## SPECIAL FEATURE B: INVESTMENT FUNDS' LIQUIDITY HEADROOM UNDER HIGHER REDEMPTIONS[1]

### Motivation and financial stability relevance

Open-ended investment funds may face liquidity pressures when investor redemptions exceed the liquid assets available to meet them. In such circumstances, funds may need to sell less-liquid assets, particularly when redemption requests are large or persistent.[2] Such asset sales could amplify market stress through valuation and liquidity spillovers to other market participants. Assessing the relationship between funds' liquid-asset buffers and redemption pressures is therefore an important element of financial stability monitoring.

The Central Bank of Malta currently monitors this liquidity risk through its HQLA framework[3] and the RCR, which assesses whether funds' liquid asset buffers are sufficient to cover historical redemption pressures. An HQLA shortfall indicates that redemption pressures exceed the liquid assets buffer captured by the Bank's methodology. It does not necessarily imply that a fund would be unable to meet redemptions since the exercise does not model additional asset sales, borrowing, liquidity management tools or other management actions.

This box extends the existing analysis by estimating how much redemptions would need to increase before individual funds experience an HQLA shortfall and before such shortfalls affect a material share of aggregate sample NAV. It considers both fund-specific historical redemption rates and a common redemption benchmark. It also helps distinguish whether positions with limited modelled liquidity headroom reflect lower liquid asset buffers, more severe historical redemptions or greater reliance on the assumed liquidity of marketable securities.

### Methodology

The analysis focuses on 35 domestically relevant open-ended investment funds, with an aggregate NAV of €1.7 billion as at June 2026. Closed-ended funds are excluded because their units are generally not redeemable directly from the fund at investors' request and they are therefore not exposed to the same redemption-driven liquidity risk.

For each fund *i*, the liquid assets buffer ratio is measured using the Bank's existing HQLA estimates and expressed as a share of NAV:

$$h_i = \frac{HQLA_i}{NAV_i}$$

The HQLA ratio $h_i$ can also be interpreted as the gross redemption rate, expressed as a share of NAV, that would fully exhaust the modelled liquidity asset-buffer, assuming there are no liquidity sources or management actions beyond those captured by the HQLA methodology.

Two complementary approaches are applied.

#### *Approach 1: Own historical redemptions*

The first compares each fund's current HQLA ratio with its own highest observed historical redemption rate. For each fund, the historical redemption rate $r_i^{hist}$ is calculated as the highest cumulative gross redemptions recorded over any rolling four-quarter period from December 2016 to June 2026, expressed as a share of NAV at the beginning of the relevant window.

$$r_i^{hist} = max_t\left(\frac{Gross\ Redemption_{i,t}^{4Q}}{NAV_{i,t-4}}\right)$$

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[2] When faced with elevated redemptions, a fund may have several options besides selling less liquid assets. These may include drawing on cash inflows, using liquidity management tools, borrowing temporarily if permitted by its mandate, or in severe circumstances, applying exceptional measures such as redemption gates or suspensions. These responses are not modelled in the exercise.

[3] Camilleri, L., & Dos Santos Carinha, R. (2023). Box 4: Methodological update on the calculation of the liquid assets ratio for insurances and investment funds, *Financial Stability Report* 2023 (pp. 87–93), Central Bank of Malta.

This measure captures the highest cumulative four-quarter redemption pressure observed for each fund during the sample period. Since the episode may occur at different points in time, the historical redemption rate is fund-specific and need not refer to the same period across funds.

Each fund's historical rate is then progressively increased using a common scaling factor, λ:

$$r_i^{scaled} = \lambda\, r_i^{hist}$$

An HQLA shortfall arises when the scaled redemption rate exceeds the fund's HQLA ratio:

$$\lambda\, r_i^{hist} > h_i$$

The fund-specific critical multiplier is therefore:

$$\lambda_i^* = \frac{h_i}{r_i^{hist}}$$

A critical multiplier below one indicates that the fund's June 2026 HQLA ratio is already lower than its worst historical rolling four-quarter redemption rate. A multiplier above one indicates how many times the historical rate could be scaled before the modelled HQLA buffer is exhausted.

