ONTARIO

Superior Court of Justice

Affidavit

Form 15B Ont. Reg. No.: 258/98

Richmond Hill
Small Claims Court

SC23000002770000
Claim No.

8500 Leslie Street, Suite 395
Markham, Ontario L3T 7M8
Address

905-731-2664
Phone number

BETWEEN

MATTHEW BUCHALTER
Plaintiff(s)/Creditor(s)

and

AMERICAN WAGERING, INC., ALSO KNOWN AS CAESARS SPORTSBOOK
Defendant(s)/Debtor(s)

My name is **Matthew Daniel Buchalter**
(Full name)

I live in **Maple, Ontario**
(Municipality & province)

I make this affidavit in relation to: **the Defendant's motion to dismiss this action.**
(Specify why the affidavit is being filed with the court.)

and I swear/affirm that the following is true:
Set out the facts in numbered paragraphs. If you learned a fact from someone else, you must give that person's name and state that you believe that fact to be true.

Appendix "A"

Continued on next page

If more space is required, attach and initial extra pages.

Sworn/Affirmed before me (select one): ☑ in person **OR** ☐ by video conference

Complete if affidavit is being sworn or affirmed in person:

JB. at the Toronto (city, town, etc.) of Toronto, in the Province (County, Regional Municipality, etc.)
City of Ontario, on February 20, 2024 (date)

Signature of Commissioner (or as may be)

Signature of Deponent

Joseph Basaran

Continued on next page

Use one of the following if affidavit is being sworn or affirmed by video conference:

Complete if deponent and commissioner are in same city or town:

by _____ (deponent's name) at the _____ (city, town, etc.)

of _____ in the _____ (County, Regional Municipality, etc.)

of _____, before me on _____ (date)

in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely. _____

Commissioner for Taking Affidavits (or as may be)

_____ Signature of Commissioner (or as may be)

_____ Signature of Deponent

Complete if deponent and commissioner are not in same city or town:

by _____ (deponent's name) at the _____ (city, town, etc.)

of _____ in the _____ (County, Regional Municipality, etc.)

of _____, before me at the _____ (city, town, etc.)

of _____ in the _____ (County, Regional Municipality, etc.)

of _____, on _____ (date) in accordance

with O. Reg. 431/20, Administering Oath or Declaration Remotely. _____

Commissioner for Taking Affidavits (or as may be)

_____ Signature of Commissioner (or as may be)

_____ Signature of Deponent

WARNING: IT IS AN OFFENCE UNDER THE *CRIMINAL CODE* TO KNOWINGLY SWEAR OR AFFIRM A FALSE AFFIDAVIT.

Appendix "A"

1. I am the individual plaintiff in this action and, as such, have knowledge of the matters contained in this affidavit unless they are based on information and belief, in which case I have stated the source of the information and believe it to be true.

2. I have read the affidavit of Lisa Rankin filed on behalf of the defendant in support of its motion. While Ms. Rankin refers to the defendant in this action as "AWI", I am referring to the defendant by its business name through which I placed wagers, "Caesars".

3. Ms. Rankin states in paragraph 3 of her affidavit that I "purport to be a professional gambler". My primary *profession* is that of an actuary. I am credentialed as an actuary by the Canadian Institute of Actuaries and have full-time employment within that profession.

Public Interest In My Online Profile and this Matter Should Not Bar Its Adjudication

4. My motivations for bringing this claim are, first and foremost, to seek recovery of amounts that I believe have been wrongfully retained by Caesars. While the amount at issue in this claim is "relatively insignificant" for me, it is still money that I believe has been unjustly retained by Caesars.

5. My belief is that this action and motion reflect the imbalance of power between myself and Caesars. To the extent that the outcome in this matter is of interest to Caesars' other bettors or potential customers in this Province, I believe they deserve to be informed about how this action progresses (barring any rule or order to the contrary[1]). My

[1] I have, of course, respected the confidentiality of the settlement conference held in this matter, as provided for under the *Rules of the Small Claims Court*.

respectful view is that it is just for others impacted or potentially impacted by Caesars conduct to be apprised of the merits of this matter.

6. Ms. Rankin has filed evidence about my online profile. As of the time of swearing this affidavit, I have made more than 28,800 posts on X (formerly known as Twitter) and have more than 23,000 followers.

7. The suggestion made to this court by Caesars that my followers on X are somehow the result of "publicity" from this case is misleading. My posts and other comments about this action and the underlying facts do not constitute more than a couple of dozen of my more than 28,800 posts, or less than 0.1%.

8. One of my key interests in online gaming is the use of analytics and data in gambling markets, as one may infer from my actuarial background. Indeed, I have published a number of articles regarding related topics and have taught a course on "Art of Sports Betting Analytics". A recent article of mine published on Wordpress on February 3, 2024 entitled "Sampling using Tightness and Boost" is attached as **Exhibit "A"** hereto. I am attaching this article to demonstrate to this Honourable Court that the general focus of my online presence does not concern Caesars and any suggestion to the contrary is untrue. As of the moment of me swearing this affidavit, the X post promoting the Wordpress article has been viewed more than 18,000 times.

