Streaking and Clutching in Round-Based First Person Shooter (FPS) Esports

Tony ElHabr

Game types

- Search and Destroy (SnD) in Call of Duty (COD)
 - 2020-2022 Call of Duty League (CDL) matches (qualifiers and majors)
 - 4v4.
 - First to 6 round wins
 - Teams swap sides (offense and defense) after every round
- Plant/Defuse in Valorant
 - Data from Valorant professional league, updated through January 1, 2022
 - 5v5
 - First to 13 round wins
 - One team plays offense in 12 consecutive rounds before swapping sides
 - Must win by 2 rounds

How does a team win a round of COD SnD / Valorant plant/defuse?

- 1. One team eliminates all members of the other team prior to a bomb plant.
- 2. The offensive team eliminates all members of the defensive team after a bomb plant.
- 3. The defensive team defuses the bomb after a bomb plant.

 Often the defensive team will try to eliminate all o team members prior to making the defuse, but in some cases, they may try to "ninja" defuse.
- 4. The offensive team does not make a plant by the time the round timer ends.

COD SnD data overview

• Total series: 784

• Total rounds: **7,179**

• Offensive plant %: **52%**

• Offensive win %: 48%

• Win % when planting: **66%**

• Win % when earning first blood: **73%**

What are your chances of winning a round, given the series state?

Offensive Round Win %									
Wins	38%	39%	42%	46%	52%	46%			
5	(13/34)	(37/95)	(49/118)	(76/166)	(99/192)	(88/192)			
Pre-Round Wins	44%	42%	49%	46%	57%	44%			
	(28/64)	(47/111)	(83/171)	(91/197)	(117/206)	(72/165)			
# of Pre-	44%	45%	47%	44%	46%	52%			
w	(48/109)	(84/188)	(113/240)	(101/229)	(97/212)	(80/155)			
Team's #	44%	51%	49%	50%	45%	45%			
N	(90/206)	(143/279)	(140/287)	(115/231)	(78/175)	(56/125)			
Defensive Te	46%	49%	49%	46%	57%	48%			
O L	(171/374)	(185/375)	(136/280)	(84/184)	(75/132)	(37/77)			
Defer	48%	50%	54%	55%	56%	44%			
O	(373/784)	(206/410)	(109/203)	(64/116)	(34/61)	(16/36)			
0 1 2 3 4 5									
Offensive Team's # of Pre-Round Wins Viz: @TonyElHabr Data: @IOUTurtle CDL SnD Major and Weekly matches, 2020 - present									

How do the empirical round results compare to expectation?

Offensive Round Win % Over Expected								
Wins	-10	-9	-6	-2	+4	-2		
5	(13/34)	(37/95)	(49/118)	(76/166)	(99/192)	(88/192)		
Defensive Team's # of Pre-Round Wins	-4	-6	+1	-2	+9	-4		
	(28/64)	(47/111)	(83/171)	(91/197)	(117/206)	(72/165)		
of Pre-	-4	-3	-1	-4	-2	+4		
w	(48/109)	(84/188)	(113/240)	(101/229)	(97/212)	(80/155)		
# 2	-4	+3	+1	+2	-3	-3		
	(90/206)	(143/279)	(140/287)	(115/231)	(78/175)	(56/125)		
nsive Te	-2	+1	+1	-2	+9	+0		
	(171/374)	(185/375)	(136/280)	(84/184)	(75/132)	(37/77)		
Defei	-0	+2	+6	+7	+8	-3		
O	(373/784)	(206/410)	(109/203)	(64/116)	(34/61)	(16/36)		
	0	1	2	3	4	5		
Offensive Team's # of Pre-Round Wins Viz: @TonvFIHahr Data: @IOLITurtle CDL SnD Major and Weekly matches, 2020 - present								
Viz: @TonyElHabr Data: @IOUTurtle CDL SnD Major and Weekly matches, 2020 - present								

What are your chances of winning the series, given the series state?

