Liquidity Stress Tests for Fixed-Income Mutual Fund: an application for Chile

Discussion

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Paper overview

Research question

Can Chilean bond funds meet large redemptions without disrupting local bond markets?

Empirical design

- Focus on Type 3 fund. Invests in medium and long-term debt
- Analyzes redemption scenarios examine allocation responses to flows (waterfall/pro-rata asset sales).
- Compare liquid assets with redemptions (RCR)

Main findings

- **Resilience:** all funds cover 4.8% outflows. At 13.1%, 7 funds (31% of AUM) have $RCR < 1$.

  Some funds would need additional liquidity under severe stress.
- **Liquidity:** declines with money-market holdings; recent partial recovery.

  Smaller liquid buffers make large withdrawals harder to meet.
- **Liquidation:** evidence suggests partial waterfall selling (liquid assets first).

  Paying departing investors can leave the remaining portfolio less liquid.
- **Market pressure:** pro-rata corporate-bond sales reach 48% of usual ten-day turnover.

  Large selling needs can put pressure on prices during stress.

Main comments

Big picture question: How does fund manager trading in distress affect financial stability?

- **Systemic amplification (contagion) is not quantified.**
  - Feedback from price losses to further redemptions, repeated selling waves and spillovers to other institutions is discussed but not estimated or simulated.
- **Market depth and price impact remain unmeasured.**
  - No estimated effect on bond prices, spreads or execution costs, and no direct measure of buyers' absorption capacity under stress.
- **Conditional selling needs.**
  - The paper compares simulated sales with normal ten-day turnover. The 47.6% corporate-bond figure relies on pro-rata liquidation.

What causes redemption flows? Regression design

- **Interest-rate risk.** Yield increases cause capital losses and can prompt investors to switch toward cash-like funds.
  - Bond price changes: $\frac{dP_c}{P_c} = -D_c dr$
  - **Yield-curve factors.** Estimate Chilean level and slope movements. Verify the factor loadings, including PC2 if using PCA, and assess curvature.
  - **Factor durations.** Interact lagged level/slope durations with factor changes.
- **Credit risk.** Wider spreads and weaker issuer credit quality can trigger withdrawals from bank and corporate bond funds.
- **Political and policy uncertainty.** Fiscal or institutional concerns can shift savings toward cash or foreign assets.

Illustrative panel regression:

$$NF_{i,t} = \alpha_i + \rho NF_{i,t-1} + \lambda_L D_{i,t-1,L} \Delta\zeta_{L,t} + \lambda_S D_{i,t-1,S} \Delta\zeta_{S,t} + \gamma' X_{i,t-1} + \delta' Z_t + u_{i,t}.$$

- Fund heterogeneity and fixed effects. Estimate fund FE within Type 3 funds. Date FE allow exposure tests but absorb common aggregate controls.

NF: net flows/beginning assets $\Delta\zeta_{L/S}$: level/slope changes
$D_{i,L/S}$: factor durations X/Z: fund/aggregate controls (Credit/political risk)

Economic predictors: incremental value

Nested benchmarks for Equation (3): industry-level net flows.

$$\begin{aligned} \text{AR:} \quad & NF_t = a + \rho NF_{t-10} + u_t, \\ \text{Macro only:} \quad & NF_t = a + b' z_t + u_t, \\ \text{ARX:} \quad & NF_t = a + \rho NF_{t-10} + b' z_t + u_t. \end{aligned}$$

z_t: changes in short/long rates, yield-curve slope, VIX and EMBI.

1. **Joint contribution beyond the AR benchmark.** Report R^2_{AR}, $R^2_{\text{full}} - R^2_{\text{AR}}$ and a HAC-robust Wald test of $H_0 : b = 0$.
2. **Incremental contribution of each predictor j.** Omit $z_{j,t}$, re-estimate all remaining coefficients, and report

$$R^2_{\text{partial},j} = \frac{R^2_{\text{full}} - R^2_{-j}}{1 - R^2_{-j}}.$$

   This is the share of variation left unexplained by the other regressors that predictor j explains. Also test the rate variables jointly.
3. **Validation beyond in-sample fit.** Compare rolling out-of-sample errors, including adverse episodes.

Liquidation strategies: empirical tests

Regression specification: $\Delta w^{k,\mathrm{adj}}$ valuation-adjusted weight change regressed on in - and outflows plus controls

$$\Delta w_{i,t}^{k,\mathrm{adj}} = \alpha_i^k + \tau_t^k + \beta_{\mathrm{in}}^k I_{i,t} + \beta_{\mathrm{out}}^k O_{i,t} + \gamma_k^\top X_{i,t-1} + \varepsilon_{i,t}^k.$$

Outflow hypothesis	**Liquid assets**	**Less liquid assets**
Pro-rata redemptions	$\beta_{\mathrm{out}}^L = 0$	$\beta_{\mathrm{out}}^J = 0$
Waterfall-style redemptions	$\beta_{\mathrm{out}}^L > 0$	$\beta_{\mathrm{out}}^J < 0$

- **Mixed baseline evidence (Table 4).** The recent most-liquid coefficient, -2.87^{**}, suggests buffer preservation, while sovereign/bank exposure declines.
- **Waterfall-like signs in recent stress (Table 5).** $+9.55^{***}$ for most-liquid assets and -10.86^{***} for corporate bonds. Full-sample stress coefficients are insignificant.
- **Patterns vary across episodes and volatility (Tables 6–7).**
- **Define most-liquid category consistently.** The most-liquid category excludes sovereigns, while the liquid buffer includes them. Aggregate the chosen classes on a common sample and test jointly.

Minor points

- **Correct the flow identity and timing (Eq. 1).** Let $V_{i,t}$ denote total AUM and $r_{i,t}$ the fund return from $t-1$ to t. Then

$$F_{i,t} = V_{i,t} - V_{i,t-1}(1 + r_{i,t}), \qquad \frac{F_{i,t}}{V_{i,t-1}} = \frac{V_{i,t}}{V_{i,t-1}} - 1 - r_{i,t}.$$

  The -1 arises only after normalizing by opening AUM.

- More rigorous definition of RCR_t
  - Exact definition of "Liquidity" measure missing
  - The variable "Shock" is only implicitly defined
  - Why is the critical value for this indicator defined as 1

Thank you for your Attention!