Fund-level results are also aggregated by NAV. At any multiplier λ, the share of aggregate NAV experiencing an HQLA shortfall is:

$$S(\lambda) = \frac{\sum_i NAV_i\, I\left(\lambda\, r_i^{hist} > h_i\right)}{\sum_i NAV_i}$$

where $I(\cdot)$equals one when a fund experiences an HQLA shortfall and zero otherwise. The analysis then estimates the minimum scaling factor required for HQLA shortfalls to affect funds representing at least 20% and 30% of the overall NAV.

### *Approach 2: Common redemption benchmark*

The second approach applies the same redemption rate to all funds. Each fund's HQLA ratio is compared with the median historical redemption rate across the sample, which stands at 18.6%. This provides a common benchmark and helps distinguish between shortfalls driven by severe fund-specific historical redemption rates and those reflecting comparatively low HQLA buffers. Taken together, the two approaches separate the effect of funds' historical redemption experience from the strength of their current liquid assets buffers.

### *Sensitivity analysis: alternative asset-liquidity assumptions*

The sensitivity of the results to alternative asset-liquidity assumptions is also assessed. This sensitivity simulates a deterioration in the liquidity profile of the marketable securities held by funds, whereby bonds and equities may need to be sold at larger discounts to their market value.

The Bank's existing HQLA factors are retained as the baseline, while the factors assigned to bonds and/or equities are reduced by one quarter of their baseline value. Accordingly, a baseline factor of 100% falls to 75%, a baseline factor of 85% is reduced to 63.8%, while a baseline factor of 50% falls to 37.5% (see Table B.1).

Three sensitivities are considered: a combined bond and equity adjustment, a bond-only adjustment and an equity-only adjustment. Under the bond-only adjustment, only the contribution of bond holdings is reduced; under the equity-only adjustment, only the contribution of equity holdings is reduced; and under the combined adjustment, both are lowered. Cash and deposits remain unchanged.

These adjustments test whether the baseline results depend materially on the liquidity attributed to marketable securities.

**Table B.1**

**HQLA FACTORS UNDER THE BASELINE AND ALTERNATIVE ASSET-LIQUIDITY ASSUMPTIONS**

*Per cent*

| Instrument | Issuer | Rating bands | Baseline factor | Equities-only adjustment factor | Bonds-only adjustment factor | Combined adjustment factor |
|---|---|---|---|---|---|---|
| Cash and deposits | | | 100.0 | 100.0 | 100.0 | 100.0 |
| Bonds | Government | BBB- to AAA | 100.0 | 100.0 | 75.0 | 75.0 |
| | Banks | AA- to AAA | 85.0 | 85.0 | 63.8 | 63.8 |
| | | BBB- to A+ | 50.0 | 50.0 | 37.5 | 37.5 |
| | NFCs & NBFIs | AA- to AAA | 85.0 | 85.0 | 63.8 | 63.8 |
| | | BBB- to A+ | 50.0 | 50.0 | 37.5 | 37.5 |
| Equities | All issuers | BBB- to AAA | 50.0 | 37.5 | 50.0 | 37.5 |
| Other financial assets (incl. loans, derivatives and fixed assets) | All issuers | n.a. | 0.0 | 0.0 | 0.0 | 0.0 |

*Note: Under the alternative assumptions, the baseline HQLA contribution of the affected asset classes is reduced by 25%. For example, a baseline factor of 85% falls to 63.8%, while a baseline factor of 50% falls to 37.5%. The adjustments are illustrative and do not represent alternative regulatory HQLA requirements.*

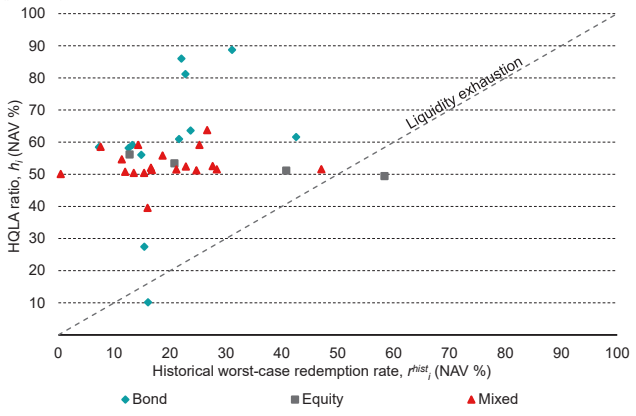
## Results

### *Resilience relative to funds' own historical redemptions*

#### *Fund-level results*

Chart B.1 compares each fund's HQLA ratio as at June 2026 with the highest rolling four-quarter gross redemption rate observed since December 2016. Funds above the 45-degree line hold sufficient HQLA to cover their highest observed 12-month redemptions, whereas funds below the line would face an HQLA shortfall under such a scenario.