9. The sports gambling industry is relatively nascent in Ontario and myself and other bettors are interested in ways to safely place wagers. For that reason, my online posts address a number of points of public interest to the gambling public including, but not limited to

the conduct of online operators who have acted to the detriment of Ontario's bettors, many of which are not at issue in this litigation.

This Case In A Nutshell

10. This case is fundamentally about Caesars refusing to treat my wagers consistently.

11. I placed a number of wagers on NFL football in June, July and August 2022.

12. Each of the wagers I placed contain an explicit clause "must play 17 games for action" (stated on the bet slip as well as in the specifically pertinent sections of Caesars' House Rules for the bet types in question). This condition was not met. Different bets which contained the condition were treated differently. The merits of this action concern Caesars' inconsistent treatment of this clause and the appropriate remedy, if any.

Caesars Has Not Disclosed Relevant Information About iGaming Ontario To The Court

13. In its Summary of Argument, Caesars refers to alleged correspondence with the AGCO which "resulted" in its decisions that are at issue in this matter. Ms. Rankin says that certain information was that which Caesars "had previously provided to the AGCO on January 11, 2023 and which the AGCO had confirmed it had no concerns with".

14. The suggestion from Caesars' argument is that it has had correspondence with the AGCO which justifies its unjust enrichment in this matter.

15. The correspondence relied upon by Ms. Rankin has not been disclosed by Caesars with its pleading (as I understand may be required by the Rules of the Small Claims Court), nor is it attached to Ms. Rankin's affidavit. I therefore have no ability to test Ms.

Rankin's statements about Caesars' interactions with the AGCO or the suggestion that those interactions somehow impact the merits of my claim.

16. Caesars also relies upon the "iGaming Ontario Customer Care and Player Dispute Resolution Policy". This document is also not attached to Ms. Rankin's affidavit. Despite extensive online searching, I have been unable to locate a copy of this purported policy.

iGO Doesn't Compensate Bettors

17. In any event, Caesars has also omitted important information reflecting iGO's role in the adjudication of disputes in the Province of Ontario. Contrary to the arguments made by Caesars, iGO's adjudication does not provide me (or any other bettor) with possibility of compensation.

18. iGaming Ontario's website states:

"iGO cannot directly settle any bets, refund wagers or award compensation"

I have attached a printout from iGaming Ontario's website located at https://igamingontario.ca/en/player/player-support#:~:text=iGaming%20Ontario's%20Complaints%2FDisputes%20Service,with%20their%20customer%20service%20department, retrieved on February 5, 2024 as **Exhibit "B"**, containing this statement.

19. iGaming Ontario also states that the making of a complaint to iGaming Ontario does not bar a complaint to the Ombudsman of Ontario:

"Please note that this process does not affect your right to raise your concerns with the Ombudsman of Ontario if you are dissatisfied with the results provided by iGO."

I have attached another printout from iGaming Ontario's website, this one located at https://igamingontario.ca/en/igaming-ontarios-complaintsdisputes-service-standards, retrieved on February 5, 2024, as **Exhibit "C"**, containing this statement.

20. I have reviewed iGO's website and have not identified any appeal process which could result in me receiving compensation for Caesars' conduct through iGO.

21. As a result, Caesars is asking this honourable court to use a process which cannot afford me compensation and which does not even prohibit a complaint to the Ombudsman of Ontario as a bar to this action.

22. Deputy Judge Jamal Karmali did not have any information about iGO's role in adjudicating complaints before her when she permitted Caesars to bring this motion.

An Arbitration Is Not Available And Entirely Contrary To My Ability To Receive a Remedy

23. Caesars has asked this Honourable Court to stay this action in favour of arbitration in circumstances where it knows that arbitration is not available and where the practical effects of the arbitration clause bar me from having this matter adjudicated.

24. The arbitration clause in this case was not negotiated by the parties. It was agreed to as part of my general agreement of terms and conditions related to use of the Caesars' platform.

25. Some characteristics of the arbitration urged by Caesars in this motion are:

(a) The arbitration is to be administered by ICDR Canada pursuant to its Canadian Arbitration Rules; here is no carve out for small claims court proceedings.

(b) The clause requires that an arbitration be commenced within one (1) year after such claim or cause arose or you waive such claim or cause of action, including the ability to arbitrate the matter. Caesars *could have* brought this motion immediately upon receipt of my Plaintiff's Claim. Because Caesars brought this motion so late in this action, more than one year has passed since my claim arose. If Caesars is successful in its argument to stay this action in favour of arbitration, I expect that it will take the position that any arbitration regarding the within issues is barred due to the passage of time. This would be permitting Caesars to benefit from its own delay in bringing this motion, and bar my access to any adjudication entirely.

(c) According to the ICDR Canada Fee Schedule attached as Exhibit "I" to Ms. Rankin's affidavit, the costs of the arbitration are likely to eclipse any amount I may recover. The filing fees alone are $2,000 USD. Arbitrator compensation is not included this amount.

