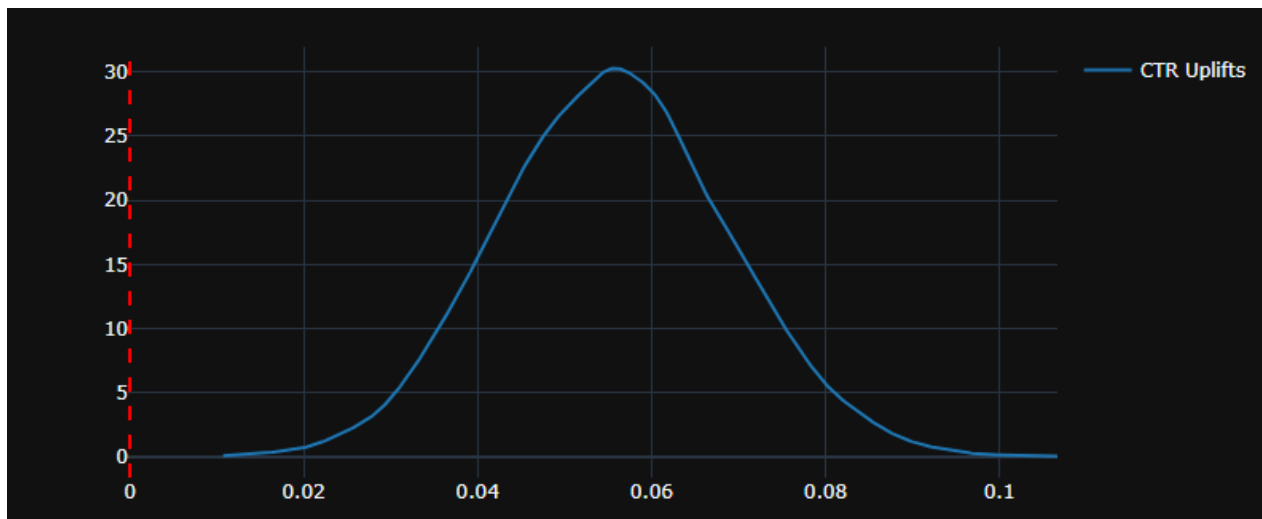
France: Significant negative impact on CTR and ARPU.

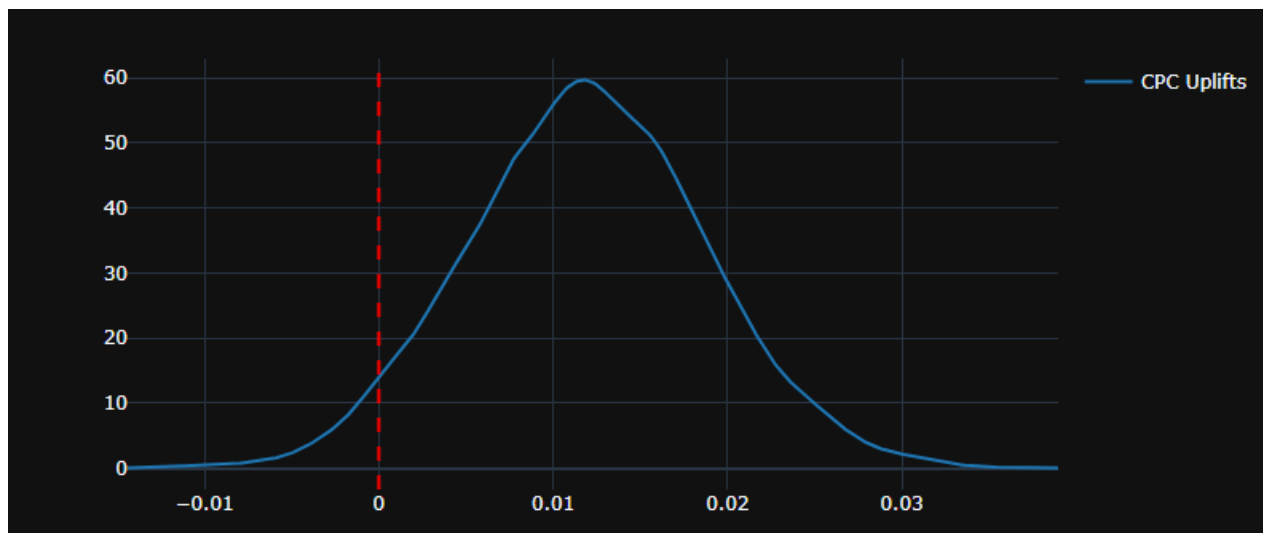
Germany:



Germany: No significant changes detected.

Australia:





Australia: Significant positive impact on CTR and ARPU.

Table with final results

We can notice that the results have changed. Therefore, in the table, I will highlight positive changes in green and negative changes in red. Columns where the test turned out to be statistically insignificant will remain gray.

Dimension	Metric_name	users	control	test	uplift	p_value	Significance
Total	CTR	50000	0.231354	0.231047	-0,13%	0.7534	$p \geq 0.05$
Total	ARPU	50000	0.181258	0.179980	-0,70%	0.3876	$p \geq 0.05$
Total	CPC	50000	0.050072	0.049986	-0,17%	0.521	$p \geq 0.05$
UK	CTR	16407	0.199120	0.210292	5,60%	0.0	$p \leq 0.05$
UK	ARPU	16407	0.198527	0.208624	5,10%	0.0	$p \leq 0.05$
UK	CPC	16407	0.049999	0.049811	-0,37%	0.4214	$p \geq 0.05$
Australia	CTR	8582	0.218041	0.230156	5,56%	0.0002	$p \leq 0.05$
Australia	ARPU	8582	0.109125	0.116312	6,62%	0.0012	$p \leq 0.05$
Australia	CPC	8582	0.049678	0.050270	1,19%	0.078	$p \geq 0.05$
France	CTR	14088	0.256540	0.234449	-8,61%	0.0	$p \leq 0.05$
France	ARPU	14088	0.206224	0.188777	-8,45%	0.0	$p \leq 0.05$
France	CPC	14088	0.050163	0.050102	-0,12%	0.8002	$p \geq 0.05$
Germany	CTR	10923	0.273747	0.274048	0,11%	0.8932	$p \geq 0.05$
Germany	ARPU	10923	0.178948	0.176339	-1,44%	0.3946	$p \geq 0.05$
Germany	CPC	10923	0.050250	0.049992	-0,51%	0.3668	$p \geq 0.05$

Recommendations

Implement the new design in the United Kingdom and Australia. Do not roll out the new design in France due to negative performance. Continue testing in Germany to gather more data before making a decision.