Funding Rate Arbitrage

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Contents

1 Overarching Plan

Developing an effective funding rate arbitrage strategy requires a structured methodological approach. We begin by thoroughly understanding funding rate mechanics in perpetual futures markets, examining how they function across different exchanges. This enables us to identify market inefficiencies that can be systematically exploited.

With this knowledge established, we formulate specific research questions to investigate funding rate differentials and their patterns. These questions guide our data collection process and shape the framework we use to evaluate potential trading opportunities.

2 Funding Rate Mechanics

Funding rates are what keeps perpetual futures aligned to their underlying spot price. These perpetual futures contracts, native to cryptomarkets, have no expiration date unlike traditional futures. In traditional futures, the contract converges to the underlying spot price as time approaches maturity, but since perpetuals have no maturity date, a mechanism is needed to assure the contract does not drift too far from the spot price. This is the purpose of the funding rate.

The funding rate acts as a periodic payment between longs and shorts in the perpetual futures market. The purpose is to incentivize traders to take on position's that align the perpetual price with the underlying spot price. If the contract is trading at a premium to the spot, the funding rate becomes positive, leading to traders holding a long position having to pay traders holding a short position. Conversely, if the contract is trading at a discount, the funding rate becomes negative and short position holders are required to pay long position holders.

The funding rate discourages imbalance in positions and ensures that the perpetual futures price does not diverge too far away from the underlying spot price.

2.1 Binance Funding Mechanism

Binance computes its funding rate by taking a time-weighted average of a premium index P and combining that with a baseline interest rate r. Over each funding interval, 8 or 4 hours on Binance, a impact bid price and a impact ask price is sampled across the order book. These snapshots measure price at which 200 USDT worth of margin, known as the impact margin notional, can be executed on both sides. That is, every 5 seconds Binance measures both the bid and ask side of the order book to compute the average fill price if you were to trade an order worth 200 USDT. It quantifies the depth of the orderbook and the price impact such a trade would have. The index price I, of the underlying spot market is then compared against these impact prices to determine the average premium

$$P_{\text{Binance}} = \frac{\max\{0,\ \text{Bid\_Impact} - I\} - \max\{0,\ I - \text{Ask\_Impact}\}}{I}. \tag{1}$$

Binance samples this premium index P every 5 seconds, then takes a time-weighted average over the full funding interval, which is 8- or 4 hours. The final funding rate F at settlement is

$$F = P_{\text{Binance}} \ + \ \text{clamp}(r - P_{\text{Binance}},\ -0.05\%,\ 0.05\%), \tag{2}$$

where the clamp function forces interest rate and premium difference, $r - P$ to remain between $\pm 0.05\%$. In most cases r is a fixed daily percentage, like 0.01% per 8 or 4 hours, but this does not apply to some contracts for which the interest rate $r = 0\%$.

Further, for some contracts Binance limits the funding rate to stay within pre-defined boundaries. For lower leverage contracts, the funding rate will never exceed $\pm 3\%$. For higher leveraged contracts, the limit is set relative to the contract's maintenance margin ratio, which is the minimum percentage of a position's notional value that must be held as margin to avoid liquidation. The funding rate cannot cross ± 0.75 times this ratio.

Having a position open the moment of funding completely determines whether we pay of receive. Binance also enforces a short delay here, by up to 1 minute, around the settlement time. All information is taken from [1].

2.2 ByBit Funding Mechanism

ByBit uses a methodology very similar to that of Binance, using on a time-weighted average of a premium index P along with a baseline interest rate. In fact, the premium index on ByBit is computed in essentially the same way as in (1), where the impact prices for bid and ask are determined by simulating a trade of the impact margin notional. However, ByBit samples this data every minute instead of every 5 seconds that Binance does, and then applies a linear time weighting over all the minutes in the interval, putting more weight to later observations. The average premium index on ByBit is given by

