sixtant

A brand of M3 Capital Management SAPI de CV

TECHNICAL OVERVIEW

We apply **quantitative trading** strategies to cryptocurrency markets in pursuit of alpha exposure, which comes from correcting **microstructure inefficiencies & mispricing**. This means data-driven arbitrage, market making, and mean reversion trading strategies whose returns are not dependent on the performance of the market (beta exposure).

- **Strategies:** market-neutral arbitrage, market making, and mean reversion.
- **Tech stack & architecture:** embedded Clojure DSL for algorithmic order execution and declarative trading strategy definition on top of a system that keeps real-time order book state and reacts to changes within milliseconds.
- **Profit & loss:** Annual returns before taxes of 18.45% and 33.80% from prop trading in 2018 and 2019, respectively, with optimistic growth potential as we expand operations, use market data to tweak strategies and create new ones, and overall market volume increases.

Strategies

Arbitrage is the capture of risk-free profits via the simultaneous sale and purchase of the same asset at different prices. There consistently exist arbitrage opportunities (yielding ~0.05-0.25% per trade) between cryptocurrency exchanges. We capture these opportunities as soon as they appear (our system processes changes to the limit order book and identifies opportunities with latency on the order of **1 millisecond**), and are able to do so across markets whose prices quote in foreign currencies thanks to our banking relationships and currency hedging algos.

Market making is the process of offering liquidity on a market to buy/sell at a limit price. Market makers weigh inventory risk against the profit they earn from the mid price spread for each trade, benefit from fee rebates, and in illiquid markets face little competition. As **contractual market makers** for exchanges and cryptocurrency markets, we earn a fixed monthly fee for the provision of liquidity, using our trading system to add liquidity to the market and hedge our inventory exposure in real-time. Contractual market making also allows us to pass on the benefit from advantageous fee structures and relationships with exchanges to our proprietary trading strategies.

Mean reversion describes a broad category of near-arbitrage strategies — such as pairs trading, statistical arbitrage, or cash-and-carry futures arbitrage — which rely on the convergence or divergence of asset prices. As less sophisticated arbitrageurs and trading shops are pushed out of the market due to overcrowding (alpha decay) of obvious trading strategies, the capacity to develop and algorithmically execute these higher-complexity strategies positions us to become a dominant market player. Anecdotally, we're already seeing less complex players leaving the market because "there are no more trading opportunities" even as we've **consistently generated positive returns** through a bear market, in no small part thanks to these strategies.

Tech Stack & Architecture

The ability to clearly and concisely define trading strategies is our core design goal and is why we are able to architect and operate complex trading strategies with **complete test coverage** and negligible bugs. Our system is written end-to-end in **Clojure** and we define trading strategies and order execution instructions using a small **embedded DSL** which allows us to focus on *what* the strategy has to do, while relying on the underlying system to figure out *how* to do it.

For example, the following is how we would **define a market making strategy** that places orders for **10BTC at 0.25%** on either side of the mid price, increasing its quantity on one side or the other depending on how much has filled on the other side.

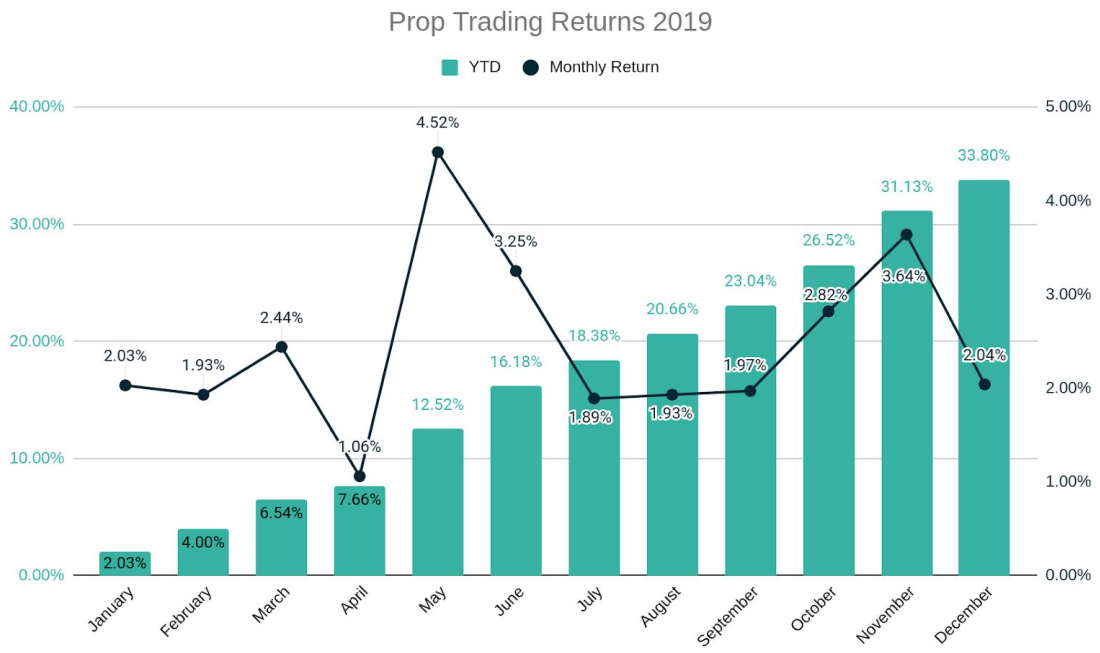
```
40
41  (def naive-market-maker
42    (strategy "Bitso BTC/MXN Market Maker"
43      :bid (spec->order
44             {:buy (fn [this] (- 10M ;; Start with 10 BTC, adjust after filling
45                                 (get-in this [:all-deltas :bitso "btc"])))
46              :at  (midprice - [25 :bps]) ;; Place 25 basis points below mid price
47              :as  :maker ;; Compete with ("penny jump") other orders
48              :on  [:bitso "btc/mxn"]})
49      :ask (spec->order
50             {:sell (fn [this] (+ 10M (get-in this [:all-deltas :bitso "btc"])))
51              :at   (midprice + [25 :bps])
52              :as   :maker
53              :on   [:bitso "btc/mxn"]})))
54
```

Our system is capable of connecting with multiple markets on each of dozens of exchanges at the same time, running several compartmentalized trading and market making strategies, with each **placing tens of orders** and adjusting their prices constantly. Our novel architecture also **internally fills trades** between our own strategies when it can do so while respecting their limit prices, thus saving us the fees we would otherwise pay to exchanges and automatically “merging” disparate trading strategies when market conditions make it advantageous to do so.

Profit & Loss

A nice property of market-neutral quant trading is that performance is truly an indication of success—of **a systematic edge**. Contrast this to an investment scheme capturing beta exposure, wherein performance could be outstanding even in the absence of a robust investment strategy.

The annual P&L from our prop trading strategies was 18.45% in 2018 and **33.80% in 2019**. Our growing P&L has mirrored the evolution of our technical and administrative capacities, which we feel are currently at an inflection point — now that we have developed a robust trading system and validated our trading strategies against the market, we will be successful to the extent that we are able to (1) access trading capital, (2) optimize the efficiency of our trading strategies, and (3) expand to new markets.



The only significant confounding variable when measuring our trading performance is **market volume (not direction)**, which is positively correlated with our returns. Luckily, crypto is still very much a growing market, so we expect that dynamic to work in our favor in the medium and long term.