**Chart B.1**
**HQLA RATIOS AND HIGHEST OBSERVED ROLLING FOUR-QUARTER REDEMPTION RATES**
*(per cent)*




Source: Central Bank of Malta.

Overall, only two of the 35 funds fall below the line. The underlying drivers differ across the two funds. In one case, the shortfall is driven by a relatively low HQLA ratio of around 10%, reflecting a portfolio composition heavily concentrated in assets that receive a zero weight under the Bank's HQLA methodology. The second case relates to an equity fund whose highest observed rolling four-quarter redemption rate of 58% exceeded its HQLA ratio of around 50%.

A further fund has limited headroom, with a critical multiplier of 1.10. This means that a modest increase of around 10% relative to its historical redemption rate would be sufficient to deplete its modelled HQLA buffer. Across the full sample, however, the median critical multiplier stands at 2.9, implying that the historical redemption rate of the median fund would need to increase by around 190% before the fund's HQLA buffer is exhausted.

The factors driving the critical multipliers differ across fund types. Among bond funds, differences in liquidity buffers are the main source of variation, with HQLA ratios ranging from almost 10% to almost 90% of NAV. By contrast, HQLA ratios are relatively similar across equity and mixed funds, mostly falling within the 50% to 60% range. As a result, differences in historical redemption patterns play a larger role in explaining variations in their critical multipliers.

The timing of the highest rolling four-quarter redemption rates also varies across fund types. Peaks among bond funds were mainly split between windows ending in 2017–2019 and 2025–2026, while those of mixed and equity funds were more concentrated in the recent period. Indeed, 15 of the 23 mixed and equity funds recorded their highest rate from December 2024 onwards. Equity funds recorded the highest median historical redemption rate, at around 31%, compared with 17% for mixed funds and 19% for bond funds, although the equity-fund sample consists of only four funds. Only four funds recorded peaks in windows overlapping either the COVID-19 market turmoil in 2020 or the 2022 interest-rate increases and bond-market repricing, and these temporal overlaps should not be interpreted as evidence of causality. Overall, the concentration of peaks in 2025–2026 suggests that the historical benchmarks used for many mixed and equity funds largely reflect relatively recent redemption experience rather than earlier market-wide stress episodes.

### *Aggregate sector results*

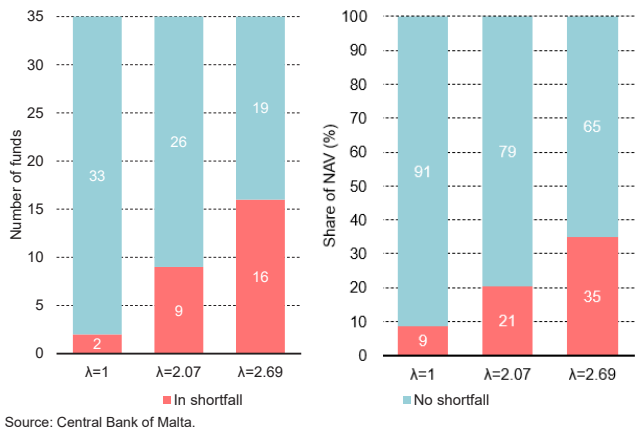
The fund-level results are aggregated by NAV to assess how liquidity vulnerabilities evolve as redemption pressures increase across the funds (see Chart B.2). At λ = 1, corresponding to the application of each fund's own highest observed rolling four-quarter redemption rate, the two funds identified earlier record an HQLA shortfall, which together represent less than 10% of aggregate sample NAV.

For HQLA shortfalls to affect funds representing more than 20% of aggregated NAV a multiplier of 2.07 is needed. This corresponds to a 107% increase relative to each fund's own historical redemption benchmark. Under this scenario, nine funds, accounting for 20.5% of aggregate sample NAV, would experience an HQLA shortfall.