(d) The prevailing party in the arbitration is entitled to "reasonable legal fees and expenses". In this case, Caesars has retained the law firm of Blake, Cassels & Graydon LLP. Although I have no knowledge of the actual rates charges by the defendant's firm to the defendant, I expect that it is in the magnitude of hundreds of dollars per hour.

(e) The arbitration clause purports to exclude the application of the United Nations Convention on Contracts for the International Sale of Goods, if otherwise applicable.

26. As a result of the foregoing, due to timing, cost and procedure, an arbitration process is all-but-inaccessible to me with respect to this matter. It was Caesars that designed and drafted the contract. They now seek to use it, in conjunction with a misstatement of the role of iGO, to bar any decision-maker from ever ordering that they pay compensation for amounts which I am arguing have been wrongfully retained.

27. I am eager to have this case tried on its merits and am willing to take all appropriate steps to that end as the court may direct.

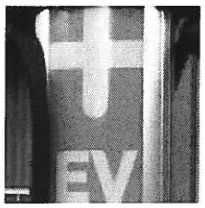
This is Exhibit "A" to the Affidavit of

Matthew Buchalter

Sworn before me, this 20th day of February, 2024

A Commissioner for taking Affidavits

Joseph Basaran



Plus EV Analytics

Sampling using Tightness and Boost

A good practitioner wants to have as many tools in their toolbox as possible, so today I'm going to set aside my avowed Bayesianism and be a frequentist. It's not blasphemy, it's diversity. Let's dive in.

It's Super Bowl week, the Super Bowl of football games. And with it comes the year's deepest menu of props and derivatives. We're going to leave the player props for another day and focus on game props...so pretty much any bet that's not about specific player(s).

Let's start with a hypothetical example: *"What is the probability that a -7.5 favourite in a game with 44 total will cover -17.5?"*

There are several ways we could approach this. We could model the likelihood of each possible final score using some kind of probability distribution and/or regression. And that would work fine if done properly, but I want to think bigger. I want something that is flexible enough to answer not only this question but pretty much any other question you could ask about a game with a line of -7.5/44, no matter how complex. We could build a simulation, but that is much easier said than done and the results of any simulation will only be as good as the WORST assumption that goes into building it. We're going to build the simplest possible type of model, an empirical one. Find a sufficient set of games that happened in the past and count how often the thing in question occurred in those

How do we define "sufficient"? In my mind, there are two requirements for an empirical sample:

1. Credibility. The sample has to be large enough that when I calculate the proportion of times something happens, that proportion has to be at least somewhat stable. That means the sample has to be large enough, intentionally not defining what "enough" is.
2. Applicability. It won't help much to look at past games that were lined -2/56, or games that happened in 1947. We want our sample to look as similar to today's game as possible.

Note that there's a natural tension between credibility and applicability. If I pick "games from this year that were lined exactly -7.5/44", I'll get very high applicability and very low credibility. If I pick "every NFL game ever played", I'll get very low applicability and very high credibility. Both of those are terrible ideas. It's a balancing act.

What follows is my own method for picking "a sufficient set of games". It's applicable to pretty much any sport, and I made it up myself (apologies if anyone has done something like this before and I've just not noticed it). It's far from perfect, and suggestions for improvement are always welcome.

Let's start simple and build from there. We can think of the closing spread and the closing total as axes on a two-dimensional graph, like we did **here**. Every game in our historical data set is a point on the graph. Actually, every game in our historical data set is two points on the graph because a game that is lined 3/52 is both -3/52 from one team's perspective and +3/52 from the other team's perspective.

Today's game is (-7.5, 44). Are there any other games on the exact same point? Yes, there are six of them.

Date	Teams	Spread	Total	Final Score
2020-09-20	JAX @ TEN	TEN -7.5	44	33-30 TEN
2017-09-28	CHI @ GB	GB -7.5	44	35-14 GB
2016-11-10	CLE @ BAL	BAL -7.5	44	28-7 BAL
2016-10-16	SF @ BUF	BUF -7.5	44	45-16 BUF
2015-12-06	CIN @ CLE	CIN -7.5	44	37-3 CIN
2008-01-12	SEA @ GB	GB -7.5	44	42-20 GB

I swear I didn't cherry pick this example, it just worked out this way!

So there you have it, 5 out of 6 covered the -17.5, so the probability is 83%. Done. Grab those +300 alt spreads now before the books realize what a mistake they've made.

Of course that's not true. The probability is not 80%, nor is the probability of a -7.5/44 favourite on the money line 100% even though they went 6-0 here. Our frequentist prediction is garbage because our sample size is way too small.

