

AFAANZ Report March 2022

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2. Project Title:

“Bond Mutual Funds: Systemic Liquidity and Derivative Use” (formerly: “Liquidity Management with Derivative Holdings”)

3. Updated Project Summary (500 words) including any variations between the project undertaken and the original application

The updated project outcome is in line with the original application, but with further development along the systemic risk component, i.e. interconnectedness across mutual funds.

Short Summary of the Project: Please see the Abstract of the attached draft, also in item 6 below.

Expanded Summary of the Project

Theoretically, we solve for funds' optimal trading, expected bond return, expected liquidity haircut, and the liquidity-value-at-risk. The liquidity haircut is endogenously determined through the aggregate equilibrium trading of all funds which sets the asset's price. The model highlights how funds' cash holding, optimal trading, and assets' expected returns and liquidity costs are determined not just by funds' individual portfolio holdings and fund flows, but also by the aggregate portfolio holdings and fund flows of other funds. In the baseline case where a bond price does not deviate from the fundamental value, optimal bond trading depends just on the bond's expected return and risk. However, once we allow the bond price to temporarily deviate from the fundamental value as a function of aggregate trading, other funds' cash shortfall affects optimal bond trading through the liquidity haircut.

Empirically, we find bond mutual funds exhibit a strong pecking order of what they choose to sell in response to fund outflows. Sensitivity of cash (bond) trading during outflows monotonically decreases

(increases) in cash shortfall. Pecking order in bond funds could lead to a sudden large selling in the illiquid corporate bond market when outflows exceed the cash reserves in many funds at the same time.

About half the funds in our sample hold at least one derivative at one point in time at least. Of those, some use them to hedge their returns and some to amplify them. On average, hedging funds hold less cash, more corporate bonds, and larger derivative positions than amplifying funds. Overall, though, hedging funds have lower systematic bond market risk than amplifying funds based on total fund return. This reflects the dominating effect of derivative holdings in fund returns, and therefore its impact on fund flows. Net fund inflows tend to be higher for amplifying funds, but also more volatile, than for hedging funds.

Derivative use is associated with differential portfolio choice in liquidity management across funds. Amplifying funds' trading of corporate bonds is sensitive to the interaction of fund flows with cash holdings, while hedging funds' trading is sensitive to the interaction of fund flows with liquidity costs of the bonds. This makes sense as amplifying funds typically hold enough cash to satisfy investor outflows, whereas hedging funds hold less cash, and so are more likely to have to liquidate bonds to satisfy outflows.

Asset pricing tests confirm that when funds are on aggregate selling a corporate bond, its liquidity costs (and changes in liquidity costs) increase and its returns decrease. The effect of funds' trading on liquidity costs are an order of magnitude larger at the Covid-19 onset in March 2020, and even stronger in the Financial Crisis in September 2008. Importantly, funds' aggregate cash shortfall becomes also statistically significant in explaining all of liquidity costs, changes in liquidity costs, and corporate bond returns during Covid-19, after controlling for the aggregate trading as well as security-level trading dollar volume (contemporaneous and lagged), interest rate risk, credit risk, and size. The significance of aggregate trading and aggregate cash shortfall highlights the systemic importance of bond mutual funds in the corporate bond market, with funds needing to account for the holdings and trading of their peers due to their connections through asset prices.

4. Funds Granted

Total: \$6,933

5. Detailed Report on Expenditure of Funds against Budget Items, with variations explained

Planned expenditure:

- Research assistance: \$5,250
- Consultation on Robotic Process Automation: \$1,683

Actual expenditure:

- Research assistance: \$5,277.30
- Consultation on Robotic Process Automation: \$1,655.70

6. Outcomes, for example, working papers, presentations and publications (give full details, including abstracts)

- Working paper: Please see draft attached.

Abstract: We show, both theoretically and empirically, that there is a systemic component to liquidity management by bond mutual funds. Through cash holdings and bond prices, funds are interconnected: a fund's optimal portfolio choice depends not only on the fund's own cash holdings but also on all the other funds' cash holdings, because an aggregate cash shortfall during outflows induces downward price pressure on bonds which the fund may need to sell. This is especially important during crisis periods for bond mutual funds, who exhibit a pecking order from liquidating cash to less liquid corporate bonds when financing fund outflows. We use novel data on derivative holdings to document large cross-sectional variation in how bond mutual funds use them, and its implications on liquidity management: some hedging their returns, some amplifying them, some not using them at all.

- Presentations given: Seminar at Australian National University (May 2021)

- Presentations scheduled: Federal Reserve Short-Term Funding Markets conference (April 2022), University of Melbourne (May 2022), European Financial Management Association conference (June/July 2022), Seminar at University of Technology Sydney (July 2022)

7. Future Intentions for this Project (give full details)

a) Conference submissions: We are submitting our paper on a rolling basis to all the major international and domestic conferences. We have been accepted to two conferences so far, and await the outcome of several others.

b) Journal submissions: Having incorporated feedback from our upcoming seminars and conferences this year, we plan to submit our paper to a top-3 finance journal.

c) Grant applications: We have no plan at this stage to apply for other grants for this project. We have, however, used our individual university research funds for extra research assistance and to pay the majority of the consultation fees for the Robotic Process Automation to collect data.

d) We see several interesting future directions for other papers using the data we have collected on this project.

8. Summary of Outcomes and Benefits

We have completed the data collection, solved an equilibrium model, found support for that model empirically, and written up our findings into a full draft of a working paper. There has been positive feedback on our findings, with acceptance into two major international finance conferences. Our findings are useful not just for academics, but also for practitioners and regulators.