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Areas of reform of the MMF regulatory framework: an overview and potential options

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Overview

This note summarizes the policy options examined at international and EU level to reform the regulatory framework for money market funds (MMFs) and presents some preliminary considerations. The note first discusses the main vulnerabilities of MMFs and the liquidity strains experienced during the market turmoil in March 2020. It then provides a summary of the ongoing international work to address fragilities in the MMF sector and related policy proposals. Finally, it proposes some high-level principles that could guide the discussion and the selection of potential policy reforms for addressing vulnerabilities in the MMF sector.

Introduction and main conclusions

In this note we describe the main fragilities that characterize the money market fund (MMF) sector and the liquidity strains experienced during the market turmoil in March 2020. We then summarize potential policy options to reform the MMF regulatory framework. We also present some preliminary considerations on these proposals, based on a set of high-level principles that could guide the discussion and the selection of policy reforms that directly address vulnerabilities in the MMF sector. We have a preference for reforms that: i) reduce the liquidity mismatch in MMFs, ii) mitigate the first-mover advantage by limiting losses for MMF investors remaining in the fund, iii) refrain from creating cliff-effects.

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Our analysis reached the following main conclusions.

- We have identified a set of proposals which are closely related to the high-level principles presented. These include: i) removing the link between regulatory thresholds and the imposition of fees and gates; ii) the mandatory use of swing pricing or anti-dilution levies; iii) the removal of stable net asset value (NAV) for all types of MMFs; iv) additional liquidity risk-management requirements.

We are very supportive towards this group of reforms.

- We have identified a set of reforms which are potentially useful. Their effects, however, may largely depend on the details of their implementation and therefore further discussion and analytical work are needed to understand their benefits and drawbacks. These include: i) countercyclical liquidity buffers; ii) portfolio and investors' concentration limits; iii) capital requirements and minimum balance at risk.

We are broadly supportive of this group of reforms.

1. Main vulnerabilities of MMFs and liquidity strains experienced during the market turmoil in March 2020

MMFs provide short-term financing to banks, corporates and governments. They are also used by companies to invest excess cash and manage liquidity. By jointly performing these two activities, i.e. supply funding and cash-management services, MMFs perform liquidity transformation services by issuing shares that are redeemable on a daily basis, while holding certain asset classes that may be particularly illiquid, even in normal times – e.g. commercial papers, certificates of deposit and other money market instruments (MMIs).¹

Liquidity transformation by MMFs and other categories of investment funds² has attracted increasing attention on the part of regulators, practitioners, investors and academics because of the potential effects of the structural liquidity mismatch on financial stability.

Open-ended investment funds allow investors to acquire assets which may have a very long term maturity (in principle eternal, in the case of equities), while being able to redeem the funds' shares on a daily basis, often at very short notice. Investment funds can offer this service because what matters is the assets' actual liquidity, and

¹ The liquidity of the MMI market is generally low, even in normal times, for a variety of reasons, including the fact that investors tend to buy and hold these instruments due to their short maturity, implying low trading volumes in the secondary market.

² In many jurisdictions, rules are in place to require open-ended funds to limit the liquidity transformation they provide. While this is possible when investing in the most liquid asset classes (e.g. main equity markets, developed countries government bond markets, highly rated corporate bond markets), it may be challenging in the case of less liquid assets (e.g. commercial papers, certificates of deposits etc). The dramatic growth of non-bank finance and the search for yield originated by the low interest rates environment have induced open-ended funds to increase the investments in less liquid financial instruments. At the same time, pressure from investors has made it difficult for managers to reduce the liquidity of the redemptions, with the effect of increasing the overall liquidity transformation performed by open-ended funds.

not their maturity. Liquidity transformation (i.e. the difference between the actual liquidity of assets and liabilities) is therefore central to the operation of open-ended investment funds.

Among all open-ended funds, the situation of MMFs is unusual. Although, in principle, they have a very low maturity mismatch (the maximum average maturity of their assets and of the whole portfolio is restricted by regulation to the very short-term), they often face material liquidity mismatches as they hold assets to maturity while allowing investors to get back their money at short notice, sometimes in a matter of hours. This possibility is the fundamental reason behind the commercial success of MMFs: their investors are mainly institutional which – despite having easy access to the underlying assets – value the role of MMFs because of their simplicity (only one security), credit risk diversification and, most of all, near immediate liquidity.