So let's **embiggen** the sample. Instead of looking only at points that are identical to (-7.5, 44), let's look at points that are near by drawing a circle around that point. Those of you who weren't asleep or stoned during high school math class may remember how to do that: you pick a radius, and you select all games that meet the condition

$$sqrt((spread - (-7.5))^2 + (total - 44)^2) <= radius$$

How do you pick a radius? Again, it's a trade-off. Smaller radius gets you more relevant points at a cost of smaller sample size. For this example I chose radius = 3, which results in a sample of 775 games inside my circle. You could just try different values until you get a circle you're happy with, or you could find (by trial and error, or using a numerical solver) the smallest radius that meets some minimum

First, the small reason. By drawing a circle, we've implemented a binary rule for which points to count. (-9.5, 46) is in, but (-9.5,46.5) is out. Our choice of radius is informed but still somewhat arbitrary. And, the points that are inside the circle but closer to the edge, like (-9.5, 46), count the same as those six points that are right at the center of (-7.5, 44). What we should really have is a weighting scheme that gives more emphasis to closer points to the center and smoothly decreases the weight as you move outward. While we're at it, should (-10.5, 44) be treated the same as (-7.5, 47)? They both have a distance of 3 and they're both on the outer edge of the circle, but are they really "equally close" to our center point of (-7.5, 44)? Maybe our circle should be flatter on one axis and wider on the other, like an oval?

Now, the big reason. Let's do a few more queries on our sample of 775 games:

Condition	Proportion
Spread larger than -7.5	24.6%
Spread exactly 7.5	12.4%
Spread smaller than -7.5	63.0%
Total below 44	45.0%
Total exactly 44	11.4%
Total above 44	43.6%

So we have a problem in that our circle is a bit lopsided, not because of anything we did but because of the natural distribution of spreads and totals. There are more games out there at -6.5 than there are at -8.5, etc. In fact, our sample has an average spread of -7.13 and an average total of 44.02***. This problem would be even worse the more extreme the spread and/or total are of today's game – imagine how lopsided we'd be if we were centered at -13.5/36 instead. We need to find a way to restore balance to the sample.

*** FOR NERDS ONLY, NON-NERDS PLEASE SKIP TO THE NEXT PARAGRAPH. Why do we care about the average? Don't we usually prefer to look at the median [

exact total of 44 so we're trying to synthetically create one by adding some 43s and some 47s. to our 44s. If we had as many 43s in our aggregation as 47s, our median would be 44 but I wouldn't be happy with the aggregate performance as an estimate of how the 44 would fare. If we had 3x as many 43s as 47s, I'd be a lot happier with that. So, I'm using the mean here instead of the median to evaluate how balanced the sample is.

So there's two reasons why the "draw a circle" method of sampling isn't great. What we're about to do is solve both of those problems at the same time, plus a few more that I haven't even mentioned yet. Because at its core, what we're doing by sampling is taking each data point in our entire set of 9,720 observations and assigning each point either a 1 (in the sample) or a 0 (not in the sample), then using those 1s and 0s as weights to calculate a weighted average of the thing we're interested in (for example, the probability of covering -17.5). But, none of the math we're doing REQUIRES that our weights be 1s and 0s. It would be awkward if any of them were negative, but that's pretty much the only restriction. So we're going to come up with a way of assigning to each of the 9,720 points a weight that's not necessarily 1 or 0, but could be any non-negative number.

What do we want this weighting system to look like? Well, based on our trials and tribulations above we can outline some desired outcomes:

- We want to give more weight to points closer to the center, smoothly decreasing in weight as we move outward
- All else equal, we want to give more weight to proximity to the center on the spread and less weight to proximity to the center on the total
- We want to give more weight to more recent data points, for two reasons. Rules have changed over time (most recent significant example: the PAT distance) and strategies have changed over time (most recent significant example: Mr. Dan Campbell).
- We want...scratch that, we NEED to be balanced on both dimensions. Meaning, the weighted average spread must equal today's game spread and the weighted average total must equal today's game total.
- We want a sample size that's large enough to be predictive. What does "sample size" even mean when different points in your sample have different weights? I could have a thousand points but if one is 1.000x the weight of the others, my

Effective sample size = (sum of weights)^2 / (sum of squared weights)

- We want something customizable. Want to up-weight home teams off a bye or down-weight teams on the road coming off a big loss, for some reason? It would be nice if you could do that with minimal fuss.

The best way to build something like this is to use a modular approach. The final weight assigned to each individual data point will be the product of five components, each of which can be modified to fit our needs.

Recency weight: Gives more weight to more recent data points. Exponential decay is a common method for doing this, where recency weight = 0.5^(elapsed time / half-life). I've chosen a half-life of 5 years. Then, because there was a significant rule change in 2015 with the moving of the XP back to the 33 yard line, I cut the weight of all pre-2015 data in half.

Applicability weight: Gives more weight to points that are closer in spread and total to today's game, with the spread dimension being twice as important as the total dimension. So, distance = sqrt((spread – today's spread)^2 + 0.5*(total – today's total)^2) and applicability weight = exp(-distance * tightness). What is tightness? It's a parameter that controls the size of our circle. For lower values of tightness, the circle is larger, we're giving substantial weight to more points, our credibility will be higher and our applicability will be lower. For higher values of tightness, the circle is smaller, we're giving substantial weight to fewer points, our credibility will be lower and our applicability will be higher.