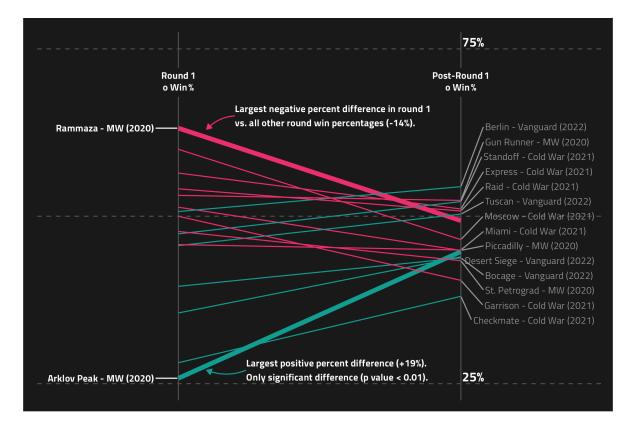
Offensive Series Win %								
Wins	0%	4%	5%	13%	21%	46%		
2	(13/34)	(37/95)	(49/118)	(76/166)	(99/192)	(88/192)		
Defensive Team's # of Pre-Round Wins	8%	5%	26%	25%	59%	70%		
	(28/64)	(47/111)	(83/171)	(91/197)	(117/206)	(72/165)		
of Pre-	9%	27%	35%	50%	63%	88%		
w	(48/109)	(84/188)	(113/240)	(101/229)	(97/212)	(80/155)		
sam's #	26%	38%	53%	60%	85%	92%		
7	(90/206)	(143/279)	(140/287)	(115/231)	(78/175)	(56/125)		
nsive Te	35%	54%	60%	75%	88%	99%		
	(171/374)	(185/375)	(136/280)	(84/184)	(75/132)	(37/77)		
Defe	52%	60%	75%	78%	100%	94%		
O	(373/784)	(206/410)	(109/203)	(64/116)	(34/61)	(16/36)		
	0	1	_ 2	3	4	5		
Offensive Team's # of Pre-Round Wins Viz: @TonyElHabr Data: @IOUTurtle CDL SnD Major and Weekly matches, 2020 - present								

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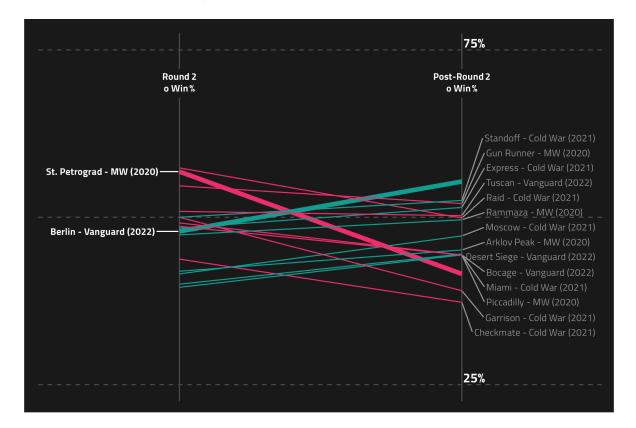
How do the empirical series results compare to expectation?

Offensive Series Win % Over Expected								
Wins	-2	+1	-1	+1	-4	-4		
5	(13/34)	(37/95)	(49/118)	(76/166)	(99/192)	(88/192)		
puno8	+2	-6	+7	-6	+9	-5		
	(28/64)	(47/111)	(83/171)	(91/197)	(117/206)	(72/165)		
Defensive Team's # of Pre-Round Wins	-5	+4	+0	-0	-6	+1		
	(48/109)	(84/188)	(113/240)	(101/229)	(97/212)	(80/155)		
# 2	+0	+2	+3	-6	+4	-2		
2	(90/206)	(143/279)	(140/287)	(115/231)	(78/175)	(56/125)		
nsive Te	-2	+4	-3	-2	-1	+2		
	(171/374)	(185/375)	(136/280)	(84/184)	(75/132)	(37/77)		
Defe	+2	-2	+1	-7	+6	-4		
O	(373/784)	(206/410)	(109/203)	(64/116)	(34/61)	(16/36)		
	0	1	2	3	4	5		
o Team's # of Pre-Round Wins Viz: @TonyElHabr Data: @IOUTurtle CDL SnD Major and Weekly matches, 2020 - present								

Are offensive win %'s different in round 1?



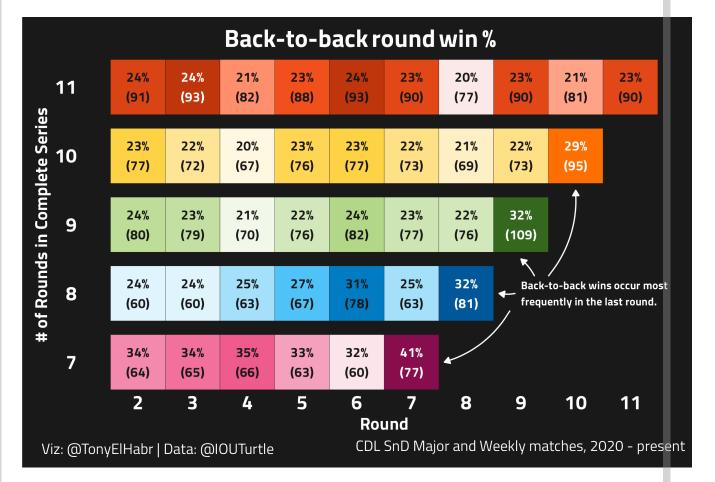
Are offensive win %'s different in round 2?



What are the most common series winning states?

How do end states compare to expectation?

When do back-to-back round wins occur?



Is there evidence for the "hot hand"?

• Round win % after a streak of 3 round wins:

• Expected: **38.4%**

• Actual: **55.7%** (352 / 632)

What is the optimal strategy?

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