But How Much Did You Lose? By Dan Abrams
Book Review: by Joseph Buchdahl

Judea Pearl, the renowned computer scientist and philosopher, has identified 3 levels of causal inference; that is thinking about "if I do this, what happens to that?" The lowest level is association or correlation, which many animals are capable of, for example a dog recognising the sound of a can opener and being fed. The second and more complex level involves intervention or causation with an awareness of cause-and-effect relationships. Many primates share this ability. The final level deals with causal modelling and specifically the realm of counterfactuals, that is to say things that would or could have happened if other things had been different. Arguably it is only humans that have attained this level of reasoning.

I'd like to propose a similar hierarchy for reasoning and understanding within the world of sports betting; I'll call it a Betting IQ. At the lowest level, we have the bettors who simply want winners, or want to be told how to find winners, or want to pay someone else to find them winners. Those with the lowest Betting IQ don't really care about anything else. A win is a win is a win, and that's all there is to it. For these bettors, odds and probability are but a minor sideshow, one largely to be disregarded and forgotten about, other than knowing that 10:1 will pay more than even-money.

Those on the next level, with higher Betting IQ, understand this reasoning is flawed. It's all very well winning, but if you don't properly take into account the length of the odds you are winning at, then you may end up not winning enough, the difference being handed to the bookmaker by means of their margin or vig. To avoid this pitfall, a bettor needs to adopt a more sophisticated and mathematical approach to dealing with odds and probability, one that takes them into the world of expected value (EV). Rather than counting winners, the EV bettor wants to know when they have bets where the odds the bookmaker has given them are longer than the true odds of them winning. In the short term, bad luck can mean fewer winners than hoped for, but the EV bettor doesn't, or at least shouldn't, care about that, because they know over the long run the law of large numbers will deliver them to the promised land of betting profitability. Bettors on this level are largely preoccupied by expected value. +EV = good; -EV = bad. The end.

In his book *But How Much Did You Lose?*, Dan Abrams, sports betting expert and former amateur poker player, takes readers to the final and highest level of Betting IQ. At this level we find the sharpest and most successful bettors who have grasped that finding EV is just one aspect to consider on the journey to become sustainably profitable. Not every bettor who finds EV will end up profitable and even those who are may not be maximising their profitability. As Dan says, "there are two ways to lose: betting on -EV plays and risking too much on +EV ones; but there's only one way to win [and] whenever

you score a big win, you should also ask yourself 'but how much did I lose?'" What's Dan on about? Welcome to the world of proportional bankroll staking and the Kelly criterion.

In a nutshell, belonging to the highest level of Betting IQ, and the subject matter of Dan's book, is about fully understanding the topic of bankroll management and staking in real world betting scenarios, not just theoretical ones, with a view to maximising not your expected value but rather your expected (bankroll) growth (EG). Indeed, somewhat counterintuitively, Dan shows us situations where giving up some EV is actually better for maximising EG, as well as scenarios where some of the bets you will place could even hold -EV.

Surely this is nonsense, right? It's not; Dan is correct, and his book is full of mathematics to prove it. Take a step back. To win money, you need to do two things: maximise your expected value AND minimise your variance. Variance is just a fancy statistical word for randomness or chance or simply natural variation. Good bettors know that the longer the odds are, the greater the variance will be. Toss a coin 10 times, count the heads and tails, and then repeat that 100 times. There'll be far less variance in the number of heads and tails in 10 coin tosses around the expected number of 5 heads/5 tails, than there will be for a similar scenario where you're counting the number of 6s in 10 rolls of a die. Why? Because the odds on the coin toss are shorter (1:1 as opposed to 5:1). Betting on shorter priced things, in other words things that are more likely to happen, displays less variance than betting on things that are less likely to happen. It's just a standard rule of probability.

To reduce variance, we can of course just bet on very short-priced events, but that will rule out a lot of betting opportunities we may be attracted to at longer odds, which may arguably hold more EV. Instead, Dan introduces us to the world of hedging or betting the other side. Common in financial investment, hedging is frequently used to either limit losses or lock in guaranteed profits by taking an opposite position to the initial investment. One example of hedging in betting is known as arbitrage, where, with the correct staking, backing all sides in a betting market can guarantee a small return no matter the outcome. Hedging, however, need not be solely restricted to sure-win scenarios. Where it's not, the effective odds for the full hedge bet are typically very short, even if the initial bet was at long odds, and hence the variance is hugely reduced.

The really ground-breaking material that Dan has produced in his book is to prove mathematically how hedging via the use of real Kelly criterion staking, where bets are not just placed one at a time but simultaneously instead, can be used to maximise your EG. Throughout the book, he relentlessly bangs the EG drum, reminding bettors that it is maximising EG and not EV that is the holy grail of a successful sports betting career. All sorts of hedging scenarios are considered, including ones for single wagers, multiple

wagers, double downs (betting again on the same outcome), odds boosts, free bets, middling, cashout, over-betting our initial wager and lots more besides. In many of these scenarios Dan rigorously goes through the mathematics of why it very often pays to hedge with a -EV bet as a means to maximise your overall EG.

A word of caution: this book is NOT for recreational bettors on the first rung of the Betting IQ ladder. Dan has a sixth sense for the topics he is dealing with in his book, and evidently sees very clearly what it is that he is trying to say, whilst others may need to make more effort to understand and appreciate his vision. You must be prepared for a lot of equations, and you should have a sound understanding of and familiarity with proportional bankroll money management and the Kelly criterion. If your motivation is simply to have a bit of fun with your betting just by finding some winners, you will very probably give up before the end of the first chapter, and certainly by the time Dan does a bit of calculus. I say this here so as not to waste your time, and I'm sure Dan does not want to waste your time either.

However, if you are already on the second rung and have aspirations to take your betting profitability more seriously, and are prepared to give this book the attention and focus it deserves – arguably it may require several readings to fully digest its message and means of delivery – then hopefully this book will find a permanent place on your shelf. Indeed, even those bettors on the highest level of Betting IQ should appreciate the diligent and concise way that Dan has packaged the topic of expected growth via Kelly betting and hedging to help them think more clearly about things they may have already been doing intuitively.

The caveats above notwithstanding, I believe this book is potentially a masterpiece of thought. 250 years ago, Daniel Bernoulli, the legendary Swiss mathematician, developed his logarithmic utility function where the wealthier one becomes, the less value one attaches to each new incremental gain. In the 20th century, the Bell Labs scientist John Kelly Jr. showed how you should risk your existing wealth to achieve this kind of wealth growth for probabilistic wagering or uncertain investment opportunities. But Kelly only considered single isolated wagers, and that's not how most betting takes place in the real world. As Dan reminds us, Albert Einstein once said: "In theory, theory and practice are the same; in practice, they are not."

Dan has brought all this work together to create not just some theoretical framework, but a practical real-world roadmap to refocus a bettor's attention away from expected value and towards minimising variance and maximising expected growth by means of the strategy of hedging. Recreationalists aside, the primary aim of sports betting is to win money, and Dan's book will show you the best way to manage your existing money to win more of it. It may take some time for the book's true potential to be recognised

amongst the sharp betting world but when it happens, in time it may be regarded as ground-breaking.