HOW HFTs MAKE MONEY

The strategies used by most HFTs to make money are usually infeasible to implement for retail traders without access to the extremely expensive low-latency systems and connections that HFTs have access to. In general, below are three popular strategies used by these giant firms to make huge profits.

MARKET MAKING

Market making is a strategy employed by HFTs to profit from the bid-ask spread, which is the difference between the **highest** price a buyer is willing to pay (the bid) and the lowest price a seller is willing to accept (the ask) for a particular security. HFTs act as a market maker by providing liquidity to the market by simultaneously posting competitive bid and ask quotes for a security. They can do this better than any other competing traders because of their access to extremely low-latency hardware which is capable of making trades on the orders of microseconds. Nowadays, HFTs have begun deploying the simpler strategies on FPGAs to get this time down to just a few nanoseconds. Note that in some cases, HFTs might even have access to part of a brokerage's order-book, allowing HFTs to do market making even faster. Example: Robinhood CEO says payment for order flow is here to stay - CNBC.

Example: Suppose an HFT market maker is quoting a bid price of $100.00 and an ask price of $100.02 for a particular stock. If a buyer places an order to purchase the stock at the ask price of $100.02, the HFT will execute the trade and pocket the $0.02 spread. Simultaneously, the HFT may update its quotes to maintain a tight bid-ask spread, potentially quoting a new bid of $100.01 and a new ask of $100.03.

HFT firms make money by capturing the bid-ask spread millions of times per second across multiple financial instruments. This is mostly done completely algorithmically using complex risk-management strategies that is built to exploit their extremely expensive and low-latency infrastructure. Very infeasible for a retail trader to replicate. For example, HFTs are known to have spent millions on optic fiber cables across oceans and other crazy satellite / radar based setups to speed up information flow. A retail trader cannot hope

to compete here. The best we can do is probably setup a server at the co-location space that works completely autonomously. However, note that even in this case, we are likely to make losses due to the massive exchange fees that we have to pay as retail traders. Usually, HFTs have agreements in place with the stock exchanges to have lower brokerage fee in exchange for the liquidity that they provide to the exchange. In some cases the exchanges even pay the HFTs a steady stream of income via rebates for the liquidity & market making services that they provide to the exchange.

DIRECT COUNTER PARTY CREDIT

Direct counter party credit (DCPC), also known as anonymous execution, refers to a trading arrangement where a large institutional investor or asset manager can execute trades anonymously through a market maker or liquidity provider, such as an HFT firm. This allows the institutional investor to avoid revealing their trading intentions to the market, which could potentially affect the share price. Here the HFT acts as the direct counter-party to the trade.

Example: BlackRock, a large asset management firm, wants to accumulate a significant position in a particular stock without revealing its intentions to the market. BlackRock contacts Optiver, an HFT firm, and negotiates a DCPC agreement. BlackRock then sends its buy orders to Optiver, who executes the trades on various exchanges, acting as the counterparty. Optiver usually negotiates to sell the stock to BlackRock at a higher price than the current market price or charges a commission. BlackRock agrees because simply executing an enormous buy order would simply lead to a huge increase in the stock price which would ultimately cost BlackRock more. As a market maker, Optiver has access to trading exchanges around the world and also the high speed hardware and market making ability to slightly adjust the bid-spread to lean toward a certain direction. This allows Optiver to finish the trade in small chunks, using the slightly skewed bid-spread over a reasonable period of time (say a week).

HFT firms profit from DCPC arrangements by collecting commissions, capturing the bid-ask spread, and potentially benefiting from any short-term price movements that may occur during the execution of the institutional investor's orders. This is also infeasible for your average retail investor to work

with due to their lack of access to large funds, low latency hardware and the contacts.

ARBITRAGE

Information arbitrage between exchanges is a strategy employed by HFTs to exploit temporary price discrepancies that may arise between different trading venues. HFTs utilize their high-speed trading systems and low-latency data feeds to quickly identify and capitalize on these price differences before they are eliminated by other market participants.

Example: Consider a scenario where the same stock is trading at $100.00 on Exchange A and $100.05 on Exchange B. An HFT firm with access to real-time data feeds from both exchanges can quickly detect this price discrepancy. The HFT firm can then simultaneously place a buy order on Exchange A at $100.00 and a sell order on Exchange B at $100.05, capturing the $0.05 price difference as profit (before accounting for any transaction costs).

In India, this is commonly exploited by traders trading between NSE and BSE. But, HFTs can exploit these arbitrages across the world very fast too. For example, they could exploit arbitrage opportunities between TSLA trading on the Frankfurt stock exchange and the NYSE. They are able to do this better than anyone else because they usually have access to ridiculously expensive equipment for carrying out these trades extremely fast. Trans-Atlantic cables and such.