While increased liquidity transformation provides benefits to the economy, it also entails some vulnerabilities associated in particular with the ‘first-mover advantage’. Funds’ investors selling their shares at date t are paid the end-of-day net asset value (NAV), which is calculated using the closing market prices at date t . If fund managers do not have enough (or prefer not to use the entirety of) cash buffers to meet redemptions requests, they need to sell part of their assets. This trading activity may, in some circumstances – e.g. illiquid markets, episodes of prices trending downwards – prompt MMF managers to undertake costly and unprofitable trades and/or to sell more assets than originally estimated on the basis of the redemption requests. While this is not necessarily a concern, being in fact related to the MMFs’ business model and the features of the underlying markets, it may generate losses for those investors remaining in the fund, as these portfolio adjustments are often conducted in the days following t . The misalignment between the payment of the shares (t) and the trading activity ($t+1, t+2\dots$) implies that most of these potential costs are not reflected in the NAV paid out to redeeming investors, but rather are borne by the remaining investors. This mechanism creates an incentive to sell fund shares pre-emptively, if an investor believes that other investors are going to sell their shares as well. This is, in other words, the essence of the ‘first-mover advantage’ in the mutual funds industry.³

In normal times, funds manage their liquidity to eliminate or reduce these costs, for example by timing the flows from maturing assets or keeping enough cash to meet expected redemptions. However, during periods of significant outflows, the funds’ cash may not be sufficient and forced sales of less liquid assets may reduce prices, exacerbating losses for the remaining investors.⁴ In these circumstances, the ‘first-mover advantage’ may result in a ‘systemic run’, whereby a large number of fund shareholders decides to sell their shares first if they expect other investors to also redeem their investments. Such a prospect, in fact, reduces the expected return from staying in the fund, and thus

³ The first-mover advantage is a broad concept. Outside the mutual fund industry, it refers to the competitive advantage gained by companies that are the first in the market to sell a product or a service.

⁴ The strategy adopted by the fund manager to meet investors’ redemptions, i.e. horizontal vs. vertical portfolio slicing, may also add pressure on market prices.

increases the incentive to withdraw.⁵ This behaviour, which is an example of strategic complementarities among investors, may enhance fire sale effects and introduce a nonlinear dependence between the initial market shock and the aggregate price impact related to redemptions.⁶ This effect may be amplified when: i) the price of funds' assets does not reflect current market conditions (i.e. they are not marked to market), ii) investors are able to redeem their units at a fixed value as happens for Constant NAV (CNAV) and Low Volatility (LVNAV) funds in the USA and EU, and iii) the fund has some characteristics, e.g. leverage, portfolio concentration in specific markets/segments, which magnify vulnerabilities. Due to strong interconnectedness within the financial system, liquidity shocks can spread from the investment funds sector to other parts of the financial system both directly, through credit exposure, and indirectly through fire sales, increases in market volatility, margin calls and drawdowns of bank credit lines.

During the market turmoil in March 2020, the 'first-mover advantage' was one of the main reasons underlying the redemption patterns observed, when a large number of MMFs faced significant liquidity challenges.⁷ The flight-to-safety behaviour in that period rapidly turned into broad-based selling. At the same time, MMFs experienced large redemptions from investors on the liability side and a severe deterioration of money market instruments' liquidity on the asset side.⁸ Outflows from US prime MMFs and euro-denominated MMFs in the EU reached approximately 11 and 15 per cent of AuM respectively, while Government MMFs saw record inflows. In particular, some of the LVNAV MMFs in USD and some Variable Net Asset Value (VNAV) MMFs in EUR were under severe distress. In Europe, outflows from LVNAV funds, especially for those denominated in US dollars, were more than double those observed for VNAV funds (totalling around €85 billion for LVNAVs, or 16 per cent of their total assets, vs. €34 billion for VNAVs, 7 per cent of their total assets).⁹ While no LVNAV funds breached the 20bps 'collar' in March, during outreach sessions with industry stakeholders, many institutional investors stated that they had been monitoring the risk of conversion to VNAV associated with LVNAVs during the most acute period of market stress in order to be ready to sell the funds' shares if this risk increased significantly. Furthermore, recent research shows that last March large and small investors responded differently to funds' liquidity positions.¹⁰ Outflows from funds with large investors were much more intense than those from funds with smaller investors. Furthermore, among the funds with large investors, withdrawals were roughly the same irrespective of the funds' liquidity position; in contrast, among funds with smaller investors, those with lower

