

MEMORANDUM

To: File No. S7-03-13

From: Michael Spratt
Counsel to Commissioner Kara Stein
U.S. Securities and Exchange Commission

Date: December 18, 2013

Re: Money Market Fund Proposed Rules

On December 18, 2013, Commissioner Kara Stein and her legal counsel, Michael Spratt, met with Jonathan Curry and Thomas J. Rosenkoetter of HSBC Global Asset Management to discuss HSBC's comment letter on the money market funds proposal. HSBC also provided the attached papers on liquidity fees and run risk in money market funds.

Liquidity Fees

A proposal to reform money market funds

"This paper proposes the introduction of a liquidity fee on money market funds (MMFs); an initiative that could make MMFs more resilient under extreme market conditions and position them to withstand another deep and widespread loss of liquidity in the money markets"

3 November 2011

MMFs could be made significantly more robust if they were empowered to impose a 'liquidity fee' on redeeming shareholders, during periods of market dislocation

Summary

Since 2008, regulators and industry participants have been debating how to improve the robustness of money market funds (MMFs¹).

In this paper we propose that MMFs could be made significantly more robust if they were empowered to impose a 'liquidity fee' on redeeming shareholders, during periods of market dislocation. Although the paper focuses on US-domiciled MMFs ('2a-7 funds'), our proposal is also relevant to non-US MMFs, such as those domiciled in the European Union.

2a-7 funds provide an important service to investors (including corporate treasurers, financial institutions, sovereign wealth funds and others who have large cash balances they wish to place). These investors often prefer to diversify their cash investments in order to manage credit risk. 2a-7 funds offer an attractive solution, providing diversification and a degree of term premium, both of which might be difficult for investors to achieve on a standalone basis.

In most respects an investment in a 2a-7 fund is like that in any other investment fund; the monies invested are unambiguously at the investor's risk, and returns are equal to the return on the fund as a whole. However, there are two subtle, but important differences between the operation of a 2a-7 fund and a typical investment fund.

►First, the pricing mechanism of a 2a-7 fund means that an investor who invests today and then experiences a sudden need for cash tomorrow can redeem with minimal risk of loss of principal, even if interest rates and/or credit spreads have risen in the intervening period.

►Second, and more generally, there is a de facto mutualisation or cross subsidisation of risk and return between the investors in a 2a-7 fund: in essence, term premium accrues to all regardless of holding period whilst at the same time all investors have immediate access to their cash.

These two features work well and to the mutual benefit of all investors in almost all circumstances. However, in some circumstances they fail to appropriately price risk, and therefore can result in risk transference. Specifically, when markets are dislocated, costs that ought to be attributed to a redeeming shareholder are externalised on remaining shareholders and on the wider market.

Our proposal for a liquidity fee is intended to internalise those costs, and ensure they are paid by the redeeming shareholder and not transferred elsewhere. Since this will result in more effective pricing of risk (in this case, liquidity risk) we believe it will act as a market-based mechanism for improving the robustness and fairness of 2a-7 funds.

The challenge facing regulators is to reform 2a-7 funds in such a way as to make investors less likely to redeem in the event of a future market dislocation

1. The challenge facing regulators

MMFs experienced redemption pressure during the 'credit crunch' with perhaps the most significant example of this being in the US 2a-7 MMF industry. Between 15th –19th September 2008, investors redeemed USD369b from 2a-7 prime funds, representing 17.9% of those funds' assets under management².

The redemptions were caused by a series of headline events which undermined investor confidence in the banking system to which 2a-7 prime funds are exposed (including: the US Government's receivership of Fannie Mae and Freddie Mac; the sudden purchase of Merrill Lynch by Bank of America Corporation; the bankruptcy of Lehman Brothers, which caused a 2a-7 prime fund to 'break the buck'; the emergency funding of American International Group by the Federal Reserve; and so on.)

Redemptions from 2a-7 prime funds necessarily reduced the level of funding they could provide to the banking system, which exacerbated the funding pressure the banking system was already under in 2008. In that way, the redemptions were systemically consequential.

¹ For the purposes of this paper, a MMF is defined as an investment fund, whose objective is to provide investors with security of capital and daily liquidity, and which seeks to achieve that objective by investing in a diversified portfolio of high quality, low duration money market instruments.

US-domiciled MMFs are regulated by Rule 2a-7 of the Investment Company Act of 1940. Rule 2a-7 imposes detailed obligations on MMFs.

EU-domiciled MMFs are regulated, at a European level, by the Undertakings for Collective Investments in Transferable Securities Directives (UCITS Directives). The UCITS Directives are broad pieces of legislation, which do not impose detailed obligations on MMFs, equivalent to Rule 2a-7. Therefore, in 2010, the Committee of European Securities Regulators (CESR, now succeeded by the European Securities and Markets Authority, ESMA) issued guidelines which sought to define MMFs more closely. However, CESR's definition of a 'short term' MMF remains significantly less detailed than Rule 2a-7, and envisages MMFs with both a constant and a variable NAV per share.

In the absence of a European definition of MMFs that is as detailed as Rule 2a-7, the Institutional Money Market Funds Association (IMMFA) maintains a Code of Practice, which is binding on its Members, and imposes obligations equivalent to 2a-7 on their EU-domiciled funds. In addition, certain Member States of the European Union impose detailed obligations on locally-domiciled MMFs, notably in France in relation to 'monétaire funds'.

² MMFs outside of the USA also experienced redemptions, although not on the same scale, except for enhanced cash funds, which experienced very heavy redemptions.

A material amount of the money that investors redeemed from 2a-7 prime funds was reinvested in 2a-7 treasury funds. In other words, there wasn't a run from MMFs per se; rather investors sought to 'switch' their credit exposure from prime (i.e. the banking system) to treasury (i.e. in this case, US sovereign). The switch came to an end when the Federal Reserve's 'Temporary Guarantee Programme' effectively made 2a-7 prime funds 'as good as' treasury credit.

Although the Federal Reserve never made a payout under the Temporary Guarantee Programme (and, in fact, made a profit on the fees it charged MMFs to participate in the Programme) US taxpayers could have been exposed to losses, and therefore the reform of 2a-7 funds is quite properly under review.

On this account, the challenge facing regulators is to *reform 2a-7 funds in such a way as to make investors less likely to redeem in the event of a future market dislocation.*

The objective of a liquidity fee is to remove the free option to redeem during periods of market dislocation and ensure that costs are borne by redeeming investors

2. The case for imposing a 'liquidity fee' on redeeming investors

Like any other investment fund, the value of a share in 2a-7 fund is a function of the value of its portfolio. Since shares in 2a-7 funds are priced to two decimal places, they are sensitive to mark-to-market movements of 50bps (half of one percent) or more in the underlying portfolio.

Because it is rare for the portfolio of a 2a-7 fund to move by as much as 50bps, its share price *tends* to remain constant, hence the description of the fund as tending to have a 'constant' NAV.

In September 2008, funding pressure on the banking system meant that the market value of 2a-7 prime funds deteriorated - but not by as much as 50bps. Therefore, investors were able to continue to redeem from the funds at a constant price, and switch their proceeds into 2a-7 treasury funds, or elsewhere. But in fact, investor redemptions exacerbated the funding pressure of the banking system, which caused a further deterioration in the market value of 2a-7 prime funds. In effect, investors had a free option to switch, by externalising the cost of their redemptions on remaining investors in the fund, and on the market as a whole.