Boost(spread): Equals boost_spread for games with spread below today's spread and 1/boost_spread for games with spread above today's spread. What this will do is up-weight and down-weight where it's needed to achieve balance.

Boost(total): Same as boost(spread) but for total instead of spread. Equals boost_total for games with total below today's total and 1/boost_total for games with total above today's total.

Custom weight: This is where you can build any rules you want to up-weight or down-weight anything. Because today's game is a playoff game and those can play

Total weight =

recency weight * applicability weight * boost(spread) * boost(total) * custom weight

That specifies the weighting algorithm, but it leaves 3 parameters that don't yet have specified values: **tightness, boost_spread** and **boost_total.** We're going to use a numerical optimizer to find the combination of those 3 values that meets an objective.

The objective has three parts. Most importantly, the resulting set of weights must be balanced for both spread and total, meaning that weighted average spread = today's spread and weighted average total = today's total. Of secondary importance, we want to pick our effective sample size. This is more subjective and it's where the rubber hits the road in terms of the tradeoff between credibility and applicability. For this application of pricing a -17.5 alt line, I'm not looking for super-rare tail events so I'd rather have greater applicability instead of a super massive sample. I set my target sample size at 300.

Because I'm not super handy with constrained-optimization algorithms in R, I take the fudgey way out and hack together an objective function that meets these requirements:

*abs(effective sample size – 300) + 1000*abs(weighted average spread – (-7.5)) + 1000*abs(weighted average total – 44).*

I use the optim function in R to find the set of parameters that minimizes that objective function:

tightness = 1.346

boost_spread = 1.681

boost_total = 1.150

That gives me a set of weights that is fully balanced (to the 5th decimal place at

Now, back to the Super Bowl. I'm going to illustrate how this works by pricing one of the silliest of all game props, the Super Bowl Square. You're betting on the exact combination of the last digit of the 49ers final score and the last digit of the Chiefs final score, so there are 100 possible outcomes. Because we have to price so many different outcomes, some of which will be quite rare, I'm going to shift my preferences away from applicability toward credibility by changing my target effective sample size from 300 to 1,000.

Optimizing that along with the current line of SF -2/47.5 gives:

tightness = 0.568

boost_spread = 0.924

boost_total = 0.635

resulting in an average spread of -2, an average total of 47.52 (close enough) and an effective sample size of 1,000.

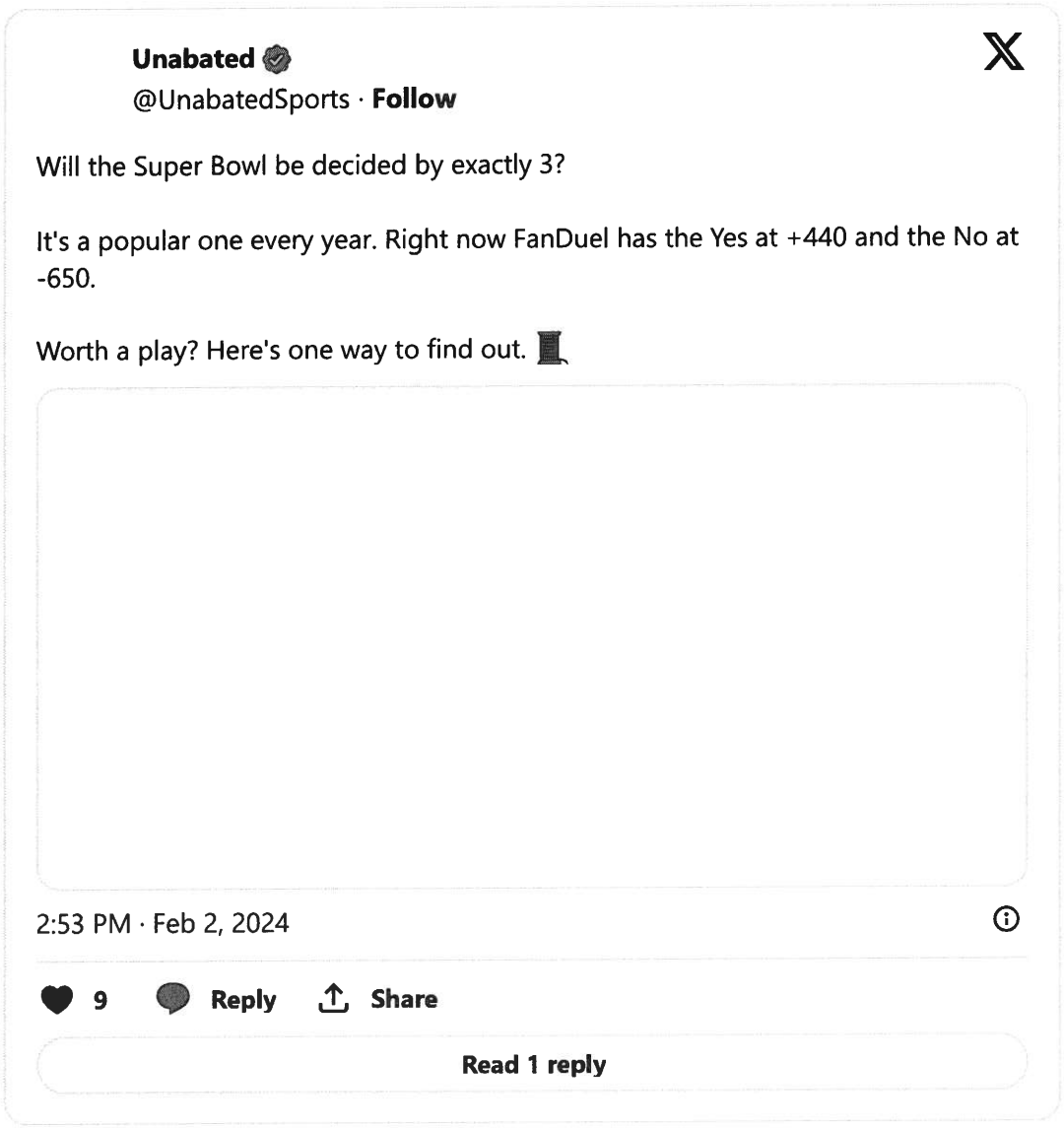
		KC									
		0	1	2	3	4	5	6	7	8	9
SF	0	68/1	80/1	156/1	35/1	41/1	138/1	63/1	26/1	107/1	100/1
	1	78/1	71/1	564/1	97/1	37/1	293/1	154/1	68/1	68/1	356/1
	2	126/1	169/1	3201/1	174/1	134/1	306/1	255/1	133/1	166/1	311/1
	3	34/1	142/1	162/1	168/1	64/1	155/1	110/1	79/1	96/1	110/1
	4	34/1	37/1	256/1	55/1	99/1	210/1	63/1	27/1	69/1	246/1
	5	152/1	428/1	180/1	227/1	187/1	1239/1	310/1	127/1	154/1	467/1
	6	62/1	111/1	133/1	68/1	148/1	167/1	124/1	84/1	201/1	140/1
	7	23/1	86/1	145/1	45/1	29/1	148/1	80/1	90/1	193/1	103/1
	8	129/1	98/1	200/1	165/1	132/1	143/1	123/1	155/1	188/1	396/1
	9	153/1	249/1	229/1	131/1	255/1	428/1	98/1	85/1	978/1	248/1

