Twitter Thread by macrocephalopod

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Some thoughts on how big market making firms (eg Jane Street, Susquehanna, Optiver) are structured. Note I have not worked at any of these firms so this is not based on any insider knowledge, just talking to people in the industry and extrapolating a bit.

> This is important to realize. The way many of these firms are structured is that they have a pure MM book (keep inventory low, stay hedged, clip spreads) and prop books to express a view. The prop book can trade with the MM book at (to first approximation) mid and a lot of their
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> — macrocephalopod (@macrocephalopod) February 15, 2021

A “pure” market making operation is based on clipping spreads, ie buy low, sell high, keep inventory low, keep risks (eg greeks) tightly hedged. Skew your bid/offer based on your inventory to try and offload it as quickly as possible without impacting your profit too much.

This kind of trading has enormous risk-adjusted returns (Sharpe > 10, ~no down days) but it’s hard to scale it because your P&L is a function of two things — volume and volatility — that you don’t have any control over.

This is a problem because the costs of running a pure MM firm (mainly infrastructure and employee comp) are increasing and profit margins are decreasing. So many firms turn to prop trading as a way to increase P&L at the cost of some Sharpe.

One way to approach this is to make your price skew dependent on factors other than your inventory, eg if you think the market is going up you skew prices a little higher to encourage people to sell to you and discourage them from buying from you.

(To some extent even pure MM firms do this since they use very short term signals based on the order book in addition to their inventory to skew prices, but I’m talking about adding longer term signals using a wider variety of input data.)

This also becomes hard to scale after a while because it relies on having a centralised book which has a view on everything, this creates coordination problems and increases risk of IP leakage as many more people can see the whole system.

So the approach that many places gravitate towards is having a central market making book (just using inventory and simple signals to skew prices) and satellite prop books which exist purely to trade with the firm’s capital. These prop books can

trade with the MM book

under some agreement, generally very favourable pricing if they are taking risk off the central book and less favourable if they are adding risk. These books can be run be completely independent teams which reduces coordination problems and IP leakage risk.

Now whenever a prop book thinks the price is going up they buy from the MM book which leaves the MM book short, they therefore skew their prices up to encourage others to buy from them and cover the short. The prop book alpha is transmitted to the MM book.

This simple but elegant mechanism solves many of the scaling problems inherent in running a MM firm. It is also why it is a mistake to think that you can “run over” a big market maker by trading heavily in one direction with them — they are capable of leaning

against or following your flow in their prop books depending on where they think the market is going. Fin.