The objective of a liquidity fee is to internalise those costs, i.e. to remove the free option and ensure that the costs associated with redemptions are borne by redeeming investors. This will have three important consequences:

►First, a liquidity fee makes redemptions less likely. Specifically, since redemptions will be properly priced, investors will consider their needs more carefully; unless they believe that certain cost of the liquidity fee is less than the potential cost of remaining in a fund, then they will be unlikely to redeem.

►Second, a liquidity fee eliminates the 'run dynamic'. Specifically, in the absence of a liquidity fee, there is a first mover advantage, i.e. investors who redeem before mark-to-market movements reach 50bps will receive USD1.00 proceeds, which will cause the average mark-to-market value to dilute at the expense of remaining investors; therefore, all investors are incentivised to redeem first. This creates a run. By requiring investors to pay the full cost of their redemption, the first mover advantage is eliminated, as is the run dynamic.

►Third, a liquidity fee enhances investor protection, because even if investors do decide to redeem, their decision will be valued in such a way as to equalise remaining investors in the MMF.

The remaining part of this paper answers certain questions about liquidity fees:
How would a liquidity fee be calculated?
When would a liquidity fee be imposed?
Are there other ways of managing redemptions during a market dislocation?
What are the disadvantages of imposing a liquidity fee?
What evidence is there to support use of a liquidity fee?
How does a liquidity fee compare with other reform proposals?

We propose applying a liquidity fee to redemptions, based on the bid-value of the fund, such that the fund mid-value is not diminished by the redemptions

3. How would a liquidity fee be calculated?

We propose that a liquidity fee should be calculated as that amount required to equalise the mid-value of a 2a-7 fund's portfolio before and after any redemption, assuming the sale of a 'horizontal slice' of the fund's portfolio to meet the redemption payment.

The liquidity fee would be subtracted from the redeeming investors' proceeds, and retained as part of the net assets of the fund.

The arithmetic behind a liquidity fee is best illustrated by way of example:

Illustration of the calculation of a liquidity fee

Assume a 2a-7 prime fund with 1 million shares in issue received a 10% redemption request. Assume further that at the time of the redemption request, the mid-value of its portfolio was 0.9974, and the bid-value 0.9965.

In the absence of a liquidity fee, in order to fund the \$100,000 redemption payment, and given a bid-value of 0.9965, the fund would have to sell assets with a book value of \$100,351 ($\$100,000 / 0.9965$). This in turn would cause the mid-value to fall to 0.9970 ($(\$1,000,000 - \$100,351) \times 0.9974 / \$900,000$). The fall in the mid-value represents the externalisation of costs by the redeeming investor onto remaining investors.

In the presence of the liquidity fee, the mid-value would necessarily remain the same, and therefore the cost of the fee can be deduced as \$351 (i.e. $100,000 - (100,000 \times 0.9965)$) or 0.35%. (In effect, the liquidity fee is equal to the difference between the bid-value of the fund's portfolio, and par, in this case $1.0000 - 0.9965 = 35\text{bps}$.)

The consequence of imposing the liquidity fee is that the mid-value of remaining investors is unaffected by the redemption, and remains 0.9974 ($((\$1,000,000 - \$100,351 + 351) \times 0.9974) / \$900,000$).

Basing the liquidity fee on the sale of a 'horizontal slice' of assets is equitable to both redeeming and remaining investors. However, in dislocated markets this may well require the estimation of the bid value of assets that are not actively traded. It will therefore be necessary to have a robust bid pricing policy in place, which is agreed by the Board of Directors of the fund and implemented by the administrator to ensure independence.

An alternative to using the estimated bid value of the assets would be to impose a flat liquidity fee, of, say, 40bps. This has the benefit of removing the computational challenges highlighted above. The drawback with this method is that if the flat fee is higher than the true bid-value, then it penalises the redeeming investors, and if it is lower then it causes dilution of remaining investors and potentially reduces the disincentive to redeem.

Alternatively, the flat liquidity fee could be imposed on a 'contingent' basis, and any difference between the actual bids received versus the flat fee could be repaid to the investors after, say, one month. However, this would be very complex to administer.

On balance we believe our proposed method is the simplest and most equitable way of calculating the liquidity fee that ought to be paid by redeeming investors.

The liquidity fee should be imposed *pro-rata* on the net redemptions made on any business day. For example: if a fund experienced redemptions of USD10m and subscriptions of USD5m on a business day, then the fee would be applied to 50% of the each investors' redemption; and if a fund experienced redemptions of USD10m and subscriptions of USD2m on a business day, then the fee would be applied to 80% of the each investors' redemption. If the fund experienced a net subscription on a business day i.e. the value of subscriptions was greater than that of redemptions, then no liquidity fee would apply.

It has been observed that most redemption activity in September 2008 was attributable to institutional investors, whereas retail investors tended to remain invested. Therefore, it has been suggested that a liquidity fee ought only to be imposed on institutional investors, for example, by imposing it on redemptions in excess of 0.5% of the NAV.

We disagree with this suggestion, because we think all shareholders should be treated equally. In any event, many retail investors subscribe and redeem via nominees, sweeps and other 'aggregating' mechanisms that may fall foul of the 0.5% limit. Furthermore, setting a limit in this way would simply cause institutional investors to 'game' the system and redeem gradually, in amounts less than 0.5%.

Notwithstanding our concerns, we recognise that regulators may wish to explore options for exempting retail investors from a liquidity fee.

Liquidity fees would not be necessary during normal market conditions, but could be invoked during exceptional market circumstances, when the fund mid-value drops below a agreed threshold

4. When would a liquidity fee be imposed?

We do not believe a liquidity fee would need to be imposed on redemptions in 'normal' market conditions.

Although we recognise this means that subscriptions and redemptions can result in concentrations or dilutions (sometimes to the advantage of redeeming investors, and sometimes to the advantage of remaining investors) those effects are very small and have no substantial consequence. Indeed, what is striking about the pricing mechanism of 2a-7 funds is how well it has worked over almost thirty years. During those decades, 2a-7 funds have navigated periods of growth and recession; periods of high and low inflation; accommodative and restrictive monetary policy; spikes in interest rates; currency crises; and bank failures.

Therefore, we recommend liquidity fees should be conceived as a 'power' that can be invoked by 2a-7 funds in extreme circumstances, such as arose in September 2008.

In an ideal world, the Board of Directors of the fund would be responsible for deciding when those circumstances had arisen, and when to impose liquidity fees. However, Boards are conflicted to the extent that none would wish to be the first to impose a liquidity fee during a market crisis, for fear that would disincentivise investors from making any further subscriptions into their fund.

Therefore, we recommend that the Board should be required to decide whether or not to impose a liquidity fee if the mid-value of a fund's portfolio fell below a specified threshold, for example 0.9975³, and to communicate that decision to the regulator. Research indicates that this level would only arise in crisis conditions (see, for example, Standard & Poor's paper 'Shedding Light on the Shadow Net Asset Value of Money Market Funds').

The regulator would have the right to audit the decision of any Board that decided not to impose a liquidity fee when the mid-price reached 0.9975. If, following that audit, the regulator determined the Board had not acted in the interest of shareholders, then it would have the right to sanction the Board.