$$P_{\text{ByBit}} = \frac{\sum_{t=1}^{480} p_t \cdot t}{\sum_{t=1}^{480} t},$$

where 480 comes from 60×8: one minute averages over 8 hours, and p_t is the minute premium indexes at minutes t. Likewise, ByBit's final funding rate formula follows the same structure as in (2)

$$F = P_{\text{ByBit}} \; + \; \text{clamp}(r - P_{\text{ByBit}}, \; -0.05\%, \; 0.05\%),$$

with an interest rate r that is often quoted as 0.03% per day, that is 0.01% per 8 hours for most trading pairs, although r may be set to 0% for certain pairs, similar to Binance. ByBit also enforces a funding rate limit tied to margin parameters to prevent extreme funding charges, similar to the bounds Binance imposes.

An additional difference is that ByBit may temporarily adjust the upper and lower limits of the funding rate, and sometimes the time interval itself, under extreme volatility. Further, while Binance enforces a short delay of about 1 minute around the settlement time, ByBit's delay is typically only a few seconds, extending at most to 5 seconds, meaning orders opened or closed within that window may still be counted for that funding settlement. All information is taken from [2, 3, 4].

2.3 OKX Funding Mechanism

OKX also employs a time-weighted premium index combined with an interest rate, very similar to the formulas in (1) and (2). Historically, OKX used an method where the interest rate was set to 0 and the premium index was averaged directly. Now, under its new calculation, OKX follows the same clamp approach. However, we will assume the old model since we will look at historical data for the strategy. Older OKX perpetual contracts had an interest rate of 0%, but newer contracts now typically adopt 0.03% per day, split proportionally across each settlement period.

The old model used equal weight in time average like so:

$$F = \text{clamp}(\text{MA}(P_{\text{OKX}} - r), \; F^{\text{Cap}}, \; F^{\text{Floor}}).$$

Here MA means moving average, the interest rate $r = 0\%$ and the premium index P_{OKX} used the mid price m and the index price of the underlying spot asset to compute

$$P_t = \frac{m - I}{I}, \quad \text{where } m = \frac{Ask_1 + Bid_1}{2}.$$

Then the time-average for 8 hours becomes

$$P_{\text{OKX}} = \frac{1}{480} \sum_{t=1}^{480} P_t.$$

As with Binance and ByBit, maintaining a position at the exact funding timestamp decides whether we pay or receive the fee, and there can be a brief delay, up to milliseconds or around a minute, during actual collection. All information is taken from [5].

3 Research Framework

Now that we know how funding rates work and how they differ based on the exchange we are trading on, some interesting questions and ideas have formed.

- Do significant funding rate differentials form between the exchanges? If so, under what market conditions?

- Does open interest affect funding rates? What about open interest volatility and funding rate volatility?
- Under what conditions does a multi-exchange arbitrage outperform one posed on a single-exchange?
- How big is the effect of fees on the profitablity of the strategy?
- How would we optimally execute both legs of the arbitrage?
- What leverage and margin is best for balancing capital efficiency with liquidation risk?

From what we have gathered now, the funding payment is determined precisely at the settlement snapshot. If we have position in the favourable funding direction at that exact moment, we receive the payment for the interval. That payment is usually computed as

$$\text{Funding Fee} = \text{Notional Position Value} \times \text{Funding Rate at Settlement}$$

and is what we aim to collect. Therefore, rather than holding a positon for the entire 8-hour funding period, we can open the position as close to settlement as possible, hedge on the other venue to offset directional risk, and close the position immediately after collecting the payment. The negatives of this is transaction costs.

3.1 Strategy Hypothesis

First, what we want to do is to inspect which pairs would actually be profitable. We will do a multi-exchange arbitrage strategy, perpetual to perpetual. The advantage of this is that we can use leverage on both legs and the funding differentials may be larger between venues. Also, our capital will be more diversified which can be beneficial in the rare event of an exchange meltdown.