⁵ Chen, Goldstein, Chiang, 2010, 'Payoff complementarities and financial fragility: Evidence from mutual fund outflows', *Journal of Financial Economics*, 97(2), pp. 239-262.

⁶ Capponi, Glasserman, Weber, 2020, 'Swing Pricing for Mutual Funds: Breaking the Feedback Loop Between Fire Sales and Fund Redemptions', *Management Science*, 66(8), pp. 3581-3602.

⁷ In particular, the breach of regulatory thresholds, which could lead to the application of gates for prime MMFs in the US – i.e. liquidity buffers below the 30 per cent threshold – and expectations of deviations between stable and floating net asset values of LVNAV funds above the 20bps threshold may have amplified the first-mover advantage.

⁸ IOSCO, 2020, *Money Market Funds during the March-April Episode - Thematic Note*, November.

⁹ Capotà, Grill, Vivar, Schmitz, Weistroffer, 2021, 'How effective is the EU Money Market Fund Regulation? Lessons from the COVID-19 turmoil', *ECB Macroeprudential Bulletin*, 12, April.

¹⁰ BIS, 2021, 'Investor size, liquidity and prime money market fund stress', *Quarterly Review*, March. In the same work it is also shown that in March, US institutional prime MMF managers mostly disposed of less liquid assets, thus exacerbating price dynamics and market-wide liquidity shortages.

liquidity profiles saw larger redemptions. Although no MMF suspended redemptions or used liquidity fees on redemptions and redemption gates thanks to central banks' interventions, the crisis highlighted once again the need to pursue further work on the resilience of the MMF industry.

2. The international debate on how to address vulnerabilities in the MMF industry

Following the 'dash-for-cash' episode in March 2020, various international organizations and standard-setting bodies, including the Financial Stability Board (FSB) and, at the European level, the European Systemic Risk Board (ESRB) and the European Securities and Markets Authority (ESMA), are discussing policy proposals to mitigate vulnerabilities in the MMF industry.

The FSB work programme on non-bank financial intermediation (NBFi), which is part of a broader work program for 2021 developed under the Italian G20 Presidency, includes a consultative report with policy proposals to enhance MMF resilience to be published in July and a final report delivered to the G20 in October. This work is based on the *Holistic Review of the March Market Turmoil*, which examined the drivers, the effects and the implications of the market stress brought about by the COVID-19 shock. The review underscored the need to strengthen resilience in the NBFi sector and contained, among other things, a broad work programme which will be carried out over the coming years within the FSB, as well as by standard-setting bodies (SSBs) and international organizations.

The ESRB Non-Bank Expert Group (NBEG) is also discussing how to address risks to financial stability arising from NBFi, including those from the investment funds sector. The aim is to maintain consistency with the international work adding, however, a specific macroprudential perspective to potential reforms applicable to the whole MMF sector, including funds that did not experience stress during last year's market turmoil. The work by the ESRB will consider a range of issues, including the wider markets in which MMFs operate, the behaviour and expectations of investors in MMFs, as well as the structure of MMFs and the liquidity management tools available to them, with a view to adopting a Recommendation by the end of 2021.

ESMA published a consultation document which discusses the potential reforms of the EU MMF regulatory framework ahead of the upcoming review of the MMF Regulation, which is expected to be launched by the European Commission between the end of 2021 and the beginning of 2022.¹¹ The consultation document describes key issues faced by MMFs during the COVID-19 crisis; it analyzes the potential role of (il) liquidity in private money markets, regulatory constraints, redemption fees and gates, credit ratings and other factors in amplifying MMF stress and discusses the potential reforms of the EU MMF regulatory framework.