Since the decision of the Board would be subject to audit by the regulator, there would be a presumption that the liquidity fee would be imposed, but not an absolute obligation. This provides the Board with some limited discretion, and the manner in which a Board intended to exercise that discretion should be described in a liquidity fee policy.

Alternatively (or additionally) the regulator could have the power to require all funds to impose a liquidity fee. This might help manage contagion risk. For example, if the mid-value of a 2a-7 fund fell below 0.9975 and its Board decided to impose a liquidity fee, then there is a risk that investors in other 2a-7 funds might take fright and redeem, in anticipation that their Boards may be on the cusp of a similar decision. Therefore, if the regulator is informed by a Board of its intention to impose a liquidity fee, then the regulator could require all other 2a-7 funds to impose liquidity fees until further notice, i.e. until the crisis had passed.

In the USA, this would be viable since there is only one regulator. However, in the European Union, this would require close and rapid co-operation between multiple regulators.

Combining a liquidity fee with other emergency powers available to the fund Board should minimise the impact of redemptions during a crisis

5. Are there other ways of managing redemptions during a market dislocation?

Liquidity fees should be considered in combination with other mechanisms that can disincentivise redemptions during a financial crisis, namely in specie redemption payments and staggered redemptions which are described below. We believe the combined impact of those mechanisms would be substantial.

In specie redemption payments

The Boards of some European MMFs have the power to meet large redemption requests via an in specie distribution of a representative slice of the assets of the fund.

For example, a fund's prospectus may provide that the Board has the power to meet an individual shareholder redemption that is in excess of 5% of the net asset value of the fund by an in specie distribution of assets, if considered to be in the best interest of the fund's shareholders.

Economically, this is equivalent to imposing a liquidity fee, since remaining investors are equalised against the consequences of the redemption. But it has the added advantage of avoiding a forced sale of assets, which in distressed markets can cause prices to decline still further. Instead, the redeeming investors take delivery of the assets in a securities account, and thereafter can decide for themselves how best to manage the portfolio.

³ Many 2a-7 funds are rated by a recognised rating agency such as Moody's, Standard & Poor's, or Fitch. 0.9975 corresponds with the level at which a rating agency may take action on the rating of the fund – an action which in itself is likely to lead to heightened redemption activity

There are practical constraints on the ability of a fund to horizontally slice its portfolio, hence in specie distributions would not be an appropriate way of meeting small redemptions, and would need to be restricted, e.g. to redemptions in excess of 5% of the fund net asset value. There are other operational challenges, such as setting up the securities account and arranging for it to be managed.

If investors were specifically made aware of this power, then it is possible that they would seek to avoid investing in a 2a-7 fund in excess of the 5% limit. Insofar as that resulted in less shareholder concentration, that would be a positive outcome.

Staggered redemptions

The Board of some European MMFs have the power to meet large redemption requests over several days, rather than same-day as is normally true of MMFs.

For example, a fund's prospectus may provide that the Board has the power to limit the level of redemptions on any business day to 10% of the total number of shares in issue, and to meet redemptions in excess of that amount on a *pro rata* basis, and on subsequent business days when considered to be in the best interest of shareholders.

This mechanism allows the manager to slow down any redemption activity to better manage the fund in the interest of all investors.

A number of issues associated with liquidity fees have been identified, we believe that these can either be managed or are insufficient to outweigh the benefits of a liquidity fee

6. What are the disadvantages of imposing a liquidity fee?

There are a number of issues associated with liquidity fees, which are described and assessed below:

First mover advantage

We have proposed that the Board of a 2a-7 fund should be required to decide whether or not to impose a liquidity fee if the mid-value of the fund's portfolio falls below a specified threshold, for example 0.9975. It has been objected that this creates a 'first mover' advantage prior to that point, i.e. investors who redeem as the mid-value approaches 0.9975 will receive USD1.00 proceeds, which will cause the mid-value to dilute at the expense of remaining investors; therefore, all investors are incentivised to redeem first. The same objection has been made to the entire basis of pricing 2a-7 funds, i.e. that investors are incentivised to redeem prior to the mid-value approaching 0.9950 when a fund 'breaks the buck'. By that reasoning, a liquidity fee simply 'shifts the goal posts' of the first redeemer advantage from 0.9950 to 0.9975.

In an arithmetic sense, it is undeniable that there is a first redeemer advantage. However, we remain sceptical that this observation provides any real insight on investor behaviour:

►First, in order to achieve a first mover advantage, investors need to know the mark-to-market mid-value of the fund. But that is not public information. Indeed, although the SEC now requires 2a-7 funds to publish their mid-value per share, it has required that publication to be made sixty-days in arrears precisely to avoid creating a first mover advantage. (To further manage this risk, we recommend the SEC should *prohibit* publication of the mid-value per share more frequently than sixty-days in arrears.)

►Second, even if the mid-value per share was public available information or could be imputed, the deterioration in mark-to-market mid-values to 0.9975 is a cliff-edge phenomenon: there is insufficient time to be a first mover.

►Third, and as described elsewhere in this paper, investors *actually* redeemed in 2008 because they were worried about the exposure of 2a-7 funds to bank credit, not because of any supposed first mover advantage. That can be seen by virtue of redemptions from enhanced cash funds during the early stages of the crisis in 2007, which are truly variably priced and so provide no such 'first redeemer' advantage.

►Finally, many 2a-7 funds are now rated, and ratings agents will now consider downgrading 2a-7 funds whose mid-price is 0.9975. Therefore a trigger event at that price level already exists.

In our opinion, a liquidity fee removes the first mover advantage, that currently provides investors with a free option to redeem and to externalise the cost of their redemption on remaining investors, and on the market as a whole.

Effective closure of a MMF

It has been objected that imposing a liquidity fee on redeeming investors would effectively lead to an orderly closure of the fund, as any further subscriptions would be unlikely.

If a liquidity fee was imposed due to an idiosyncratic credit event in a 2a-7 fund then we would tend to agree with this view. However, if, as is more likely, a liquidity fee was imposed on a large number of funds as a consequence of a market-wide liquidity event, then we see no reason that investors would not continue to use 2a-7 funds once the crisis had passed.

In any case, the purpose of this proposal is to create a breathing space for regulators to resolve the underlying banking crisis that would have triggered the imposition of the liquidity fee. Some disruption to the normal operations of 2a-7 funds during that period would seem unavoidable.

Operational challenges

It has been objected that a liquidity fee would pose operational challenges, for example to bank-sweeps which are predicated on shares in 2a-7 funds being worth precisely one dollar.

It is our understanding that banks and others have been required to amend those systems in the event that a 2a-7 fund broke the buck and its shares were worth an amount less than a dollar. If so, then those system amendments would also enable liquidity fees to be imposed. In any event, if the liquidity fee proposal were taken forward by regulators any timeframe for implementation should take into account factors such as required system changes.

Other issues

Tax and accounting issues seem to bedevil all proposed reforms of 2a-7 funds, and no doubt there are issues associated with the imposition of liquidity fees.

For example, one would need to consider whether the redeeming investor should treat the liquidity fee as a deductible expense, or a short term capital loss. One would also need to ensure that the imposition of the liquidity fee did not impact the pricing of the fund's portfolio or shares, or the disclosure of the fund as 'cash and cash equivalent' in the books and records of the redeeming investor.