On the contrary, this introduces some additional complexity. Execution is more complicated because orders must be managed on different vanues with different APIs and data feeds. This can lead to latency issues, where delays or discrepancies between exchanges may result in execution mismatches. Further, managing risk across multiple exchanges is more challenging compared to in-exchange arbitrage, where we could use a unified margin account. In contrast, in-exchange arbitrage offers simpler execution and consolidated risk management, though it may not provide the same level of leverage or capture as large funding differentials across venues.

What we will do is to make on the exhange where there is a bit less liquidity, and once that leg has executed, we will immediately take on the other exchange to remanin delta-neutral. Preferrably, we trade as little as possible to pay as little transaction costs as possible. So if we can hold for multiple funding periods, that would be ideal. In order to see how to profit, we will need to compute break-even points. We want to inspect the orderbook to see how big a trade we can actually execute. This should be conditioned on the exchange we will take on, since this where we will assume to have most impact. So if the orderbook shows that we can comfortably size, say 25 units, then we will start quoting limit orders of 25 units on the exchange we are making on, and change this dynamically based on how much we can take.

4 Empirical Analysis

We managed to obtain funding rate data from Binance and OKX. It was not as straighforward to fetch this from ByBit, which is why we proceed with analyzing a cross-exchange arbitrage between Binance and OKX. To begin, we fetch data for BTC/USDT, ETH/USDT, XRP/USDT, SOL/USDT, ADA/USDT, AVAX/USDT, LTC/USDT and BNB/USDT. We align the data between Binance and OKX, compute the funding differential Δ_F between the two exchanges, and rank the pairs based on their mean absolute differential.

Symbol	Mean $|\Delta_F|$	STD$|\Delta_F|$	Max$|\Delta_F|$
AVAX/USDT	1.044	0.919	12.853
BNB/USDT	0.882	1.043	8.766
XRP/USDT	0.853	0.682	3.694
ADA/USDT	0.850	0.779	5.697
SOL/USDT	0.782	0.819	12.270
LTC/USDT	0.696	0.612	4.085
BTC/USDT	0.673	0.693	7.234
ETH/USDT	0.642	0.629	8.601

Table 1: Summary statistics of absolute differences per symbol, in descending order of Mean$|\Delta_F|$.

We see the top pairs here are AVAX/USDT, BNB/USDT and XRP/USDT. We proceed with analyzing BNB/USDT. This is just for exploration though. In the actual strategy we will take positions in multiple pairs if the differential is attractive enough.

4.1 Profitability Threshold Analysis

What we first want to examine is break-even points, the minimum threshold at where our profit covers the costs of trading. For our case, we say that break-even is reached when the total funding payment equals the costs for entering and exiting a trade [6].

Let f denote the trading fees and Q the position size. Then the round-trip transaction cost can be written as

$$T_{\text{cost}} = 2fQ,$$

with the factor of 2 accounting for both the entry and exit fees. This is of course a simplifications since fees vary with liquidity and execution urgency. However, this gives a useful approximation.

The expected profit for each funding interval is given by

$$\text{Profit} = |\Delta_F|Q,$$

where $|\Delta_F|$ is the absolute funding rate differential between the two exchanges. Setting the profit over n intervals equal to the transaction cost yields

$$2fQ = |\Delta_F|Qn,$$

where we can cancel the positions sizes Q from both sides, and get that the number of intervals needed to break even is

$$n = \frac{2f}{|\Delta_F|}.$$

Here we see that a smaller absolute funding differential requires more intervals to cover costs, while a larger differential leads to break-even much faster. We also see that as the transaction fees become more and more favourable, we break even faster.

Looking at fee tiers on both OKX and Binance really gives us a grasp of the impact fees have on the strategy.