¹¹ Article 46 of the MMF Regulation specifies that 'By 21 July 2022, the Commission shall review the adequacy of this Regulation from a prudential and economic point of view, following consultations with ESMA and, where appropriate, the ESRB, including whether changes are to be made to the regime for public debt CNAV MMFs and LVNAV MMFs'.

3. A description of potential policy proposals to address vulnerabilities in the MMF sector

In this section, we broadly describe the potential options aimed at strengthening the resilience of the MMF sector while preserving its benefits. As outlined in Section 2, the ‘first-mover advantage’ may lead to significant distress in the MMF sector through an adverse loop of falling prices and increasing redemptions. There are three main areas where authorities can intervene to limit the effects of the ‘first-mover advantage’:

- i) *Enhance MMFs liquidity profile.* Limiting the provision of liquidity transformation services, e.g. requiring funds to have more liquid portfolios and/or reducing the possibility of redeeming shares at very short notice;
- ii) *Reduce the price impact of MMF sales.* Reducing the potential aggregate price impact of funds’ sales by using forms of external support and/or defining specific tools to mitigate the effects of fire sales, e.g. rules on portfolio concentration and large exposures;
- iii) *Reduce losses for MMF remaining investors following outflows.* Introducing adjustments in the pricing mechanisms in order to make the ‘first-move’ costly, i.e. pass on to redeeming investors the trading costs otherwise imposed on the remaining investors.

Some of the potential policy reforms described below could fall into more than one of these areas, however, for presentation purposes, we group them by the main area to which they belong.

Policy options to enhance MMFs’ liquidity profile

On the asset side, a number of potential options could include reviewing the calibration of minimum liquidity buffers. The general idea is to improve the usability of such buffers. On the liability side, the goal would be to allow fund managers to manage redemption requests in an orderly fashion, for instance by limiting the possibility for investors to redeem at very short notice.

- *Additional liquidity risk management requirements.* Changes could include additional liquidity requirements, defined for instance in terms of assets with slightly longer maturities (e.g. biweekly liquid assets) or an additional liquidity threshold, e.g. a weekly liquid asset (WLA) threshold of 40 per cent.¹² Alternatively, or additionally, the composition of the liquidity requirement could be adjusted according to funds’ structural exposure to funding risk; funds with a larger share of institutional investors, both non-financial and financial corporations, could be required to hold larger buffers (and vice versa for funds with a larger share of retail investors). In order to support liquidity management better during stressed periods, authorities could also reinforce the use of stress tests by MMF managers, and/or add a requirement for MMFs to have a detailed crisis management plan, focusing on liquidity management in times of extreme market stress and specifying the features to be included in the plan.

¹² MMFs are required to maintain a certain level of liquidity in their portfolio, commonly defined as a percentage of daily and weekly liquid assets out of the total net assets (e.g. 15 per cent daily and 30 per cent weekly liquid assets).

- *Countercyclical liquidity buffers.* Under certain circumstances, e.g. when aggregate net redemptions from MMFs are significant, minimum liquidity buffer requirements could be reduced, either according to pre-specified rules or based upon discretionary decisions by the authorities. Minimum liquidity buffer requirements could be increased symmetrically, with a gradual approach, when market conditions improve.
- *Introduction of longer notice periods.* A fraction or all of the money invested in an MMF could be made accessible with a delay. This option would imply moving away from daily dealing. Redemption terms, including the notification period, could depend on the fund's liquidity profile.
- *Decouple regulatory thresholds from fees, suspensions and gates.* Authorities could consider removing the link between regulatory thresholds and the imposition of mandatory fees, gates or suspensions.¹³ New conditions for the activation of liquidity management tools (LMT) could be introduced in order to avoid cliff effects from breaching regulatory limits. Under this policy option, it would be necessary for authorities to devise a mechanism, including the relevant timing, to restore liquidity buffers once they are drawn.

Policy options to reduce the price impact of MMF sales

Potential proposals in this area would mitigate the possible adverse effects of fire sales on financial markets. Early redemptions by first movers increase the incentive of other investors to redeem early, driving down the price of the assets, which potentially generates incentives for further redemptions. Two types of policy option could be envisaged, i.e. micro prudential tools to increase protection against a fire-sale contagion within a specific asset class and reforms related to sponsor support.

