

IMMFA

INSTITUTIONAL MONEY MARKET FUNDS ASSOCIATION

The Institutional Money Market Funds Association (IMMFA) represents managers of EU-domiciled, constant net asset value money market funds. IMMFA's Members are bound by a Code of Practice (which can be found on our website) whose objective is to protect investors by imposing high and consistent standards on IMMFA funds. All IMMFA Funds meet the European Securities and Markets Authority's definition of a 'short-term money market fund'; therefore, all references in this paper to a 'money market fund' are references to a short-term money market fund.

The use of amortised cost accounting by money market funds

Much of the recent debate about money market funds (MMFs) has focused on the purported advantages of variable net asset value (VNAV) funds over constant net asset value (CNAV) funds.

Yet CNAV and VNAV funds share much in common.

Both are collective investment schemes, the objective of which is to provide investors with security of capital and high levels of liquidity, and which seek to achieve that objective by investing in a portfolio of high quality, low duration money market instruments. If a CNAV or VNAV fund meets its objective – which it usually does - then a redeeming investor will receive repayment of their original investment plus an income return which reflects the prevailing rate in the money markets. If a CNAV or VNAV fund does not meet its objective - and there is no guarantee that it will - then a redeeming investor may not receive full repayment of her original investment, even net of the income return, perhaps due to a default by one of the fund's underlying portfolio investments.

Despite these fundamental similarities, the convention of distinguishing CNAV and VNAV funds persists, in particular because some regulators have argued that CNAV funds pose greater risks than VNAV funds. They have therefore proposed restrictions on the mechanisms that CNAV funds use to maintain a constant price, including the use of amortised cost accounting to value their assets¹.

The objectives of this paper are to:

- explain why MMFs use amortised cost accounting;
- assess the risks arising; and
- explore potential remedies.

In summary, in the absence of traded or quoted prices, amortised cost accounting is a pragmatic way for MMFs to evaluate the fair value of money market instruments. Amortised cost accounting is widely used in the EU (where it is often used as a proxy for fair value) and in the financial statements of MMFs in the USA (and has been accepted by the Financial Accounting Standards Board as compliant with generally accepted accounting principles). Amortised cost accounting (and equivalent valuation techniques) is also used in the financial statements of banks to value loans and certain other assets.

Nevertheless, securities regulators remain concerned that amortised cost accounting might not always be a good estimate of fair value (perhaps due to changes in interest rates or credit worthiness) and might therefore cause a disadvantage to investors in MMFs. For example, if an investor redeems when fair value is lower than

¹ For example, the International Organisation of Securities Commissions (IOSCO) recently recommended limiting the use of amortised cost accounting, www.iosco.org

amortised cost, then the fair value per share will deteriorate as a consequence of the redemption at the expense of remaining investors, and potentially to the point where a CNAV fund will no longer be able to maintain a constant price, i.e. it will ‘break the buck’. They propose that in a worse-case scenario, this might incentivise all investors to redeem first, i.e. CNAV funds might be subject to increased run risk due to their use of amortised cost accounting.

In this paper, we note a number of regulatory reforms that have materially reduced interest rate and credit risk in MMFs, and therefore reinforced the reasonableness of amortised cost as a proxy of fair value.

More importantly, we also note that the disadvantage to investors in MMFs due to any discrepancy between amortised cost and fair value is typically less significant than the disadvantage to investors in other types of investment funds which value their assets at mid-price, due to differences between bid and offer prices. In any event, in both cases such disadvantages are – with few exceptions – not material. And even if a material disadvantage were to arise, the simplest and most effective remedy would not be to prohibit amortised cost accounting by MMFs, or mid-pricing by other investment funds, but rather to empower all funds to impose an equalisation payment on subscribing or redeeming investors. This might take the form of a ‘swinging price’, or, in the case of a MMF, a trigger based liquidity fee, which would enable the MMF to impose a levy to ensure fair treatment of redeeming/remaining investors during a financial crisis.

How do MMFs price their shares?

The price of a share in an investment fund, including a MMF, is a function of the value of its assets. Securities regulators have a strong presumption in favour of valuing assets at their mark-to-market prices², since this ensures the fair treatment of investors. For example, if an investment fund valued its assets *above* market prices and received a large redemption, then the redemption would be funded by selling assets at market prices, which would cause a dilution of remaining investors’ interests relative to redeeming investors. *Vice versa*, if assets were valued *below* market prices, then redemptions would cause a concentration of remaining investors. By contrast, if assets were valued at market prices, then no such dilution or concentration would occur³.

How, then, do investment funds identify market prices in order to value their assets?