We are aware of examples of liquidity fees being applied to MMFs, and understand that they were implemented to protect remaining investors from the consequences of redemptions

7. What evidence is there to support the use of a liquidity fee?

We are aware of at least two examples during the credit crisis where a liquidity fee was applied in a MMF and a suite of international enhanced cash funds. Different ways of implementing the liquidity fee were adopted in each case but it is our understanding that the rationale for their implementation were the same, namely to protect remaining investors from the consequences of redemptions.

In November 2007 redemptions were suspended from Florida's Local Government Investment Pool following redemptions from the MMF and a fall in assets from USD27b to USD15b. Subsequently the MMF was restructured with the fund split into two with a fixed liquidity fee of 2% charged on the fund that was created to hold the less liquid assets.

In 2008, liquidity fees were applied to a suite of international enhanced cash funds. The funds in question were variably priced enhanced cash money market funds. But, accounting differences aside, we understand the funds applied a variable charge based on the estimated bid price of the assets.

Other proposals being considered by regulators are adopting variable net asset value pricing (VNAV) and adding capital buffers out of retained earnings

8. How does a liquidity fee compare with other reform proposals?

A number of other proposals have been made to reform MMFs. We focus here on the proposal to require 2a-7 funds to adopt a variable price, and the proposal to require 2a-7 funds to accumulate a 'capital buffer' out of retained earnings:

Requiring 2a-7 funds to adopt a variable price

It has been proposed that 2a-7 funds should be required to move from 'constant' to 'variable' pricing. This would require them to price their assets at market value (rather than amortised value) and to price their shares to a large number of decimal places (rather than two decimal places). Proponents of variable pricing have identified a number benefits, including that daily fluctuations in the price of variably priced funds would desensitise investors to losses, and therefore makes them less prone to redeem in a financial crisis. In our paper "Run risk in money market funds", we assess this proposal by comparing 2a-7 funds and European CNAV funds with French VNAV funds.

In summary, we find that, from an investor's perspective, there is no meaningful economic difference between CNAV and VNAV funds, and neither fund is more prone to runs than the other. Therefore, we recommend that regulators move on from the CNAV/VNAV debate, and focus instead on other mechanisms for reducing run risk.

Specifically, and as described above, we believe a liquidity fee would have a much greater impact on investor behaviour than requiring 2a-7 funds to convert from constant to variable pricing. The shares of variably priced funds automatically fall as prices deteriorate during a crisis, and so investors are incentivised to redeem in order to 'cut their losses'. This was shown in 2007, when investors redeemed en masse from variably priced enhanced cash money market funds. A liquidity fee, on the other hand, holds out the prospect of full recovery if investors don't redeem and the crisis passes.

Requiring 2a-7 funds to accumulate a capital buffer

It has been proposed that MMFs would be more robust if they had access to capital. Specifically, investors would have less cause to redeem from a MMF that had sufficient capital to offset losses realised during a market dislocation.

We are opposed to capital based solutions. In principle, the cost of accumulating sufficient capital to offset losses would cause the return from a MMF to equalise with that of a riskless asset, i.e. with a government security. But the objective of MMF investors is not to invest in government securities; if it were, then they would do so directly. Rather, the objective of MMF investors is to invest in prime issuers, and to manage the risk of loss through diversification. Put another way, MMF reform should not aim to eliminate the possibility of losses through capital based solutions, but rather aim to manage investor reaction to losses through disincentives to redemptions.

Furthermore, capital based solutions beg two key questions:

►First, who should provide the capital? Three alternatives have been proposed. Capital could be provided by MMF managers. We are opposed to this proposal since it fundamentally undermines the MMF as an investment product whose risks and rewards are borne by its investors; and it exacerbates investors' perception that MMF managers are 'obliged' to stand behind their funds. Alternatively, capital could be provided by a third-party, for example in the form of investors subscribing to a 'subordinated' share class. We are also opposed to this proposal, since it gives rise to complex conflicts of interest between investors in the subordinated shareclass, and investors in the MMF. Finally, capital could be provided by MMF investors, for example by retaining part of the income otherwise attributable to them in an escrow account, which would accumulate over time into a 'buffer' repayable to the fund in the event of a loss. This proposal would result in transfers of capital between different generations of investors, and so would need to be fully disclosed.

►Second, how much capital should be provided? The challenge here is to provide enough capital to meaningfully offset losses, without providing so much capital that the cost renders the MMF uncompetitive. Ultimately, in our opinion, this challenge is irresolvable. At best, we estimate that a relatively modest amount of capital might be accumulated over time from retained income, for example in the order of 40bps. In that case, the retained income might be regarded as a complement to a liquidity fee. They work together as 'carrot and stick': the capital buffer represents the benefit of remaining in the fund during a crisis; and the liquidity fee represents the cost of redeeming. Indeed, in combination they may mitigate the complaint that a 40bps capital buffer would be an insufficient amount. If these two reform options were combined, we recommend that the capital buffer should be excluded for the purposes of determining whether to implement a liquidity fee.

We believe that liquidity fees make redemptions less likely and enhance investor protection, whilst ensuring that risk remains with the investor rather than being externalised

Conclusion

To conclude, we recommend that 2a-7 funds should have language in their prospectus that requires the Board of Directors to decide whether to impose a liquidity fee if the mid-value per share falls below USD0.9975. We believe this would have a number of advantages:

A liquidity fee makes redemptions less likely. Specifically, since redemptions will be properly priced, investors will consider their needs more carefully; unless they believe that certain cost of the liquidity fee is less than the potential cost of remaining in a fund, then they will be unlikely to redeem.

A liquidity fee re-mutualises taking risk between investors by removing the 'first mover' advantage and eliminating the run dynamic.

A liquidity fee enhances investor protection, because even if investors do decide to redeem, their decision will be valued in such a way as to equalise remaining investors in the MMF.

Finally, a liquidity fee unambiguously ensures that the risks of investment remain with investors, and are not transferred on to the market, tax payers or fund managers.

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Run risk in Money Market Funds

"This paper suggests that whilst there are theoretical differences between CNAV and VNAV funds, for all practical purposes they behave in the same way during normal markets and during periods of market stress, and neither shows more propensity towards runs than the other."

3 November 2011

There is no meaningful economic difference between CNAV and VNAV funds, and neither fund is more prone to runs than the other

Summary

Since 2008, regulators and industry participants have been debating how to improve the soundness and continued viability of money market funds (MMFs¹). That debate has largely focussed on how to reduce 'run risk', i.e. the risk of large and systemically consequential redemptions from MMFs.

Some participants have proposed that constant net asset value MMFs (CNAV funds) pose greater run risk than variable net asset value MMFs (VNAV funds) and therefore recommend CNAV funds should be required to adopt a variable net asset value.

In this paper we assess that proposal by comparing the experience of US and European CNAV funds with French VNAV funds during the financial crisis.

In the interest of transparency, please note that HSBC Global Asset Management manages US and European CNAV funds, and French VNAV funds (and, indeed, MMFs domiciled in other countries around the world, which have a variety of pricing structures).