- *Micro prudential tools.* These potential proposals are designed to enhance MMFs' resilience against a fire-sale contagion within specific asset classes. Possible tools could include: i) investors' concentration limits and (ii) portfolio limits. In the first instance, authorities could introduce limits on the percentage of MMF shares a given investor can hold. As such, one investor alone could not lead the fund to be suspended via their sole behaviour and redemptions. In the second instance, authorities could consider introducing limits on eligible assets, including tightening the limits on maturities for less liquid assets.
- *Sponsor support.* Policy options in this area could consider developing a common standard for the rules underlying private external support to MMFs. Options could include the clarification of the requirements concerning sponsor support – e.g. (i) whether permissible, and/or (ii) permissible under which conditions and by which parties, or (iii) prohibited – in order to reduce uncertainty among investors and market participants in future crises.¹⁴ Another potential option relates to the creation of a

¹³ In Europe, when WLA are below 30 per cent and daily outflows above 10 per cent, the MMF manager is required to inform the fund board, which in turn can consider whether or not to impose fees or gates. The final decision is for the fund board to take. This is contrary to what happens in the US where the breach of either of the two thresholds leads automatically to fees or gates.

¹⁴ Article 35 of the EU MMFR, for instance, forbids external support for MMFs where such support is intended for, or in effect would result in, guaranteeing the liquidity of the MMF or stabilizing the NAV. Interaction between MMFs and external parties is not entirely forbidden, however.

centralized and pre-funded facility for MMFs to transact with during a crisis.¹⁵ Under these schemes, funding could be provided privately by MMFs through the payment of a mandatory fee, by independent parties or by a combination of funding sources.

Reduce losses for MMF investors remaining in the fund during outflows

This area includes potential proposals to introduce structural changes and/or adjustments in the pricing mechanisms in order to make redeeming investors bear the trading costs otherwise imposed on remaining investors.

- *Removal of stable NAV.* All MMFs, both private and government, should always deal on the basis of a floating NAV. Constant NAV (CNAV) and Low Volatility Net Asset Value (LVNAV) would be converted into floating NAVs. Alternative reforms could simply modify the functioning of stable NAVs, especially around the 20bps ‘collar’; however, in this case risks related to the use of constant NAV, including the first-mover advantage and cliff effects related to the NAV collar, would remain.
- *Swing pricing or anti-dilution levies.* Swing pricing or anti-dilution levies would be adopted in prospectuses by all MMFs. With these options in place, a fund adjusts the dealing price for inflows or outflows to take into account the costs of purchasing or selling assets of the fund. Swing pricing and anti-dilution levies pass on the cost of liquidity to investors that redeem (or subscribe) their shares; this cost would otherwise be borne by investors who remain invested in the fund.¹⁶ These options may either apply to every transaction (‘full’ implementation) or only when net transactions exceed a pre-defined threshold (‘partial’ implementation). It would also mean introducing governance procedures for their activation, which could include the power for authorities to activate them in periods of market stress.¹⁷ The implementation of this option would also require careful consideration of the pros and cons of the activation of these options only during periods of stress versus a smooth, continuous adjustment of the swing factor or the levies as market conditions change.
- *Minimum balance at risk.* A minimum balance at risk (MBR) is a portion of each shareholder’s recent balances in a MMF – for example, 5 per cent of the shareholder’s maximum balance over the last 30 days. This MBR portion would be available for redemption only with a time delay (e.g. one month). During extreme events, such as when the fund is closed, the MBR would be used to absorb losses.
- *Capital requirements.* Capital buffers would provide dedicated resources to absorb losses in certain rare circumstances, such as when the fund suffers a large drop in NAV (for VNAV funds) or is closed.

Authorities could also strengthen the stability of the MMF sector by improving the functioning and transparency of short-term funding markets (STFMs), as MMFs are

¹⁵ There are a number of alternative models and structures that would need to be discussed in detail before having a clear assessment of the efficacy of this facility in reducing MMF vulnerabilities without creating moral hazard issues.