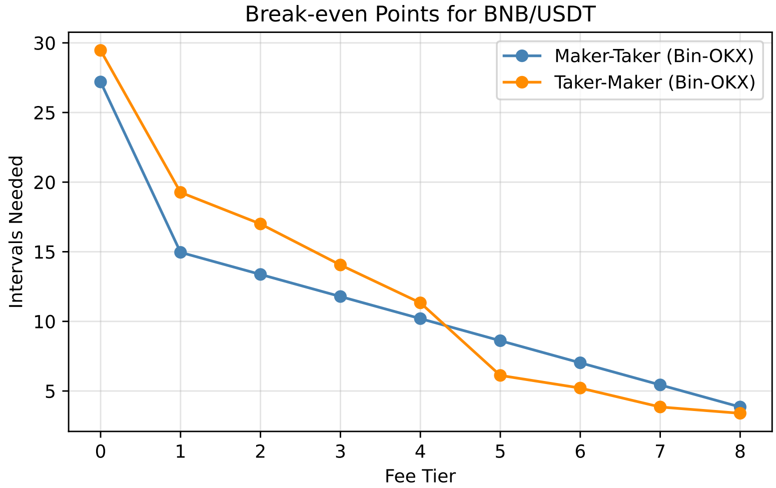

Figure 1: Funding intervals required for break-even at different fee tiers. We note that it is cheaper to make on OKX because of their negative maker fees at higher levels. We compute these break-even points using the average observed absolute funding differential.

As shown in Figure 1, traders with regular fee tiers may need upwards of 30 consecutive funding intervals, just to break even. On the other hand, those with premium fee tiers can hit profitability close to 10 times faster, a dramatic opportunity boost. Based on this clear advantage, we will assume access to optimal fee tiers going forward. Without this benefit, we would choose different pairs and venues to hopefully find much larger funding differentials to compensate. Important to note is that these break-even points in Figure 1 are computed at the mean absolute funding differential, and we would not trade on the mean, we would trade above the mean. This is just to illustrate the importance of favourable exchange fees.

Also, we take advantage of OKX's negative maker fees at higher tiers by making the OKX leg while taking on the Binance leg. This sets a clear rule, which is that we only open positions when the expected funding differential clearly outweighs our fees.

4.2 Differential Determinants

Next, we take a look at open interest data. Open interest is the total number of outstanding derivative contracts that remain open in the market. That is, not yet settled or closed. Therefore, increasing open interest suggest fresh money entering the market, with new longs and shorts opening more positions, while decreasing open interest indicates closing of positions.

We obtained open interest data from Binance. Unfortunately, similar data was not readily available from OKX, so we will assume that the open interests on Binance and OKX are highly correlated.

To further analyze the strategy's execution, it is essential to look at the orderbooks on both exchanges. To that end, we take a snapshot of the current orderbooks for BNB/USDT on Binance and OKX, and use this as a representative state of liquidity in our analysis.

These are, of course, significant simplifications and assumptions. Ideally, we would work with granular orderbook data, especially around settlement times when we want to enter/ exit positions, to better capture market behavior. However, for now, we will have to do with this.

4.2.1 Signal Construction and Feature Engineering

Now we want to look for more features that describe why and how funding rate differentials occur. We want to see under what market conditions we should prepare to enter. This gives us insight into how to size our trades, when to exploit even more, and when to sit back and wait.

We create features of sum of open interest during the entire period running up to the next settlement, we look at a 3-period rolling volatility of open interest. That is, standard deviation of the open interest. We also look at pre-settlement open interest. The intuition is that traders might adjust their positions during the 60 minutes before the settlement payments. If many close positions to avoid fees, funding rates might stabilize, but if they open new positions to profit, rate differences might grow.

Initially, we find that only the previous funding differential correlates moderately with the next funding differential. The rest of the features show very little correlation with the next funding period. Therefore, we have to look at some more interesting interaction features instead.