For comparison, we can calculate the un-weighted average frequency the same way:

		KC									
		0	1	2	3	4	5	6	7	8	9
SF	0	50/1	98/1	130/1	30/1	42/1	135/1	58/1	28/1	95/1	126/1
	1	98/1	137/1	261/1	79/1	45/1	201/1	148/1	63/1	96/1	205/1
	2	130/1	261/1	2429/1	284/1	189/1	372/1	230/1	141/1	284/1	248/1
	3	30/1	79/1	284/1	82/1	74/1	230/1	67/1	41/1	126/1	123/1
	4	42/1	45/1	189/1	74/1	80/1	201/1	89/1	31/1	102/1	150/1
	5	135/1	201/1	372/1	230/1	201/1	809/1	248/1	144/1	205/1	387/1
	6	58/1	148/1	230/1	67/1	89/1	248/1	130/1	78/1	205/1	144/1
	7	28/1	63/1	141/1	41/1	31/1	144/1	78/1	50/1	134/1	92/1
	8	95/1	96/1	284/1	126/1	102/1	205/1	205/1	134/1	323/1	346/1
	9	126/1	205/1	248/1	123/1	150/1	387/1	144/1	92/1	346/1	302/1

So it's no surprise that I see some value on the 1,1 square, I've seen up to 100/1 there.

We can do a lot of things with these weights.



To evaluate this "will the margin be exactly 3" prop using these weights takes exactly one line of code:

```
sum(weights*(abs(weightings$score-
weightings$opp_score)==3))/sum(weights)
```

which gives 17.6% for fair odds of +466/-466.

weightings2024 Download

In case anyone was curious, the highest weights are going to:

- KC -2 / 48.5 vs CIN in last year's AFC championship
- MIN-2.5 / 48 vs NYG in last year's wild card round
- CIN -2 / 47.5 vs CLE in week 1 of this season

You can do this for pretty much any sport. There might be some, like hockey or baseball, where it makes more sense to use money line and total as your two dimensions instead of spread and total – no problem! The best way to use a money line in a model like this is probably to convert it to an implied probability, and then either use those implied probabilities as-is in place of "spread" in everything we've done above or, if you want to get fancy, convert them to a logit scale and use the logit-transformed implied probabilities as your "spread".