More severe redemption pressures are required before liquidity strains become more widespread. A multiplier of 2.69, equivalent to a 169% increase relative to each fund's own historical redemption benchmark, is needed for funds accounting for over 30% of aggregate NAV to experience an HQLA shortfall. At this point 16 funds representing 35.1% of aggregate sample NAV would record an HQLA shortfall.

Overall, these results suggest that under the initial historical benchmark HQLA shortfalls are initially concentrated in a small number of funds. However, the share of aggregate NAV affected increases progressively as the scaling factor rises, while the liquidity headroom of funds not yet in shortfall also narrows. Nevertheless, a substantial share of the sampled funds maintains positive liquidity headroom under the most severe redemption assumptions.

**Chart B.2**
**DISTRIBUTION OF FUNDS BY HQLA COVERAGE UNDER SELECTED REDEMPTION MULTIPLIERS**
*(number of funds; per cent)*




Source: Central Bank of Malta.

## *Resilience under a common redemption assumption*

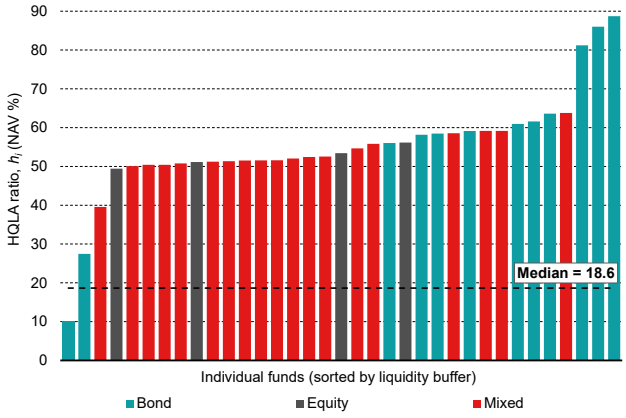
### *Fund-level results*

To provide a common benchmark across funds, Chart B.3 compares each fund's HQLA ratio with the median of the fund-specific highest observed rolling four-quarter redemption rates, which stands

at 18.6%. This is shown by the dashed line.

Under this assumption, only one fund records an HQLA shortfall. This is the same fund identified in the previous section as having a comparatively low HQLA ratio of around 10%. The fact that the second fund identified under the fund-specific approach remains above the common benchmark confirms that its shortfall is driven by its exceptionally high historical redemption rate, rather than by an HQLA ratio that is low relative to the rest of the sample. Meanwhile, one additional fund lies relatively close to the benchmark, with an HQLA ratio of around 27%. By contrast, the remaining funds hold substantially larger HQLA buffers, with most ratios ranging between 50% and 65% of NAV, more than double the median redemption rate.

**Chart B.3**
**HQLA RATIOS RELATIVE TO THE COMMON REDEMPTION BENCHMARK**
*(per cent of NAV)*




Source: Central Bank of Malta.

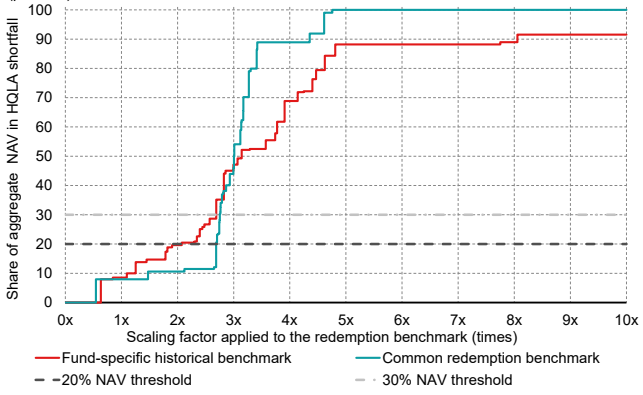
### *Aggregate sector results*

The common redemption rate is then progressively increased to assess how much redemption pressure would be needed for the HQLA shortfalls to affect larger shares of the sector. At the initial redemption rate of 18.6%, only one fund records a shortfall.

The common redemption rate would need to rise to 50.1%, equivalent to 2.69 times the initial median rate, before funds representing more than 20% of aggregate sample NAV, experience a shortfall in their HQLA. Under this scenario, five funds representing 20.8% of aggregate sample NAV record an HQLA shortfall. A relatively small increase in the common redemption rate to 51.3%, or 2.75 times the initial median rate, raises the share of affected NAV to 30.3%. At this point, eleven funds record an HQLA shortfall. The sharp increase in the number of affected funds over this narrow range reflects the clustering of several HQLA ratios around the 50% mark.