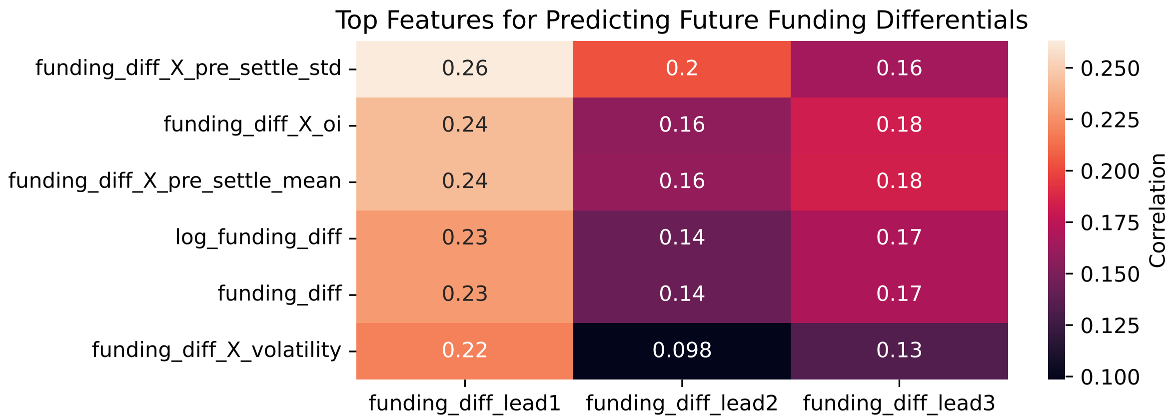

Figure 2: Top 6 features based on their correlation with the next funding differential (first column). We see that the interaction terms of Δ_F together with open interest and the Δ_F together with open interest volatility shows moderate correlation with the next funding rate differential Δ_F.

We see better correlation now between open interest and funding differentials. These correlations are not huge, but are still directionally useful. This suggests that funding inefficiencies are most exploitable when they occur in markets with substantial open interest. Therefore, we should scale position size with both funding differentials and open interest. Like $\mathrm{Q} \propto Q_{\mathrm{Base}} \cdot \{\Delta_F \times \mathrm{OI}\}$.

Further, the somewhat reasonable correlation of $\Delta_F \times \sigma_{\mathrm{OI}}$ indicates that the speed of open interest affects how funding differentials persist. Therefore, our strategy should incorporate volatility in open interest as a considering factor, and the strategy might benefit from regime-based rules that adapt to volatility levels.

Further inspecting the distribution of the signal in the plot below

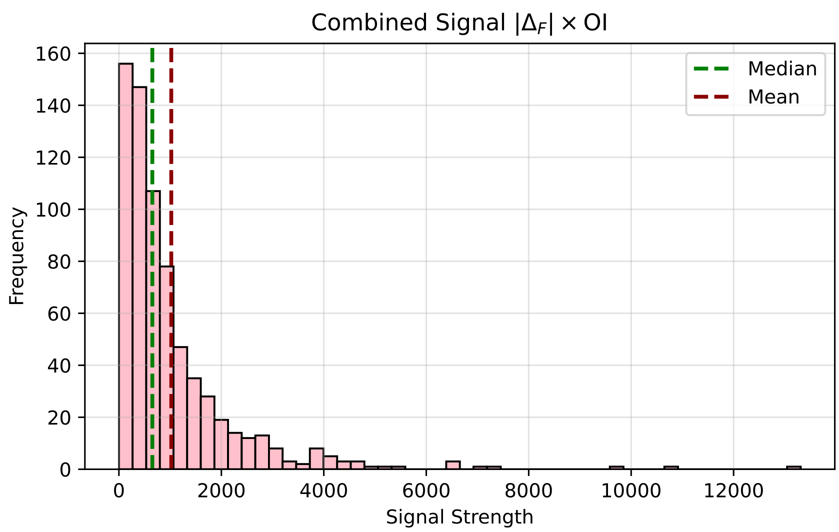

Figure 3: Strength of the combined signal with funding differential and open interest. The mean is 1022 in dashed red and the median is 652 in dashed green.

we note that a signal at the median, at 652, represents a typical opportunity, while a signal of the 75'th percentile, about 1300, represents a strong opportunity. We see significant skew, suggesting occasional extreme opportunities that we should capitalize on. We should also normalize against the median instead of the mean for more stable position sizing. The normalized signal is therefore $\mathcal{S} = \frac{\Delta_F \times \mathrm{OI}}{\mathrm{Med}\{\Delta_F \times \mathrm{OI}\}}$.