IMPORTANT WARNING: The biggest weakness of this type of approach is that it will tend to overestimate probabilities of extreme tail events. This will be a bigger problem the larger your target effective sample size is (i.e. the wider you draw your circle). To understand why, think about what we're doing – we're compensating for not having enough games of exactly -2/47.5 by averaging games that are (let's say) -2/42.5 balanced out by games that are -2/52.5. If you're pricing something like "will there be at least 70 points", this averaging will break down a little bit because you're artificially adding variance – variance among the points within your circle. That added variance will overestimate probabilities of tail events. As an example, I re-did the "will the margin be exactly 3" question with a target effective sample size of 300 instead of 1,000, and it came out as 18.2% probability. Margins of 3 and -3 are close to the center of the distribution, so they are the opposite of extreme tail events. It's a good idea to do this kind of sensitivity analysis by answering the same question with different parameters and seeing how similar the outcomes are. If you want to get SUPER precise and nerdy, you could run this with a bunch of different target effective sample sizes and try to extrapolate what the result would be with an effective sample size of zero – that would be the closest to the true number without any of the extra variance.

Here's the R code that did everything in this article.

```
library(dplyr)
library(lubridate)

rawdata=read.csv("C:/Users/mbuch/Downloads/nfl.csv") #Downloaded from
http://www.aussportsbetting.com/historical_data/nfl.xlsx
rawdata$game_date=rawdata[,1]
rawdata$Home.Line.Close[is.na(rawdata$Home.Line.Close)]=rawdata$Home.Line.
Open[is.na(rawdata$Home.Line.Close)]
rawdata$Total.Score.Close[is.na(rawdata$Total.Score.Close)]=rawdata$Total.
Score.Open[is.na(rawdata$Total.Score.Close)]

workdata=rawdata %>%
  mutate(spread=Home.Line.Close,total=Total.Score.Close,
         team=Home.Team,opp_team=Away.Team,
         score=Home.Score,opp_score=Away.Score,
         date_formatted=strptime(game_date,format="%Y-%m-%d"),
         season=ifelse(month(date_formatted)
<3,year(date_formatted)-1,year(date_formatted))) %>%

select(date_formatted,spread,total,team,opp_team,Home.Team,score,opp_score
,Overtime.,Playoff.Game.,Neutral.Venue.,season)
workdata_mirror=rawdata %>%
  mutate(spread=-Home.Line.Close,total=Total.Score.Close,
         team=Away.Team,opp_team=Home.Team,
         score=Away.Score,opp_score=Home.Score,
         date_formatted=strptime(game_date,format="%Y-%m-%d"),
         season=ifelse(month(date_formatted)
<3,year(date_formatted)-1,year(date_formatted))) %>%

select(date_formatted,spread,total,team,opp_team,Home.Team,score,opp_score
,Overtime.,Playoff.Game.,Neutral.Venue.,season)

workdata=bind_rows(workdata,workdata_mirror)

current_game_spread=-7.5
current_game_total=44
current_game_date=strptime("2024-02-11",format="%Y-%m-%d")
current_game_season=2023

radius=3
```

```
target_spread=-17.5
mean(sample$score-sample$opp_score+target_spread>0)

mean(sample$spread<current_game_spread)
mean(sample$spread==current_game_spread)
mean(sample$total<current_game_total)
mean(sample$total==current_game_total)
mean(sample$spread)
mean(sample$total)

#OUR 7.5/44 EXAMPLE

current_game_spread=-7.5
current_game_total=44
current_game_date=strptime("2024-02-11",format="%Y-%m-%d")
current_game_season=2023


parameters_halflife=5
parameters_target_sample_size=300

weightings=workdata %>%
  mutate(distance=sqrt((spread-current_game_spread)^2+.5*(total-
current_game_total)^2),

recency_weight=.5^(as.numeric(difftime(current_game_date,date_formatted,un
its="days"))/(365.25*parameters_halflife))*.5^(season<2015),
         custom_weight=2^(Playoff.Game.=="Y")

  )

fit_model=function (parameters) {
  tightness=parameters[1]
  boost_spread=parameters[2]
  boost_total=parameters[3]

  weightings<<-weightings %>%
    mutate(distance_weight=exp(-distance*tightness),

boost_weight=ifelse(weightings$spread<current_game_spread,boost_spread,1/b
oost_spread)*ifelse(weightings$total<current_game_total,boost_total,1/boo
```

```
    )
  effective_sample_size<<-
sum(weightings$total_weight)^2/(sum(weightings$total_weight^2))
  mean_spread<<-
sum(weightings$total_weight*weightings$spread)/sum(weightings$total_weight
)
  mean_total<<-
sum(weightings$total_weight*weightings$total)/sum(weightings$total_weight)

  return(abs(effective_sample_size-
parameters_target_sample_size)+1000*abs(mean_spread-
current_game_spread)+1000*abs(mean_total-current_game_total))
    }


k=optim(c(1,1,1),fit_model)
weights=weightings$total_weight

target_spread=-17.5
sum(weights*(weightings$score-
weightings$opp_score+target_spread>0))/sum(weights)

#THE SUPER BOWL!

current_game_spread=-2
current_game_total=47.5
current_game_date=strptime("2024-02-11",format="%Y-%m-%d")
current_game_season=2023


parameters_halflife=5
parameters_target_sample_size=1000

weightings=workdata %>%
  mutate(distance=sqrt((spread-current_game_spread)^2+.5*(total-
current_game_total)^2),

recency_weight=.5^(as.numeric(difftime(current_game_date,date_formatted,un
its="days"))/(365.25*parameters_halflife))*.5^(season<2015),
         custom_weight=2^(Playoff.Game.=="Y")
)
```

```
(weightings$opp_score %% 10)

sum_weights=sum(weightings$total_weight)

squares=weightings %>%
  group_by(squares_outcome) %>%
  summarize(prob=sum(total_weight)/sum_weights,fair_odds=1/prob)

write.csv(squares,"C:/Users/mbuch/Downloads/squares2024.csv")

write.csv(weightings,"C:/Users/mbuch/Downloads/weightings2024.csv")
```