¹⁶ Swing pricing is a mechanism that allows the fund manager to change the shares' prices to reflect the costs related to trading activities arising from investors underwriting and/or selling activity. Anti-dilution levies are fees charged to redeeming investors in order to limit the dilution of the fund's NAV for those investors remaining in the fund.

¹⁷ Swing pricing may make MMF NAV not stable, meaning that any MMFs required to use swing pricing won't be CNAV.

significant investors in these markets. Potential options in this area could include: i) creating a market infrastructure promoting the shift of STFMs from a mainly phone-based, over-the-counter structure, to a platform-based, centralized structure; ii) increasing transparency with regards to the short-term funding markets (promoting the dissemination of more information on issuers, volumes, prices etc.); iii) harmonizing and enhancing international MMF reporting frameworks and disclosure of MMFs' investor base. These options could be beneficial for the ecosystem of money markets more broadly, but they would not directly address MMF vulnerabilities.

4. High-level principles and conclusions

In this section we suggest six high-level principles that could guide the discussion and the selection of potential policy reforms that directly address vulnerabilities in the MMF sector.

- *Comprehensive package of reforms.* Reforms of the MMF sector should aim at defining a package of mutually consistent measures, with interventions in all three main areas described above to reduce the effects of the 'first-mover advantage'.
- *Avoid moral hazard and risk shifting within the system.* Reforms based on the introduction of external support may reduce risks in the MMF business at the expense of increasing them in other financial sectors. Tools entailing a risk-shifting mechanism do not seem to provide a first-best solution; they would not reduce moral hazard and risk-taking behaviour either at single-entity or systemic level.
- *Preserve benefits provided by MMFs to the economy.* MMFs provide funding and cash-management services to banks, corporates and governments. Reforms that significantly alter the business model of MMFs or pose risks in terms of their viability would also reduce the benefits that MMFs provide to the financial and non-financial sector.
- *Ex-ante tools are preferable.* The goal of the new regulatory set-up should be first to mitigate the build-up of vulnerabilities in the MMF industry. Ex-ante tools, i.e. those defined at the inception /design phase of the fund and those that may be activated during the ongoing management of the fund, should be preferred to ex-post tools, i.e. those that may be used during emergency situations.
- *Adequate liquidity buffers.* Funds should maintain adequate liquidity buffers. Authorities should revisit the rules determining liquidity buffers and consider incentives for asset managers to preserve them in a flexible though effective way. Liquidity buffers should be calibrated according to a fixed set of weights defined on a rule-based manner according to the portfolio assets' categories. Authorities could ask MMFs, once they draw on their liquidity, to restore buffers over a given horizon. Proposals to calibrate liquidity buffers could reflect both: i) the characteristics of the asset side, e.g. funds with less liquid assets should be asked to hold higher buffers, ii) as well as those of the liability side, e.g. funds with a larger share of institutional investors should hold higher buffers.

- *Reduce the first-mover advantage substantially.* Investors in MMFs have the right to redeem their shares at a daily frequency at the fund's daily-close net asset value (NAV). During systemic distress episodes, MMFs may not have enough cash to accommodate substantial outflows. They may therefore need to sell assets, which – in some circumstances, e.g. illiquid markets – may lead to costly and unprofitable trades being conducted, with negative effects on future returns.¹⁸ While this is not an issue per se, as it reflects both the MMFs' business and the features of the underlying markets, it may create problems as these adjustments are often conducted in the days following the redemptions requests. Owing to this lag, i.e. the time between the payment of the shares and the trading activity, most of the costs are not reflected in the NAV paid out to redeeming investors, but are instead borne by the remaining investors. Reforms should make redeeming investors internalize all costs generated by their investment activity. Specific tools, e.g. redemption fees, anti-dilution levies and swing pricing, should be made available to MMFs and be mandatory in prospectuses. Their goal is to protect remaining investors from bearing the costs of buying/selling the underlying investments due to investors entering/exiting the fund (e.g. trading costs, brokerage fees, transaction charges and taxes).
- *Avoid cliff effects.* Regulatory reforms should refrain from creating cliff effects. We are in favour of policy options that: i) decouple the activation of both suspensions and gates from regulatory thresholds. This would require a more flexible use of liquidity buffers, which should be made more usable/releasable to accommodate unexpected liquidity withdrawals; ii) discontinue structural regulatory mechanisms that introduce cliff edges (e.g. C-NAV and LV NAV funds should be abandoned for all types of MMF, both government and private-debt funds); iii) substitute 'trigger-based' with 'continuous' tools so that adjustments can be gradual and related to market conditions (e.g. 'trigger-based' swing pricing should be discontinued in favour of a 'continuous' swing pricing, which adjust on a real-time basis with bid-ask spreads or other measures of market liquidity). While we support, in principle, continuous mechanisms, we are also aware that these methods may not necessarily be effective during periods of high volatility when abrupt changes in regulatory requirements, driven for instance by spikes in market indicators, may not be excluded.