In summary, we find that from an investor's perspective, there is no meaningful economic difference between CNAV and VNAV funds, and neither fund is more prone to runs than the other. Therefore, we recommend that regulators consider alternative proposals for reducing run risk. As we have written in our paper "Liquidity fees – a proposal for MMF reform", we believe that run risk is best mitigated by empowering MMFs to impose a liquidity fee on redemptions during periods of market dislocation.

However, we do find that 'enhanced cash' funds pose greater run risk than regular MMFs. Therefore, we recommend that regulators should seek to agree a narrow, international definition of a MMF, and should prohibit any fund that is not a MMF from using expressions such as 'money market', 'cash', or 'liquidity' in its name. That would help to reduce 'contagion risk', i.e. the risk that runs from enhanced cash funds, could lead to runs from regular MMFs.

In the remaining part of this paper, we answer the following questions:
1. What are the theoretical differences between CNAV and VNAV funds?
2. What are the practical differences between CNAV and VNAV funds?
3. What causes investors to run from MMFs?

The share price of a VNAV fund ought (in theory) to be more variable than the share price of a CNAV fund, i.e. the capital component of the share price ought to fluctuate

1. What are the theoretical differences between CNAV and VNAV funds?

The expressions 'CNAV' and 'VNAV' are somewhat misleading, and therefore remain poorly understood. CNAV is often supposed to refer to a MMF that makes a promise or commitment to provide security of capital, whereas VNAV is often supposed to refer to a MMF whose share price regularly fluctuates in proportion to the market value of its underlying portfolio. Neither supposition is correct.

In an Appendix to this paper, we provide a detailed description of differences in the pricing mechanism of CNAV and VNAV funds. It shows that CNAV and VNAV funds have much more in common than is often thought. Both use amortised accounting to estimate market prices, although subject to different constraints. And both can offer accumulating and distributing shares, which can impact investors' impression of constancy and variability in the share price.

¹For the purposes of this paper, a MMF is defined as an investment fund, whose objective is to provide investors with security of capital and daily liquidity, and which seeks to achieve that objective by investing in a diversified portfolio of high quality, low duration money market instruments.

US-domiciled MMFs are regulated by Rule 2a-7 of the Investment Company Act of 1940. Rule 2a-7 imposes detailed obligations on MMFs.

EU-domiciled MMFs are regulated, at a European level, by the Undertakings for Collective Investments in Transferable Securities Directives (UCITS Directives). The UCITS Directives are broad pieces of legislation, which do not impose detailed obligations on MMFs, equivalent to Rule 2a-7. Therefore, in 2010, the Committee of European Securities Regulators (CESR, now succeeded by the European Securities and Markets Authority, ESMA) issued guidelines which sought to define MMFs more closely. However, CESR's definition of a 'short term' MMF remains significantly less detailed than Rule 2a-7, and envisages MMFs with both a constant and a variable NAV per share.

In the absence of a European definition of MMFs that is as detailed as Rule 2a-7, the Institutional Money Market Funds Association (IMMFA) maintains a Code of Practice, which is binding on its Members, and imposes obligations equivalent to 2a-7 on their EU-domiciled funds. In addition, certain Member States of the European Union impose detailed obligations on locally-domiciled MMFs, notably in France in relation to 'monétaire funds'.

Notwithstanding these similarities, the share price of a VNAV fund ought (in theory) to be more variable than the share price of a CNAV fund, i.e. the capital component of the share price ought to fluctuate. For that reason, it has been proposed that CNAV funds may be more prone to runs than VNAV funds. For example, in the USA the President's Working Group on Money Market Fund Reform has written²:

"[CNAV funds could have]... fostered investors' expectations that MMF shares are risk-free cash equivalents. When the Reserve Primary Fund failed to maintain those expectations in September 2008, the sudden loss of investor confidence helped precipitate a generalized run on MMFs.

By making gains and losses a regular occurrence, as they are in other mutual funds... [VNAV funds] could alter investor expectations and make clear that MMFs are not risk-free vehicles. Thus, investors might become more accustomed to and tolerant of NAV fluctuations and less prone to sudden, destabilizing reactions in the face of even modest losses."

Similarly, in France the Autorité des Marchés Financiers (AMF) has been critical of CNAV funds³. The AMF's position is particularly significant given its long experience of regulating a domestic VNAV MMF industry:

"The financial crisis has highlighted the systemic nature of money market funds. New regulation enacted in the US and in Europe now enables some risks to be mitigated, but the possibility of runs on these funds can not be ignored especially for Constant Net Asset Value (CNAV) funds. Moreover, Basle III implementation will lead banks to look more intensively for client deposits, at the expense of money market funds. These developments can have significant consequences for the fund management industry and for the short term financing of the economy."

(Translated from original French text)

What, then, are the practical differences between CNAV and VNAV funds, and do VNAV funds actually pose greater run risk?

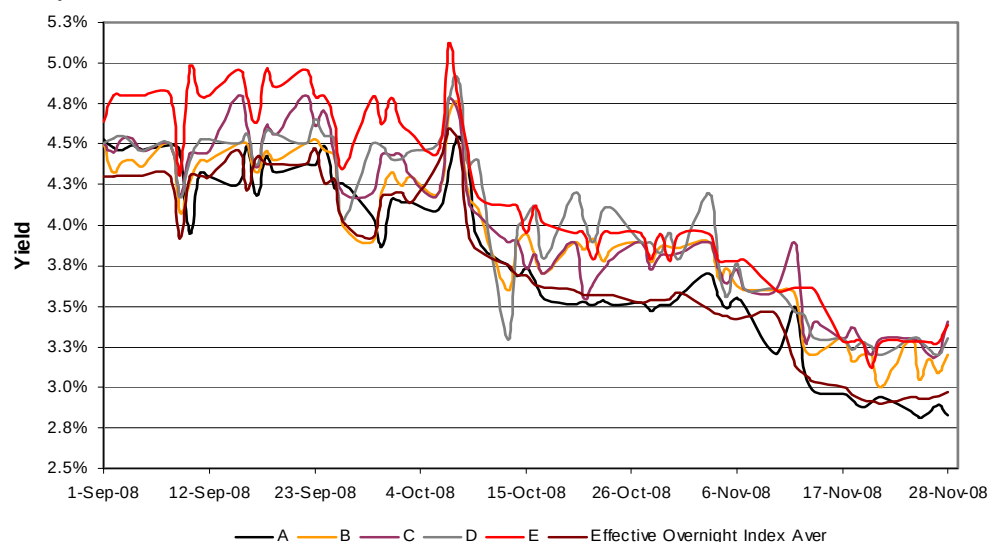
Only one of the VNAV funds in our sample posted a negative return over the last 5 years and both CNAV and VNAV funds experienced runs during the credit crisis

2. What are the practical differences between CNAV and VNAV funds?

From an investors perspective, is there any economic difference between an investment in a CNAV and VNAV fund?

We have sought to answer that question by looking at the actual variability of the share price of VNAV funds. Since the most developed market for VNAV funds is in France, we have looked at the share prices of six of the largest French VNAV 'monétaire' funds (as at June 2007) over a ten year period (from January 1999 to September 2009). Since these funds only offer accumulating shares, we assessed the variability of their share price by looking at the daily yield of the fund; a negative yield implies that the day's accumulation of income was more than offset by a mark-to-market loss. We estimated the daily yield by comparing the accumulated share price from one day to the next, and making adjustments for accumulations over weekends and Bank Holidays.

