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Financial intermediaries and contagion in market efficiency: the case of ETFs

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- This paper documents comovement across premia (i.e., the difference between ETF price and ETF NAV) of ETFs facilitated by the same lead market maker (LMM), and thus provide supporting evidence of capital constraint spillover of financial intermediaries to asset market.
- Findings:
 - There is strong comovement in the ETF premium for ETFs served by the same LMM.
 - Such comovement is only observed with old/new LMM before/after the change of LMM, mitigating the concern of self-selection of LMMs based on unobservable ETF characteristics.
 - By exploiting the COVID-19 induced liquidity shock to LMMs (managing different fraction of FI ETFs), a causal relation is established between market efficiency and LMMs' capital constraint using a DID approach.
 - A lot of heterogeneous analyses and robustness tests.
- Contribution:
 - Add to the literature on the impact of individual intermediaries' capital constraints on pricing efficiency.
 - Growing literature on how liquidity shocks/mismatch of ETFs could affect financial markets and propagate to various assets.
 - Identification using the COVID-19 shock to show that non-fixed income ETFs serviced by LMMs managing a larger fraction of fixed income ETFs experience greater premium.

Comment 1: The relation between pricing gap and LMM's capital constraints

- It is reasonable to conjecture that widen premia and the premium comovement across ETFs serviced by the same LMM is related to LMM's capital constraint shocks.
- But we cannot rule out *other factors* that may also drive the pricing gap or premium comovement.
- In other words, besides LMM-specific capital constraint, other LMM characteristics could also be the underlying driving force for the observed premium comovement.
- The observed comovement/price gap is *not* solely driven by LMM's capital constraint.
- It would be interesting to see the decomposition of the attributions from various sources, including the capital constraint channel and other channels.
- Alternatively, exploiting some exogenous shock to the capital constraint of LMMs (such as the DID analysis but maybe more directly targeting LMM's capital constraint) and how such liquidity shock propagates to ETF premium comovement can help pin down the story.

Comment 2: The role of aggregate funding condition

- The authors emphasize that their contribution is on the role of *intermediary-specific* capital constraint, and thus the finding is not about the aggregate funding condition.
- It seems it is quite difficult to disentangle the two forms of funding shocks, i.e., individual intermediary's capital constraint is closely related to the market-wide funding condition.
- For example, suppose the market-wide funding constraint is never binding, a demand-induced exogenous shock to one ETF results in pricing gaps, but the relevant LMM does not have to reallocate capital from other ETFs to exploit such mispricing; instead, it can reach for additional capital from the unbinding borrowing market.
- Or, suppose the funding constraint faced by an LMM is constant (unrelated to the aggregate funding shock), an increase of premia in other ETFs should lead to a decrease of premium in the focal ETF as the total funding capacity of the LMM is fixed, then we would expect a negative comovement of premia between focal ETF and other ETFs.
- On the other hand, when many individual intermediaries (LMMs in the current context) face funding shocks, the pricing gaps widen for the relevant ETFs, the aggregate capital market may be affected and the market-wide funding could deteriorate, leading to liquidity spiral as in Brunnermeier and Pedersen (2009).

- Several other papers on the impact of intermediaries' capital constraints on liquidity provision/asset prices include Macchiavelli and Zhou (2022), Bian et al. (2020), Richardson et al. (2017), and Lu and Qin (2021).
- Is the impact of LMM's capital constraint symmetric or asymmetric? Usually previous literature finds that negative funding shocks spillover faster. The authors may want to examine premium/discount separately.
- Is it possible that the common LMM, especially those large ones, has an internal trading desk for stocks held by the various ETFs so the LMM does not really need to "create/redemption" ETF shares. If so, what would be the impact on the findings?
- It seems there are less than 20 active LMMs (Table 1), can we use some LMM-specific capital constraint measure directly as the explanatory variable?
- The average absolute premium is quite stable over time (Figure 2). So does the variation of the absolute premium mainly come from cross ETF or cross LMM?

Comment 4: Additional suggestions on the empirical exercises

- DID analysis:

$$\text{raw } |Premium|_{i,j,t} = \beta_0 + \beta_1 COVID_t + \beta_2 FI \text{ Weight}_i * COVID_t + \beta_3 X_{i,t} + \alpha_i + \epsilon_{i,t}, \quad (4)$$

- $Weithgt_i$ is the continuous treatment variable calculated as the market cap of FI-type ETFs managed by the focal ETF's LMM scaled by the total market cap of all ETFs managed by the LMM.
- While in standard DID the treated/control groups are clearly determined, in such “fuzzy” DID, the treatment intensity varies across observations.
- LATE is achieved only under some conditions and alternative estimands are proposed for such fuzzy DID (see, e.g., De Chaisemartin and d’Haultfoeuille, 2018, 2020)
- Focus on leveraged ETF
 - Lu and Qin (2021) use the median return shortfall difference of (leveraged ETF – multiple of underlying index) and (unlevered index funds – underlying index) to measure the market-wide shadow cost of leverage constraints.
 - You could borrow the similar idea to construct the pricing gap using the leveraged ETF subsample, which has more close relation with LMMs' capital constraints.
- Residual premium or raw premium?
 - The model specification already has asset-day fixed effects, do you still need to orthogonalize the raw premium w.r.t. the non-LMM counterpart?
 - Day fixed effects (absorb by asset-day FE) should take care of time-varying commonality in mispricing across all ETFs.
- Change of LMM for an individual ETF may probably be not exogenous.
- Control for last month premium of ETFs serviced by the very same LMM.

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