Compared with the fund-specific approach, a larger increase in redemption pressure is required under the common assumption for HQLA shortfalls to affect funds representing more than 20% of aggregate NAV (see Chart B.4). This indicates that the lower fund-specific threshold is partly driven by a limited number of funds with particularly elevated historical redemption rates. However, the results converge at the 30% threshold, suggesting that funds' HQLA ratios become more influential as redemption pressures increase across the sample. Since several funds have HQLA ratios at similar

**Chart B.4**
**SHARE OF AGGREGATE NAV IN HQLA SHORTFALL**
*(per cent)*




Source: Central Bank of Malta.
Note: The chart compares the fund-specific historical benchmark with the common redemption benchmark. Both curves are shown as step functions because funds enter HQLA shortfall at discrete scaling factors. The x-axis is limited to 10x.

levels, a relatively small increase in the common redemption rate causes several funds to exhaust their modelled liquidity buffers in close succession, resulting in a rapid increase in the share of aggregate NAV affected.

### *Sensitivity to alternative asset-liquidity assumptions*

#### *Fund-level results*

The baseline results are compared with three alternative asset-liquidity assumptions: a 25% reduction in the HQLA contribution of both bonds and equities, bonds only, and equities only. Cash and deposits remain unchanged.

The bonds-only adjustment does not bring any additional funds into shortfall when compared with the baseline. By contrast, both the equities-only and the combined adjustments increase the number of funds in shortfall to four, together representing around 14% of aggregate sample NAV.

The two additional funds, operating as mixed and equity funds, held critical multipliers of 1.10 and 1.25, respectively, under the baseline scenario. Equities account for more than 75% of their HQLA. Reducing the equity contribution by 25% consequently lowers their HQLA buffers by around one-fifth to one-quarter and moves both funds into shortfall. These additional shortfalls therefore reflect the combination of high reliance on equities within the funds' recognised HQLA buffers and historical redemption rates of around 47% and 41%, which were already close to their baseline HQLA ratios.

#### *Aggregate sector results*

At the aggregate level, all three adjustments lower the scaling factor at which HQLA shortfalls affect a material share of sample NAV. First, the adjustments reduce the HQLA contribution of bonds and/or equities, thereby lowering funds' estimated HQLA buffers. With a smaller HQLA buffer available to cover redemptions, a smaller increase in the critical multiplier is required for funds to experience an HQLA shortfall. Under the baseline calibration, the 20% NAV threshold is reached at a scaling factor of 2.07, consistent with the baseline results reported in Chart B.2. This falls to 1.90 under the bond-only adjustment, 1.77 under the equity-only adjustment and 1.56 under the combined adjustment. For the 30% NAV threshold, the multiplier falls from 2.69 under the baseline calibration to 2.03, 2.40 and 2.02, respectively (see Table B.2).

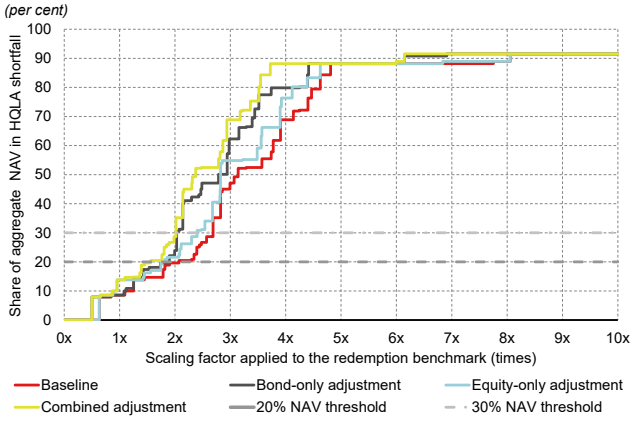
**Table B.2**
**HQLA SHORTFALLS AND CRITICAL SCALING FACTORS UNDER ALTERNATIVE ASSET-LIQUIDITY ASSUMPTIONS**

| HQLA calibration | Funds in shortfall at λ =1 | NAV in shortfall at λ =1 | Multiplier for 20% NAV | Multiplier for 30% NAV |
|---|---|---|---|---|
| Baseline | 2 | <10% | 2.07 | 2.69 |
| Bond-only adjustment | 2 | <10% | 1.90 | 2.03 |
| Equity-only adjustment | 4 | 13.90% | 1.77 | 2.40 |
| Combined adjustment | 4 | 13.90% | 1.56 | 2.02 |

Note: The table shows the scaling factors at which funds representing at least 20% and 30% of aggregate sample NAV experience an HQLA shortfall. Under the alternative assumptions, the HQLA contribution of bonds and/or equities is reduced by 25% relative to the baseline calibration. Cash and deposits remain unchanged.