In the case of five of those six funds, at *no point* during the ten year period did they post a negative yield, i.e. daily mark-to-market losses were never substantial enough to cause the price of the funds to fall. This includes the period between September and November 2008 illustrated below, when markets were significantly dislocated. In other words, from an investor's perspective, these funds behaved much the same as if they were CNAV.



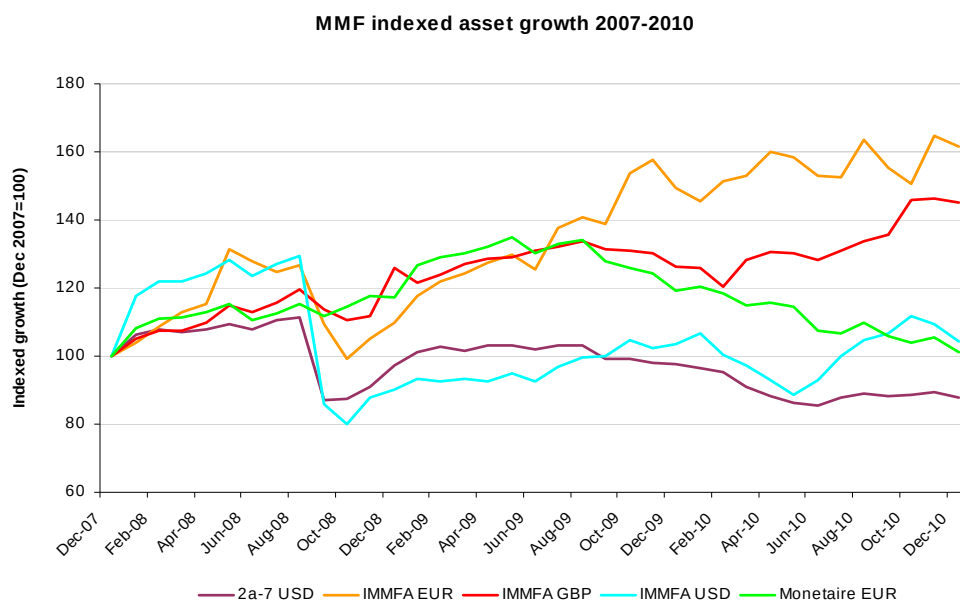
Source: Bloomberg

² <http://www.treasury.gov/press-center/press-releases/Documents/10.21%20PWG%20Report%20Final.pdf>

³ See also http://www.amf-france.org/documents/general/9998_1.pdf

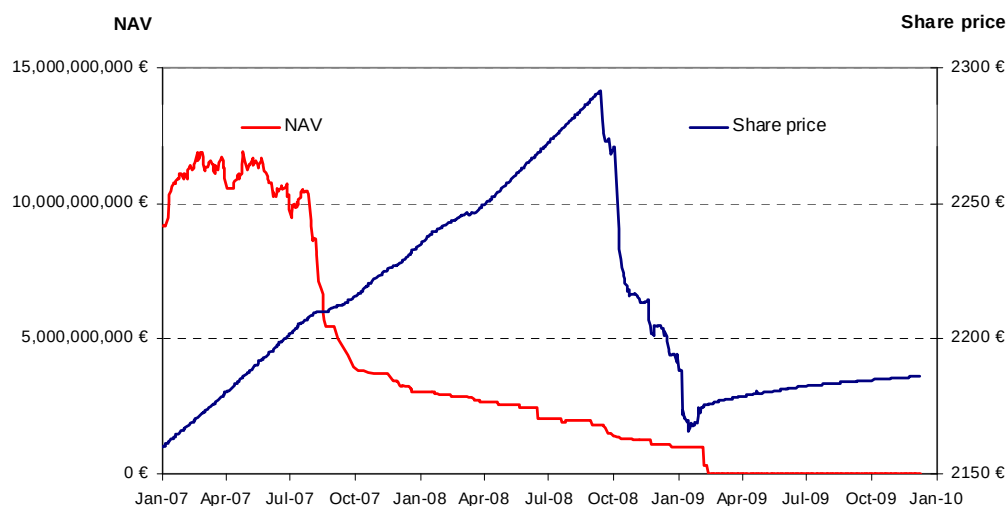
We also sought to assess whether CNAV funds posed greater run risk than VNAV funds, by comparing fund flows between 2008-2010. For the purpose of our analysis, CNAV funds comprised: 2a-7 prime funds; IMMFA USD funds; IMMFA EUR funds; and IMMFA GBP funds. VNAV funds comprised French monétaire funds.

We found that in 2008, run risk appears to be correlated by currency rather than by pricing mechanism: USD denominated MMFs suffered runs, whereas EUR and GBP denominated MMFs funds did not.



Source: iMoneynet, Europerformance

Furthermore, neither did we find that investors are more sanguine to losses in VNAV than CNAV MMFs. Of the six French VNAV monétaire funds we surveyed, one did post a negative yield in September 2008. Investors largely redeemed from that fund in the year before the decline in its share price, and what few shareholders remained in the fund redeemed after the decline in its share price. Either way, this fund clearly experienced a run notwithstanding that it was a VNAV fund.



Source: Bloomberg

In conclusion, we cannot find any evidence for the argument that there are substantial differences between CNAV and VNAV funds, which cause CNAV funds to be more prone to run risk than VNAV funds.

Investors are likely to run from a MMF if they have reason to believe it will fail to maintain principal value regardless of a funds moniker

3. What causes investors to run from MMFs?

The proposal to require CNAV funds to adopt a variable NAV is premised on VNAV funds being less susceptible to run risk. But why do investors run from MMFs?

In order to answer that question, one needs to understand (a) why investors subscribe to MMFs in the first place and (b) when they run, where they run to.

Investors subscribe to MMFs in order to manage credit risk, as described by the Institutional Money Market Funds Association (IMMFA):

"The cash assets of many investors (including, in particular, institutional investors such as corporate treasurers) are in excess of the amount guaranteed by deposit insurance schemes. Therefore, the deposits of such investors are exposed to the credit risk of their deposit bank.

Most institutional investors manage that credit risk by only depositing with an approved panel of banks, and up to an approved limit. Those approvals are set out in a 'treasury policy', and enable an institutional investor to preserve capital through diversification amongst strong counterparty credits. But there are resource constraints on the amount of diversification that an institutional investor can achieve on its own, including: credit resources (to distinguish relatively strong from relatively weak banks) and operational resources (to match the term of fixed deposits with the investors cash flow needs, and to roll those deposits). For many institutional investors, it makes sense to 'outsource' those credit and operational tasks via a MMF...