PlusEVAnalytics February 2, 2024 Uncategorized

Leave a comment

This is Exhibit "B to the Affidavit of

Matthew Buchalter

Sworn before me, this 20th day of February, 2024

A Commissioner for taking Affidavits

Joseph Basaran

Player Support

Connecting players to the resources they need.

Have a dispute or a complaint?

iGaming Ontario encourages you to pursue any legitimate dispute or complaint you may have from your experience with internet gaming. Most disputes related to igaming will be resolved by following the customer dispute processes of the igaming site offered by a regulated Operator. While iGO cannot directly settle any bets, refund wagers or award compensation, players may escalate an unresolved or unsatisfactorily resolved dispute to iGO for review, after first attempting to resolve it with the regulated Operator if it relates to gambling products that are conducted and managed by iGO and offered by the Operator as agent of iGO (e.g. sports betting, casino, poker). In order to best determine what you should do about your issue, please use this tool to answer a few questions. If your dispute or complaint is related to an Operator that was formerly live in the regulated Ontario market and has since ceased operations in Ontario, please complete the questions to determine what steps need to be taken.

Are you concerned about your gambling?

Gambling is supposed to be fun. If it stops being fun, there are resources available that you can reach out to.

ConnexOntario — an organization that offers information and referral services focusing on mental health, addiction and problem gambling community services across the province. You can call, email or chat online 24 hours/7 days a week at 1-866-531-2600 or visit connexontario.ca

Which of the of the following best describes the nature of your issue?

Dispute with a specific igaming website

General complaint about igaming and its regulation in Ontario

Back to Start

Although some issues can be addressed directly by iGaming Ontario, most disputes related to igaming can be best resolved by contacting the customer service department of your regulated igaming site.

Complaints of this nature may include:

- Whether or not you have won
- How much you received as a payout
- The way your payments were managed
- Terms and conditions of an Operator or a specific game
- Bonus offers
- ID verification
- Closure of your account
- Decisions such as voiding or cancelling your bet, IT / technical issues with a site or a game (eg. site down, failure during a game)
- Customer service issues

This is Exhibit "C" to the Affidavit of

Matthew Buchalter

Sworn before me, this 20th day of February, 2024

A Commissioner for taking Affidavits

Joseph Basaran

iGaming Ontario's Complaints/Disputes Service Standards

Introduction

iGaming Ontario (iGO) has developed the following service standards so that complaints and disputes from the public are responded to in a transparent and fair manner.

What types of complaints/disputes/issues are covered?

These service standards apply to all complaints/disputes/issues from members of the public regarding:

1. Disagreement with a specific gambling business (Operator) website about the result of a gambling transaction or about the service received from them where
    a. the issue was first raised with the Operator through their complaints/customer service process as outlined in the Operator's terms and conditions for the site, and
    b. the issue relates to a gambling product that the Operator provides as an agent of iGO*, and
    c. the Operator did not respond in a timely manner (within 90 days of being made aware of a player dispute), or
    d. the Operator's response to the issue was not to the complainant's satisfaction
2. Issues with a previously regulated Operator who has ceased igaming activities in Ontario.
3. General complaint about igaming and its regulation in Ontario

iGO will respond to your complaint/dispute, make every effort to resolve it and explain the reasons for the decision reached. Please note that this process does not affect your right to raise your concerns with the Ombudsman of Ontario if you are dissatisfied with the results provided by iGO.

iGO Commitments

Timeliness

All complaints covered under these service standards will have their receipt acknowledged within 1 business day. If any further action is necessary, iGO will advise how long it will take to receive a further response.

Confidentiality

All complaints/disputes are kept confidential within the provisions of the Freedom of Information and Protection of Privacy Act. iGO will advise the internet gaming Operator who is the subject of a complaint/dispute in order for the complaint/dispute to be fully and fairly reviewed.

Reporting Back

If the issue cannot be resolved right away, the complainant will be informed as soon as the matter has been reviewed. In most cases, all concerned parties will be advised of the outcome of the review.

Note: If you have any questions regarding the Complaints/Disputes Service Standards, please submit an inquiry through igaming@igamingontario.ca or contact iGO Customer Service at (416) 326-8283 or 1-833-55-iGame / 1-833-554-4263 (toll free).

*Operators offering pari-mutuel wagering on horseraces do so as agents of Woodbine Entertainment Group.