Now we can refine our strategy layout some more. We scale positions according to the normalized combined signal

$$Q \propto Q_{\mathrm{Base}} \cdot \mathcal{S} \cdot \sigma_{\mathrm{OI}} \cdot \mathcal{F}_{\mathrm{Tier}}.$$

Further, we only enter trades when we have covered some multiple of the break-even threshold. We have also introduced $\mathcal{F}_{\mathrm{Tier}}$ here, a fee tier multiplier, which aggressively scales the poisiton with a better fee tier.

The position sizing begins with a base position size Q_{Base} derived from the account equity, which is then adjusted according to signal strength. For instance, when the signal is particularly strong, a baseline position of $10k might be scaled up to $15k in high-confidence opportunities. We further adapt position sizes based on market volatility conditions. In calm markets, we slightly reduce exposure to avoid overcrowded trades. In moderate volatility, we maintain the boosted size as volatility may extend profit opportunities. In high volatility regimes, we drastically cut exposure to protect against sudden reversals and liquidation risks.

Let's see a toy example of how we would size a position with a $100k account:

Funding Differential:	2.0 bps
Sum of Open Interest:	13,567,016
Volatility:	0.90
Signal Strength:	2713.40
Signal Ratio:	4.18× median
Fee Tier:	Best (multiplier: 8.67×)
Position Size: $10,000	

We cap position sizes at 10% of our account capital, had we not done this we would have traded at a size of $Q = \$36,067$ which may be outside of our risk apetite.

4.3 Execution Analysis

Next, we look at how our trades would execute and measure the price impact. We analyze order book snapshots from both exchanges and compute the slippage by simulating the execution of a given order size. In our approach, we iterate over the order book levels, accumulate volume until the given order size is met. For each level, we compute a volume-weighted average price and compare it to the mid price. The relative difference, expressed in basis points, represents the price impact, the slippage, for that order size.

The table below shows what happens when we try to trade different amounts of BNB.

Size (BNB)	Binance Slippage (bps)	OKX Slippage (bps)	Total Value ($)
5	0.0803	0.8020	6232.5500
10	0.0803	1.1549	12465.3200
15	0.1059	1.5719	18698.3460
20	0.1396	1.7804	24931.3460
50	0.2266	3.3791	62333.0777

Table 2: Price impact when trading different sizes. OKX has significantly larger slippage than Binance.

Our execution analysis confirms our original approach: make on OKX and take on Binance. This is optimal as OKX shows significantly higher market impact, meaning we should avoid taking there if possible. By placing limit orders on OKX, we can gradually build our position without causing adverse price movements, while immediately reacting to each fill with a corresponding market order on Binance.

We also see that we should keep order chunks at around 10-15 BNB which corresponds to $12k - $18k positional value, where execution impacts are still manageable.

For example, if we want to trade $15,000 worth of BNB, which is 24.08 BNB at $623 each:

- Split into 5 BNB chunks: [5, 5, 5, 5, 4.08].
- Place limit order on OKX for 5 BNB.
- When filled, immediately take 5 BNB on Binance.
- Repeat until full position is built.

4.4 Convergence Analysis

To determine optimal position durations, we analyze how quickly funding rate differentials converge between exchanges. We denote convergence as complete when the differential crosses zero or changes sign, indicating the opportunity has disappeared. For each potential entry point in our historical data, we look ahead up to 20 funding periods to find when this convergence first occurs. By incorporating the best exchange fees, 0.0120% for the round-trip, with measured execution impact costs at 0.11 bps, we establish a break-even threshold of 2.61 bps needed to overcome trading costs.

The distribution of convergence times show rapid mean reversion characteristics, while the median convergence occurs in just 1 period, the mean of 2.12 periods indicates occasional longer divergences. This right-skewed distribution, shown in Figure 4, suggests most opportunities resolve quickly. Of 653 observed convergence events, 76% resolved within 2 periods.

