

# In the world of crypto trading, it's better to be smart than fast

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**In an industry as technology-centric as crypto trading, it's somewhat ironic that speed might be less important than many people might think.**

Throughout history, speed has been a decisive factor in determining the success of trading firms, while technology has been a decisive factor in determining speed. As latency has gone from being measured in milliseconds to microseconds to nanoseconds, whole segments of the financial ecosystem have been built solely on the ability to shave a few miniscule fractions of a second off trade times.

So, as crypto trading takes off, it would be natural to assume that speed would play a similar role.

Yet crypto has some unique features that can dull the impact speed normally has. For high-performance trading firms, success is likely to be based much more on how smart their order routing systems are than how fast they are. The problem

is, it's easy to conflate speed with smartness because smart order routing historically has been all about just knowing where the best prices are, and that often came down to how fast the SOR systems were.

Smart order routing for crypto trading actually requires rethinking what "smart" means in this context. A more appropriate term might be smarter order routing. But before talking about that, it's worth understanding why speed is such a different beast for crypto assets.

#### **WHEN A FERRARI MAKES NO SENSE**

You wouldn't use a Ferrari if you wanted to haul lumber down a dirt road. Yes, you could do it, but all the speed built into the car's engine would be of little use. And there are

far better types of vehicles for this kind of job.

Why does this analogy apply to crypto? It comes down to a couple of structural factors.

The first of these is tick size. Think about Bitcoin. The tick size is a penny, on an asset that trades in the thousands of dollars. That ratio is similar throughout the crypto universe. When the tick size is that small compared with the asset price, it has some clear effects. The key one is that it disincentivises speed.

In equities, futures markets or foreign exchange, there's always a race to be at the front of the queue because the firm at the front of the queue gets to interact with incoming market orders. But in crypto, with a tick size that is so small, it's often

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Figure 1: Example of Bitcoin bid/ask prices over a 24-hour period



Figure 2: Zoom in on shorter period showing spread of over \$100 developing between the exchanges, due to large opposite orders being executed on different exchanges.

going to be possible to jump to the front of a queue by altering a quote by an infinitesimally small fraction of the asset price.

Another way to think about this is to consider how high-frequency trading (HFT) firms make their money. A lot of

HFT profits come from mean reversion strategies. This kind of trading method has been compared to snatching up pennies on the road in front of a steamroller. If you're fast enough, you should be able to do it consistently and over time make money. There is always the risk of getting flattened, for

instance such as when markets gap and a firm hasn't been able to get out of a trade quickly enough. But as long as your systems are fast, you can usually square up before getting hurt badly.

For high volume markets where the tick size-to-asset price ratio is generally much smaller, this strategy can work well. But for crypto assets, there will not be enough pennies to make it worth the while and the risk of getting run over is much higher due to market dynamics such as fragmented liquidity.

A second big structural factor is physics. Trading in crypto is unlike other markets because the venues and the liquidity are spread out across the entire planet. You have markets trading in Asia that are transacting the same assets with markets on the east and west coast of the United States, not to mention multiple centres throughout Europe.

In such an environment, colocation will make little difference. What matters much more is having a centralised location for all the data to flow into. This changes the entire approach when it comes to trading system architecture. The good news is that the many millions of dollars spent on colocation in the equities and futures markets don't need to be spent for crypto.

While colocation is not critical or even necessary it is worth noting there is a growing interest for established connectivity via a data centre. Costs and scalability work well in the cloud whereas the data centre has the additional benefits of security. Compliance is also a factor considered by institutional market participants that are subject to regulations.

### THE GRAND BAZAAR

While crypto trading strategies may not be based on the same principles as HFT, that doesn't mean that mean



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reversion doesn't take place or doesn't matter. In fact, on many individual exchanges, there is plenty of evidence that shows that mean reversion occurs all the time. As a result, for any firm wanting to get the best prices, it needs to be aware of what's happening on all the available markets.

Crypto trading does not have a regulatory requirement like the U.S. equity market does with Reg NMS, which mandates a consolidated feed

of prices and allows any trading firm to trade with knowledge of what prices are available throughout the market. For crypto, that puts the onus on a firm's smart order routing technology to try to achieve the same feat.

We've used the Ferrari and the steamroller analogies. We'll now offer one last analogy: Trading in crypto can be compared to wandering into the Grand Bazaar in Istanbul. It would never make sense to talk to just one

vendor. You need to walk around and talk to many of them or you run the risk of paying way too much. Without the equivalent of a Reg NMS, those vendors in the bazaar can quote wildly different prices and a would-be buyer would never know.

But even if you sent an assistant out to find out what all the vendors were quoting from around the bazaar, that still wouldn't be good enough. To get the best prices, you would need to give your assistant instructions for how to talk to each vendor and the instructions would vary according to the vendor. It's the same for crypto trading. You need to know not just where the best prices are, but what are the best ways to trade.

This need for smarter order routing is much more acute in crypto than for other asset classes. For instance, in crypto trading, a lot of the liquidity might be OTC. That could require a different approach than what's needed on one exchange or another.

#### PRACTICAL MATTERS

Given the way that crypto liquidity is so fragmented, what are the options for an institution looking to trade?



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There are two basic approaches. The first would be to establish accounts with the marketplaces you want to do business on and to build your own infrastructure. The second would be to work through brokers who already have smart order routing and algorithmic trading available. There is a third option, but it is still in development. Some firms are looking at the possibility of creating consortiums that would allow member firms to trade across multiple platforms.

But whatever route a firm chooses, there are idiosyncrasies to the crypto market that a smart order router needs to consider. For example, due to the tick size factor, the depth of book for crypto is so much deeper than in other asset classes. If you go 10 to 20 price levels down, you'll probably get 90% of the displayed liquidity in an equity market. But to get 90% of displayed liquidity in crypto, you might need more than 1,000 price levels. Your SOR needs to be tailored accordingly.

There may be some firms that want to build their own infrastructure and establish accounts with venues all over the world. The cost will run into

the millions but depending on the business model and the end goal, it could still make sense for them. But for the majority of firms that simply see trading opportunities in this space, the second option of working through an agent will be the most likely route.

#### MARKET EVOLUTION

The market's attraction may extend well beyond the typical crypto trader. As the market evolves, retail foreign exchange brokers may find it cost efficient to be able to do crypto trading in size to take advantage of fiat currency to cryptocurrency pricing.

For example, instead of trading dollars for yen, a market participant could buy crypto assets in dollars and sell them in yen. Depending on market conditions, execution costs for fiat currency trades made via crypto assets could end up being significantly cheaper.

Given the size of the FX market, the scope such savings is large. It also means that firms operating in both markets will have a better offering for their clients. They will be able to take advantage of more flows. This in turn potentially could expand the market ecosystem even further, making

well-designed smart order routers even more important.

It is still early days, but what's clear already is that some of the larger institutions have identified these possibilities due to the global nature of crypto trading. How fast crypto markets evolve, and in what ways, is uncertain. This is a market that in many ways is still in its infancy. But the possibilities are tantalising. Cross-border payments, globalisation of assets, securitisation – one could make a case for any of these being the Next Big Thing in crypto trading.

What one can say with certainty, however, is that critical mass has been reached. There is enough size and momentum in the crypto world – in terms of the numbers of participants and the volumes involved – that it's now a question of when, rather than if, for developments such as those just described.

As crypto does evolve, speed could take on the same pivotal role that it does in major liquid markets. Who knows, maybe someday we'll even find ourselves talking in terms of picoseconds and femtoseconds. But for the moment, it's all about brains rather than brawn.