In light of these high-level principles, Table 1 classifies each tool presented in the previous Section. Policy proposals are categorized in two groups: very supportive and broadly supportive.

'Very supportive' proposals are closely related to the broad principles presented at the beginning of this section. For example i) decoupling regulatory thresholds from the imposition of fees and gates and removing stable NAV reduce cliff effects; ii) the mandatory use of swing pricing may be inconsistent with a stable NAV, thus implying that a comprehensive package of reforms would necessarily need to link this proposal to reforms removing stable NAV.

¹⁸ Edelen, 1999, 'Investor flows and the assessed performance of open-end mutual funds'. *Journal of Financial Economics*, 53(3), pp. 439-466; Coval, Stafford, 2006, 'Asset fire sales (and purchases) in equity markets'. *Journal of Financial Economics*, 86(2), pp. 479-512.

Table 1: Mapping the policy tools proposed at international and EU level

	Policy options		
	<i>Reduce MMF liquidity risk</i>	<i>Reduce the price impact of MMF sales</i>	<i>Reduce losses for MMF remaining investors following outflows</i>
Very supportive	Additional liquidity risk management requirements		Removal of stable NAV
	Decouple regulatory threshold from fees, suspensions and gates		Swing pricing or anti-dilution levies
Broadly supportive		Assets	Liabilities
	Countercyclical liquidity buffers	Portfolio limits	Investors' concentration limits
			Introduce capital requirements
			Minimum balance at risk

‘Broadly supportive’ proposals are potentially useful. However, their effects may largely depend on the details of their proposed implementation and therefore further discussion and analytical work are needed to understand their benefits and drawbacks.

Policy options not included in the table are either inconsistent with the high-level principles or do not seem to be particularly effective in periods of market stress. For example, moving away from daily dealing would significantly change the business model adopted to date by this industry, posing risks to its viability; improving transparency may not be particularly effective in periods of market stress. Enhancing the role of sponsor support may shift risks among the financial system rather than reducing them and could increase moral hazard and risk-taking behaviour either at single-entity or systemic level.

In conclusion, the most effective way to deal with vulnerabilities in the MMF sector would be to remove the liquidity mismatch between assets and liabilities, either by restricting their portfolios only to liquid assets or by making funds’ shares less liquid (e.g. requiring a significant notice period). However, completely eliminating the liquidity mismatch would also imply substantially reducing the benefits associated with liquidity transformation (e.g. a wider investor base for MMI issuers and improved cash management of MMF investors). A trade-off in this area is immediately apparent: if authorities want to preserve the benefits provided by MMFs, some degree of liquidity transformation, and hence some vulnerabilities, must necessarily be maintained. Under this assumption, the existence of ‘residual vulnerability’ cannot be avoided. It cannot therefore be excluded that in periods of extreme market stress, some forms of external support provided either by the private sector (e.g. banks) or by central banks may be necessary. While we are not, in principle, against the idea of providing external emergency backstops to MMFs during episodes of systemic distress, we also note that formalizing any form of ‘permanent support’ should not be considered until the regulatory framework for MMFs is robust enough to dissipate concerns about moral hazard. Going forward, a comprehensive assessment of the pros/cons associated with different forms of external support should be carried out in order to anchor our stance on this topic to reasoned arguments.