Looking at examples of testing real-world differentials, we see that for

- **<3 bps** differentials prove unprofitable, requiring 2.61+ periods to break even, exceeding typical convergence times.
- **∼3 bps** offers marginal profitability, $0.04/$1000 if exited at median convergence, but carries risk if held longer.
- **∼7 bps** provides great profitability $0.44/$1000 with 0.37-period breakeven.

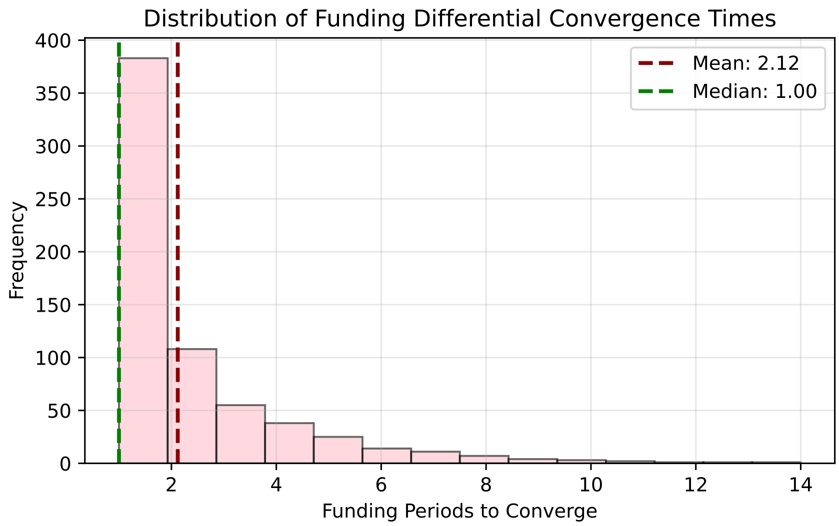

Figure 4: Empirical distribution of convergence times for BNB/USDT funding differentials, demonstrating rapid median reversion of 1 period despite occasional extended divergences.

This recommends avoiding sub-3 bps opportunities, treat 3-5 bps as time-sensitive trades requiring next period exits, and consider >5 bps differentials as high confidence opportunities. The rapid reversion suggests we should emphasize speed rather than hoping for extended divergences.

5 Risk Management Framework

Our risk management system balances profit potential with capital protection through leverage scaling, safety buffers, and position allocation.

For leverage adjustment, we scale exposure responsively to market conditions. Under calm markets with low volatility, we deploy up to 7x leverage for greater returns. During normal volatility periods, we reduce leverage to 5x, while turbulent markets require a more conservative 3x cap. This intensifies when opportunities strengthen in that larger funding differentials, opportunities >5 bps, permit proportional leverage increases within each volatility tier.

We maintain 300% of exchange minimum margin requirements. We also use a safety buffer:

- Buffer at 70%: reduce positions by 20%.
- Buffer at 85%: reduce positions by 50%
- Buffer at 95%: Full reduction to avoid liquidation.

We will move extra profit between exchanges as needed. When one leg trade is profitable, we can transfer some of that profit to support the losing leg, giving additional margin buffer where it is most needed.

A balanced portfolio construction is also good for risk management. We spread our trades across different coin pairs rather than putting everything in one trade. No single pair will get more than 20% of our total account.

6 Final Strategy

The core of our strategy revolves around the signal that combines funding rate differentials with open interest.

6.1 Signal Generation and Entry Criteria

1. **Combined Signal** $\Delta_F \times \mathrm{OI}$
   - Normalize against the median strength for the signal ratio $\mathcal{S} = \frac{\Delta_F \times \mathrm{OI}}{\mathrm{Median}\{\Delta_F \times \mathrm{OI}\}}$.
   - Values at 2x median represent strong opportunities.
   - Values at 0.5x median represent weak opportunities.
2. **Entry Threshold** We only enter positions when
   - Funding differential exceeds 2x our break-even threshold.
   - This is somewhat arbitrary but ensures profit-margin on each trade.
3. **Exchange Direction**
   - When Exchange1 rate > Exchange2 rate: short on 1 and long on 2.
   - When Exchange1 rate < Exchange2 rate: long on 1 and short on 2.
   - This always maintains delta-neutral exposure.
4. **Pair Selection**
   - Primarily focus on top pairs by their funding differential magnitude.
   - Look at top 20 pairs in terms of liquidity for greater opportunity.
   - Include top 5 exchanges in terms of liquidity for greater opportunity.