The relative effects of the bond and equity adjustments vary across the two thresholds (see Chart B.5). The equity adjustment has a larger effect at the 20% NAV threshold, while the bond adjustment has a larger effect at the 30% NAV threshold. This reflects differences in the portfolio composition and size of funds closest to the NAV thresholds. The combined adjustment consistently produces the largest decline in the critical scaling factors.

**Chart B.5**
**SHARE OF AGGREGATE NAV IN HQLA SHORTFALL**
*(per cent)*




Source: Central Bank of Malta.
Notes: The curves are shown as step functions because funds enter HQLA shortfall at discrete scaling factors. The x-axis is limited to 10x.

## Main findings and conclusion

The analysis indicates that most of the domestically relevant open-ended funds in the sample have positive modelled liquidity headroom relative to their historical redemption experience. Thirty-three of the 35 funds hold HQLA buffers above their own highest observed rolling four-quarter redemption rates. For the median fund, the historical redemption rate would need to rise to 2.9 times its observed level, before its HQLA buffer is exhausted. This broad pattern is observed across fund types, although the extent and drivers of liquidity headroom vary considerably across individual funds. Overall, the results indicate that most of the funds considered could accommodate materially higher redemption pressures before exhausting their modelled HQLA buffers. From a financial stability perspective, this is relevant since liquid assets provide a first line of defence against forced sales of less-liquid assets and associated valuation effects.

Two funds, one bond fund and one equity fund, would nevertheless record an HQLA shortfall if their respective historical redemption benchmarks were applied to their June 2026 liquidity positions. The shortfalls reflect different underlying factors. The bond fund has a comparatively low HQLA ratio, as a large share of its portfolio is invested in assets assigned a zero weight under the Bank's HQLA methodology. In contrast, the equity fund recorded a relatively high historical redemption rate relative to its HQLA buffer.

Under the fund-specific approach, each fund's historical redemption rate would need to increase by 107% for HQLA shortfalls to affect funds representing more than 20% of aggregate NAV. For funds representing 30% of aggregate NAV, the required increase is 169%. Under the common redemption benchmark, which applies the same redemption rate across all funds, the common rate would need to rise by 169% and 175% for HQLA shortfalls to affect more than 20% and 30%, respectively, of aggregate NAV. The higher increase under the common assumption indicates that the fund-specific results are initially influenced by a limited number of funds whose own historical redemption rates are already high relative to the HQLA buffers. At the 30% NAV threshold, the two approaches produce broadly comparable results. This suggests that the level and distribution of HQLA buffers play a greater role as redemption pressures broaden across the sample.

The results are also sensitive to a deterioration in the assumed liquidity profile of marketable securities. Reducing the recognised HQLA contribution of bonds and equities by a further 25% increases the number of funds in shortfall at their historical redemption rates from two to four. The combined adjustment also reduces the increase in historical redemption rates required for HQLA shortfalls to affect 20% of aggregate NAV from 107% to 56%, and the increase required for shortfalls to affect 30% of NAV from 169% to 102%. The funds closest to shortfall are particularly sensitive to the equity adjustment, as equities account for a large share of their recognised HQLA buffers. At the aggregate level, the relative effects of the bond and equity adjustments depend on which funds experience a shortfall at each NAV threshold, as well as on their size and portfolio composition.

Overall, the positions with the lowest modelled liquidity headroom are concentrated in a limited number of funds but arise through different channels, including comparatively low HQLA ratios, unusually high historical redemptions, and a strong reliance on equities within the HQLA buffer. These findings remain conditional on the methodology and assumptions applied and should not be interpreted as predictions of redemption behaviour or fund distress. Future work could incorporate changes in market liquidity as redemptions rise, as well as common asset holdings and spillovers from simultaneous asset sales.