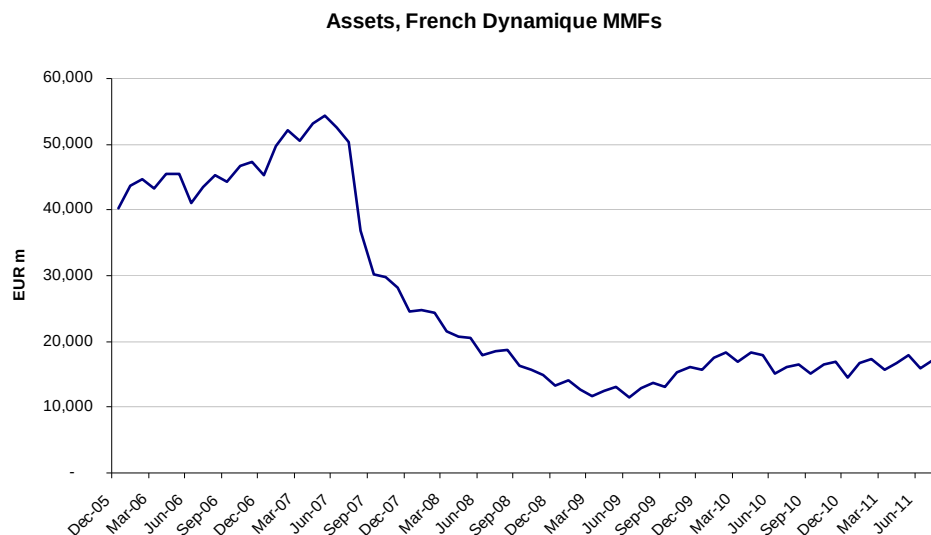
*In summary, then, MMFs are used by investors – and in particular by institutional investors – to meet their legitimate need to manage credit risk through diversification."*⁴

Whilst there is no guarantee that investors in a MMF will avoid losses, that is clearly their preferred outcome.

On this account, investors are likely to run from a MMF if they have reason to believe it will fail to maintain principal value. Since MMFs invest the substantial part of their assets in banks, and since banks were under extraordinary stress in September 2008 - particularly in the USA - investors redeemed for fear of suffering a credit loss.

In our opinion, it is implausible to suppose that investors would have been less likely to redeem if they have been normalised to the risk of loss by investing in a VNAV fund – and, for these purposes, let us assume a 'true' VNAV fund, i.e. whose share price, net of accumulated income, regularly fluctuates above and below par.

This can be seen in the runs experienced by 'enhanced cash' funds in 2007 and 2008. Enhanced cash funds take greater credit and/or duration risk than regular MMFs in exchange for greater yield, i.e. in principle, investors accept a greater risk of loss in exchange for higher long run returns. But in practice, when losses actually arise (i.e. when the share price becomes volatile, or in anticipation of such volatility) investors in enhanced cash funds tend to redeem. For example, and in the case of French dynamique funds:



Source: Europerformance

⁴ <http://www.immfa.org/press/responseFSB.pdf>

Investors' aversion to losses is also evidenced when one considers where they run to. Again, IMMFA's observations are helpful:

"It is also worth noting that a material amount of the money redeemed from prime 2a-7 MMFs was reinvested in treasury 2a-7 MMFs. In other words, there wasn't a run from MMFs per se; rather investors sought to 'switch' their exposure from prime MMFs to treasury MMFs."

This supports the observation that investors are highly risk averse: when they run, they reinvest their proceeds in – what they perceive to be – less risky assets, in the hope of avoiding losses. So, again, the supposition that they would be less likely to run if they had been normalised such losses seems doubtful, to say the least. Indeed, price fluctuations in a 'true' VNAV fund are likely to act as a signal to investors to redeem – particularly during a financial crisis.

Both CNAV and VNAV funds are susceptible to runs which are best managed by empowering MMFs to impose a liquidity fee on redemptions

Conclusion

We draw two conclusions:

- ▶ First, since there is no evidence to support the argument that CNAV funds are more susceptible to run risk than VNAV funds, regulators should consider alternative proposals for reducing run risk than requiring CNAV funds to float their NAV. As we have written in our paper "Liquidity fees – a proposal for MMF reform", we believe that run risk is best mitigated by empowering MMFs to impose a liquidity fee on redemptions during periods of market dislocation. Whereas movements in the share price of a 'true' VNAV fund would act as a signal to redeem, a liquidity fee would impose a cost on that redemption and so would directly disincentivise unnecessary redemptions.
- ▶ Second, since investors in MMFs and enhanced cash funds are ultimately both risk averse, and since enhanced cash funds are necessarily more risky than MMFs, it follows that enhanced cash funds pose greater run risk than MMFs. Therefore, we recommend that regulators should seek to agree a narrow, international definition of a MMF, and should prohibit any fund that is not a MMF from using expressions such as 'money market', 'cash', and 'liquidity' in its name. That would help to reduce the risk of runs from enhanced cash funds contaminating MMFs by association.

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APPENDIX

The pricing mechanism of CNAV and VNAV funds

We draw two conclusions:

In most respects, CNAV and VNAV funds are indistinguishable. Both are collective investment schemes, whose objective is to provide investors with security of capital and high levels of liquidity, and which seek to achieve that objective by managing a portfolio of high quality, low duration money market instruments. There is no guarantee they will achieve that objective, and so investors in either fund face a number of risks, including the risk of loss due to default in a fund's portfolio.

However, there are differences in the way those funds price their shares and value their portfolio, which has given rise to a convention of distinguishing 'CNAV' funds from 'VNAV' funds. Those differences comprise:

- ▶ Differences in share price rounding;
- ▶ Differences in the use of amortised accounting; and
- ▶ The impact of accumulating and distributing shares.

Differences in share price rounding

Like any other investment fund, the share price of a MMF is calculated by dividing its net asset value by the number of shares in issue: therefore increases or decreases in the net asset value of the fund, will cause increases or decreases in its share price. The precise relationship between the net asset value and the share price of a fund is determined by the degrees of significance to which its shares are priced. This is best illustrated by way of example.

Assume at T1 a newly formed MMF issues 100m shares upon receipt of an initial subscription of EUR100m, and invests the subscription in a diversified portfolio of short term, high quality money market instruments. Assume the NAV of the fund changes over time as shown below. Assume the fund receives no further subscriptions or redemptions during that period, and ignore income and expenses. Then depending on whether the fund prices its shares to six, four or two decimal places, and assuming they round to the nearest number, then they would increase/decrease as follows:

	NAV	6dps	4dps	2dps
T1	100,000,000	1.000000	1.0000	1.00
T2	99,999,990	1.000000	1.0000	1.00
T3	99,999,950	0.999999	1.0000	1.00
T4	99,995,000	0.999950	0.9999	1.00
T5	99,500,000	0.995000	0.9950	0.99

CNAV funds price their shares to two decimal places – a practice known as 'penny rounding'. As can be seen from the above example, penny rounded shares are sensitive to movements in the funds' NAV of 0.5% (or 50bps). Because it is rare for the NAV of a MMF to move by as much as 50bps, the share price of a CNAV fund tends to remain constant, hence the description of the fund as tending to have a 'constant' NAV. CNAV funds that fail to maintain a constant price are described as having 'broken the buck', as occurs at T5.

VNAV funds price their shares to more than two decimal places, and for that reason are more sensitive to movements in the funds' NAV. As can be seen from the above example, each additional decimal place causes a ten-fold increase in the sensitivity of the share price to changes in the NAV. This increased sensitivity means that the share price of a VNAV fund tends to be more variable.

In the case of both CNAV and VNAV funds, the tendency of their shares to be constant or variable depends on movements in the NAV.

