BitChamps: Perpetual Sports Markets

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Abstract. Prediction markets and sportsbooks enable speculation on game results but are confined to specific events. Lacking maturity dates, BitChamps tokens represent views on the win potential of teams in perpetuity, facilitating long-term speculation. League Pool distributions triggered by game results are an anchoring mechanism for ensuring the relative prices of tokens reflect projected win potential under a no arbitrage assumption. A 10% tax applies to all token swaps, funding the league pool from which those distributions are made.

1. Introduction

In 1993, Robert J. Shiller introduced a form of perpetual claims on cash flows periodically settled between longs and shorts, to be tied to indices of dividends or rents. Such markets, he envisioned, could *help measure the price of assets generating dividends or rents even when the underlying asset prices are difficult or impossible to measure directly* (Shiller 1993). Markets identified in his proposal included:

Asset (Difficult to Price)	Measurable Rent/Dividend
Human Capital	Wages
Commercial Real Estate	Rent

It was not until 2016, when Arthur Hayes launched the XBTUSD perpetual swap on BitMEX, that perps found product-market fit. The price of the underlying asset (XBT) was easily measured, so it wasn't a measurement problem that perps addressed. Instead, it was the lack of a maturity date in perps contracts that proved valuable for two reasons (Ackerer, Huggonnier, and Jermann 2024):

➢ *Traders can take positions for the duration of their choice without having to rollover from maturing contracts to newly minted contracts, thus tremendously simplifying the investment process*
➢ *The fact that a single contract is traded on each underlying asset fosters a higher liquidity which in turn facilitates price discovery*

A general appetite for speculating on sporting events is evidenced by the proliferation of sports gambling and prediction markets, but like vanilla futures, these contracts are bets on specific events or points in time. In lacking maturity dates, BitChamps tokens afford the same benefits as crypto perps of eliminating rollover requirements and fostering greater liquidity. In a steady state with non-zero volume, BitChamps tokens benefit from team wins in perpetuity.

2. The League Pool

BitChamps tokens help price sports teams as win-generating assets. Team franchises might be privately owned or publicly held (ex. MANU, Green Bay Packers), but only in their capacity as business entities. BitChamps focuses on stripping away all business considerations and pricing projected wins, which is the primary interest of fans. Applying Shiller's framework, the price measurement problem is:

Asset (Difficult to Price)	Measurable Rent/Dividend
Team	Wins

Entitling tokens to cash distributions triggered by wins helps price each team as a win-generating entity. The "league pool" is an indirect mechanism for cash settling wins between holders of team tokens. All token swaps are subject to a 10% tax enforced by a Uniswap v4 hook. 9% is directed to the league pool funded by all tokens belonging to the league and 1% is directed to the BitChamps treasury.

A portion of the league pool is used to buyback and burn winning team tokens at the completion of each game, and the portion varies with the significance of the game (regular season vs. playoffs). These win-driven distributions more quickly redistribute the league pool to winning teams than to losing teams. Section 3 derives fair value relative pricing of tokens consistent with their win potential.

3. Fair Value Pricing

The fair value of an equity can be expressed as the sum of estimated free cash flows:

$$V = \sum_{t=1}^{\infty} CF^e_t * DF_t$$

V = The company's equity value
CF^e_t = Estimated free cash flow for year t
DF_t = Discount factor for year t
t = Year

Then, for a BitChamps token, the fair value of the token can be represented as the sum of estimated league pool distributions (LPD):

$$V = \sum \text{ from } g = 1 \text{ to } \infty \; LPD^e{}_g * DF_g$$

V = The token's market cap
$LPD^e{}_g$ = Estimated League pool distribution
DF_g = Discount Factor for game g
g = game

Per the league pool contract, distribution LPD = size of the league pool * payout percentage. $LPD^e{}_g$ can therefore be represented as a function of the size of the league pool, the payout percentage, and the likelihood of victory

$$LPD^e{}_g = S_g * P_g * L_g$$

S_g = Size of the league pool at the time of game g
P_g = League pool payout percentage for game g
L_g = Likelihood of winning game g

Substituting into our fair value equation:

$$V = \sum \text{ from } g = 1 \text{ to } \infty \; S_g * P_g * L_g * DF_g$$

Consider two teams, Team A and Team B, where Team A is 1.2x as likely to win each game as Team B in perpetuity. For tokens mapped to those teams, $L_g(A) = 1.2*L_g(B)$. Then by the summation above, the fair value of token A, $V(A) = 1.2*V(B)$. In other words, the tokens of team A, which is 20% better than team B, are fairly priced at a 20% higher valuation.

4. League Pool Size and Volatility

S_g is most difficult to forecast and likely most impactful on V. The size of the league pool depends on trading activity; if nobody trades BitChamps tokens, the pool will approach 0. In this regard, BitChamps tokens are no different from other speculative tokens such as bitcoin or memecoins. However, there are external drivers of volatility that aid persistence of the league pool, and pair trading against an index could isolate the idiosyncratic element L_g of a token.

Given the 10% tax on swaps, short term factors such as match opponent or 2-4 week injuries are unlikely to sufficiently impact $\sum L_g$ to motivate buying or selling of tokens. Prediction markets and sports betting are better suited for speculating on the impact of short-term factors. But to the extent that the outlook for teams' win probabilities over the season or seasons ahead adjust significantly, traders will swap tokens until they more closely align with relative fair value under a no arbitrage assumption, generating taxes for the league pool in the process. Potential external drivers of such volatility may include player transfers, coaching changes, and win streaks. Importantly, such drivers of volatility are uncorrelated with S_g, suggesting trading activity, and thus league pool distributions, could continue even if the memecoin element plateaus.

To speculate strictly on L_g there must be an index token to pair trade against. Within BitChamps token smart contracts, there is whitelist functionality for tax free transfers. This enables creation of an index token contract with tax-free minting and redemption in exchange for all tokens constituting the league. If shorting the index token is possible, then the idiosyncratic team element may be isolated by shorting the index and longing a team token.

5. Conclusion

BitChamps tokens may be characterized as unique iterations on existing instruments. They are tax tokens with redistribution dictated by game results. They are perpetual prediction markets with a memecoin element. They are like perpetual swaps tracking the price of teams as win-generating entities with indirect cash settlements between winners and losers, rather than shorts and longs, at the conclusion of each game.

Regardless of the characterization, redistributions from the league pool enforce relative pricing under an efficient markets assumption, and onchain trading is critical to its sustainability. External factors help drive volatility, but organic interest and speculation are required for long-term sustainability, else external volatility drivers simply prolong longevity of the pools.

Under the assumption of sustained trading activity, BitChamps tokens are a novel representation of the win potential of a team in perpetuity. BitChamps might appeal to loyal fans or traders who would like to speculate on the long-term prospects of a team.

References

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