

OFI *Conceptual Answers*

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1. What's the motivation behind measuring OFI at multiple depth levels of the order book?

Measuring OFI at multiple depths of the limit order book (LOB) allows us to capture liquidity dynamics beyond the best bid and ask. While the best level reflects immediate supply and demand, deeper levels contain strategic liquidity placement, such as hidden orders or anticipatory positioning. Capturing OFI at several depths gives a more complete view of latent market pressure and improves the predictive power for short-term price movements. Research shows that quote updates or cancellations at deeper levels often precede changes at the top of the book, making multi-level OFI more informative.

2. Why do the authors use Lasso regression rather than OLS for estimating cross-impact?

Lasso regression is preferred over Ordinary Least Squares (OLS) in high-dimensional cross-impact models because:

- It promotes sparsity by shrinking many coefficients to zero, effectively selecting only significant relationships.
- It reduces overfitting in settings with multicollinearity, which is common among correlated OFIs across assets.
- It improves interpretability and robustness by identifying only the strongest cross-asset influences.

This makes Lasso ideal for estimating cross-impact matrices, where many asset pairs may have weak or no relationship.

3. Why is OFI considered a better predictor of short-term returns than trade volume?

Trade volume aggregates the number of shares traded but does not distinguish between buyer- and seller-initiated trades. It lacks directional and structural context. In contrast, Order Flow Imbalance (OFI) incorporates both the side (bid vs. ask) and type (limit, market, cancel) of order book activity. It quantifies the real-time pressure from buyers versus sellers and is therefore directly linked to short-term price changes. Empirical studies consistently find OFI to be a stronger and more consistent predictor of near-term returns than raw trade volume.