6.2 Position Sizing

We compute the position size dynamically using multiple factors:

$$Q = Q_{\mathrm{Base}} \times \mathcal{S} \times \sigma_{\mathrm{OI}} \times \mathcal{F}_{\mathrm{Tier}}.$$

Here

- The base size Q_{Base} is account equity $\times$ risk factor (% per unit of signal ratio)
- The signal ratio $\mathcal{S}$ is current signal / median signal.
- The open interest volatility σ_{OI} adjusts size based on volatility regimes.

- The fee tier multiplier $\mathcal{F}_{\text{Tier}}$ scales aggressively with better fee tiers, up to 8.67x for the best.
- Maximum position is capped at 10% of account equity per pair.

6.3 Execution Method

1. **Exchange Roles**
    - Make on the exchange with the highest order impact/ slippage.
    - Take on the exchange with the lower impact immediately by placing market orders.
2. **Order Chunking**
    - Break larger order into manageable sizes relative to slippage tolerance.
    - We minimize slippage and execute fast enough.
3. **Timing**
    - Begin quoting around 30min before funding settlement.

6.4 Exit Criteria

1. **Standard Exit**
    - Close positions after one funding payment.
    - This aligns with the median convergence time of one period.
2. **Adaptive Holding Time**
    - For 3-5bps differentials, exit after one funding payment.
    - For differentials $>$ 7bps, considering holding longer if conditions remain favourable.
    - For $<$ 3bps, do not enter in the first place.
3. **Exit Execution**
    - Unload in the same manner as we entered the position in.

6.5 Risk Management

1. **Dynamic Leverage**
    - Low volatility markets: up to 7x leverage.
    - Normal Volatility: up to 5x leverage.
    - High Volatility: maximum of 3x leverage.
2. **Safety Buffers** Maintain a 300% exchange minimum margin requirement.
    - At 70% buffer depletion: 20% position reduction
    - At 85% buffer depletion: 50% position reduction
    - At 95% buffer depletion: close all positions.
3. **Portfolio Construction**
    - Diversify accross multiple pairs.

6.6 Parameter Calibration

- Median $\{\Delta_F \times \text{OI}\}$ recalibrated monthly using a 3 month rolling window.
- Volatility percentiles updated weekly using a 3 month rolling window.
- Entry criteria recalculated weekly from the most recent 1 month of execution data.

7 Limitations and Future Work

The current strategy is based on several assumptions that work for a proof-of-concept but will definitely need adjustments as market conditions change. We assume a stable relationship between open interest and funding rate differences across exchanges, but in times of market stress or regime shifts, this may no longer be true. Also, the model uses the best maker and taker fees, and any changes in fee structures would require us to update our break-evens. Our approach also relies on one single orderbook snapshot from each exchange to estimate liquidity and price impact. This was of course for simple exploration, but we would really need granular orderbook updates to get a good view of market liquidity.

Looking ahead, there are clear areas for improvement. One is dynamic parameter optimization, which would allow us to update entry thresholds and fee multipliers using live and historical data. In a live trading, we would listen to websocket feeds to get live market data for monitoring funding rates and orderbooks accurately. Improved error handling is also important. For example addressing partial fills, order mismatches, and any connectivity problems.

Incorporating predictive models to forecast funding rate movements could improve our trading signals. Finally, a rigorous backtesting and simulation framework with a good amount of historical data and Monte Carlo simulations would allow us to test the strategy under various market scenarios.

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