Differences in the use of amortised accounting

Like any other investment fund, the NAV of a MMF is calculated on the basis of the mark-to-market value of its portfolio, which comprises high quality, short dated money market instruments. As money market instrument edge toward maturity, there is little-to-no profit to be made from trading them, and are largely held to maturity. Consequently, whereas equity and fixed income markets provide a wealth of mark-to-market prices, money markets do not. The lack of market prices is more pronounced in Sterling markets than Euro markets, and in Euro markets than US Dollar markets.

In the absence of regular and reliable mark-to-market prices, MMFs make use of 'amortised accounting' to estimate market prices. Amortised accounting assumes that money market instruments will mature at par, and any difference between their acquisition cost and par value should be realised on a straight-line basis between acquisition and maturity.

Amortised accounting generally produces a reasonable estimate of market price, except in two circumstances:

- ▶ First, sudden movements in interest rates can cause changes in the market price of money market instruments. MMFs manage interest rate risk by limiting the weighted average maturity (WAM, calculated as the weighted average interest rate reset period) of their portfolio and/or by using interest rate swaps to neutralise the impact of movements in interest rates on the market price of their portfolio.
- ▶ Second, changes in the credit quality – or the perceived credit quality - of issuers can result in changes in the market price of instruments they have issued. MMFs manage credit risk by employing credit analysts to distinguish relatively strong from relatively weak issuers. In addition, MMFs limit the weighted average life (WAL, calculated as the weighted average legal maturity) of their portfolio, and the final legal maturity of each instrument. By limiting their portfolio to instruments with a very short legal maturity, it is more likely that MMFs' holdings will mature at par – unlike investors who have longer-dated holdings, and are more fully exposed to credit risk. (This is the basis on which ratings agents distinguish short-term from long-term credit ratings.)

Notwithstanding their best efforts to manage interest rate and credit risk, there remains a risk that amortised price may not be an accurate estimate of market price. Therefore, the use of amortised accounting is conditional. For example, CESR's Guidelines Concerning Eligible Assets for Investment by UCITS says:

With respect to the criterion "value which can be accurately determined at any time", if the UCITS considers that an amortization method can be used to assess the value of a MMI [Money Market instrument], it must ensure that this will not result in a material discrepancy between the value of the MMI and the value calculated according to the amortization method. The following UCITS/MMI will usually comply with the latter principles:

▶ *MMI with a residual maturity of less than three months and with no specific sensitivity to market parameters, including credit risk; or*

▶ *UCITS investing solely in high-quality instruments with as a general rule a maturity or residual maturity of at most 397 days or regular yield adjustments in line with the maturities mentioned before and with a weighted average maturity of 60 days. The requirement that the instruments be high-quality instruments should be adequately monitored, taking into account both the credit risk and the final maturity of the instrument.*

These principles along with adequate procedures defined by the UCITS should avoid the situation where discrepancies between the value of the MMI as defined at Level 2 and the value calculated according to the amortization method would become material, whether at the individual MMI or at the UCITS level. These procedures might include updating the credit spread of the issuer or selling the MMI.

The first bullet in CESR's Guidelines accommodates the pricing practices of French VNAV funds, which apply amortised accounting to instruments with less than three months residual maturity. If the fund manager has any concerns about the credit quality of an issuer of an instrument with less than three months residual maturity, then some other estimate of its market price should be used.

The second bullet accommodates the pricing practices of CNAV funds, which apply amortised accounting to instruments with less than 397 days residual maturity, subject to ensuring this does not result in a 'material discrepancy'. In practice, a material discrepancy is assessed by comparing the amortised price of the portfolio with an alternative estimate of its market price. That alternative estimate comprises actual market prices where they are available, and model prices where they are not - for example, prices modelled off of an issuer's interest rate curve. That alternative estimate of the market price is called the 'shadow price'. If the shadow price differs by more than 0.5% (or 50bps) from the amortised price, then the CNAV fund abandons amortised pricing in favour of the shadow price. This is consistent with pricing its shares to two decimal places, as described above.

Research by the Investment Company Institute⁵ shows that the average shadow price of CNAV funds between 2000-2010 was well within the 0.5% (50bps) limit for using amortised accounting – even during the darkest days of September 2008.

Therefore, CNAV and VNAV funds both make use of amortised accounting to calculate their NAV, due to the lack of market prices at the very short end of the yield curve. The use of amortised accounting is subject to certain reasonableness checks, including the calculation of a shadow price in the case of CNAV funds. However, and due to the lack of market prices, the shadow price is partly made up of model prices.

The impact of accumulating and distributing shares

Like any other investment fund, MMFs can offer either accumulating or distributing shares. Distributing shares in MMFs make daily declarations of net income (and, usually, make monthly distributions) whereas accumulating shares retain net income within the fund, which manifests as an increase in its NAV and therefore in its share price.

Investors' preference for distributing or accumulating shares is driven by a combination of taxation issues (i.e. whether investors have a tax-driven preference for income or for capital gains) and operational issues (i.e. whether investors find it convenient/inconvenient to process the receipt of income). Very crudely, Anglo-Saxon investors tend to prefer distributing shares, whereas Continental European investors tend to prefer accumulating shares.

EU-domiciled⁶ CNAV and VNAV funds may offer both distributing and accumulating shares. This impacts the tendency of those shares to maintain either a constant or a variable price. This is best illustrated by example.

Assume a CNAV and a VNAV fund each offer both distributing and accumulating shares, and have 100m shares in issue. Assume that the NAV of the funds (gross of income) changes between T1 and T5 as shown below, and all of that change is attributable to instruments with more than three months residual maturity. (Therefore: changes in the NAV fully impact the share price of the VNAV fund; but since the NAV never changes by as much as 0.5% (50bps), the share price of the CNAV fund is based on amortised pricing throughout. This somewhat artificial assumption means that, over the period, shares in the CNAV fund will be constant, whereas shares in the VNAV fund will be variable.) Assume that the annualised yield of the funds is 2%, which results in net income of EUR5,000 per day. (Therefore: distributing shareholders will enjoy a daily declaration of income; whereas accumulating shareholders will experience a daily increase the share price by an equal amount.) Assume further that the shares of the VNAV fund round to six decimal places, as do the accumulating shares of the CNAV fund. Then the share price of those funds will be as follows:

	NAV	CNAV Fund		VNAV Fund	
		Distributing	Accumulating	Distributing	Accumulating
T1	100,000,000	1.00	1.000050	1.000000	1.000050
T2	99,999,000	1.00	1.000100	0.999990	1.000090
T3	99,950,000	1.00	1.000150	0.999500	0.999650
T4	99,940,000	1.00	1.000200	0.999400	0.999600
T5	99,980,000	1.00	1.000250	0.999800	1.000050

This example illustrates three points:

►First, the accumulating shares of a CNAV fund have a variable price! However, the variability is solely due to the daily accrual of net income. In an economic sense (i.e. net of income) those accumulating shares still tend to have a constant price.

►Second, accumulating and distributing shares in a VNAV fund are variable to differing degrees! Again, that is solely due to the daily accrual of net income in the case of accumulating shares. In an economic sense, accumulating and distributing shares in a VNAV fund provide the same total return.

►Third, and focussing on behavioural (as opposed to economic) issues: accumulating shares 'appear' to be less volatile.

⁵ http://www.ici.org/pdf/ppr_11_mmf_pricing.pdf

⁶ US-domiciled MMFs only offer distributing shares, due to taxation issues.

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