The market price of some assets can be identified as the last price at which they traded on an exchange. For example, stock exchanges provide a wealth of traded prices for equities, which are public and auditable. Other assets are not traded on an exchange, but ‘over the counter’ or ‘over the wire’ by brokers. For example, bonds are often traded directly with brokers, and so are valued using broker quotes rather than traded prices. Other assets are infrequently traded on an exchange or with brokers, in which case the last traded price or broker quote might be stale. Therefore, in the absence of traded or quoted market prices, investors *evaluate fair prices* using various models. For example, investors typically hold money market instruments to maturity, and so there are relatively few prices from the secondary market or broker quotes^{4,5}. This is more pronounced in Euro money markets than Sterling markets; in Sterling markets than US Dollar markets; and in US Dollar prime markets than in US Dollar Treasury markets.

² For example, IOSCO says: “Where possible, assets should be valued according to current market prices...”, see “Principles for the Valuation of Collective Investment Schemes”, Consultation Report, February 2012, www.iosco.org

³ In fact, small dilutions arise even when using market prices due to bid-offer spreads, as discussed later in this paper.

⁴ The objective of most investors in money market instrument is to achieve security of capital. The MM fund managers aim to achieve the yield payable on the securities and are not aiming to profit from the relative price movements between different securities. At such short maturities, there is usually very little fluctuation in the relative value of different instruments. Therefore, they rarely sell money market instruments before maturity (unless, for example, they have reason to believe a money market issuer is about to default, or have an unexpected need for cash). This does not mean that money markets are illiquid; indeed, the buy side of secondary money markets is very liquid. There is no particular challenge finding a buyer for a high quality certificate of deposit with one week to mature; rather, the owner of such a CD is unlikely to be a seller.

⁵ “A Floating NAV for Money Market Funds: Fix or Fantasy?”, Fisch and Roiter, University of Pennsylvania, August 2011, www.papers.ssrn.com

To evidence the lack of traded prices for money market instruments, we asked two large fund administrators (A and B) to estimate the typical split of traded, quoted and evaluated prices used by pricing vendors to value the assets of an equity fund, a bond fund and a prime money market fund:

Fund Administrator A ⁶	Equity fund	Bond fund	USD prime MMF	EUR prime MMF	GBP prime MMF
Traded price	100%	0%	0%	0%	0%
Quoted price	0%	25%	0%	0%	0%
Evaluated price	0%	75%	100%	100%	100%

Fund Administrator B	Equity fund	Bond fund	USD prime MMF	EUR prime MMF	GBP prime MMF
Traded price	98%	0%	0%	0%	0%
Quoted price	2%	20%	10%	10%	10%
Evaluated price	0%	80%	90%	90%	90%

To further evidence the lack of traded or quoted prices in money markets, we looked at the prices used in the financial statement of MMFs. Specifically, EU-domiciled and listed MMFs are required to prepare their financial statements under International Accounting Standards, and to value their assets according to the 'fair value hierarchy' set out in International Accounting Standard 39 (IAS39), i.e.:

- Level one, comprising unadjusted quoted prices in active markets that are accessible at the measurement date for identical unrestricted assets or liabilities;
- Level two, comprising inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (as prices) or indirectly (derived from prices); and
- Level three, comprising inputs for the asset or liability that are not based on observable market data (unobservable inputs).

Data on the use of level one, two and three prices of six MMFs supports the claim that traded or quoted prices (level one) are rarely available:

	Fund A	Fund B	Fund C	Fund D	Fund E	Fund F
Call deposits	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Certificates of deposit	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Commercial paper	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Repo	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Time deposits	Level 2	Level 2	Level 2	Level 2	Level 2	Level 2
Treasury bills	Level 1	Level 1	Level 1	Level 1	Level 1	Level 1

How do MMFs evaluate fair prices?

In the absence of traded or quoted prices, MMFs can evaluate the fair price of their assets in a number of ways, including:

- Yield curve pricing;
- Discounted cash flow pricing; and
- Amortised cost accounting.

Yield curve pricing

The traded or quoted prices of the *long-term* paper of an issuer can be used to evaluate the fair price of its *short-term* paper. This is known as yield curve pricing.

⁶ Fund Administrator A noted: "It is difficult for us to differentiate if vendor prices sourced from FTID for example are based on quotes from market makers as we do not get this level of transparency from them. As such apart from certain Bloomberg contributor prices, IBOX and GEMMA levels, which we know are calculated based on actual market quotes, we would consider fixed income vendor prices to be predominantly in the evaluated bucket."

Yield curve pricing makes a simplifying assumption: that the credit risk of long-term paper is equivalent to that of short-term paper. Although that assumption is false, its impact is largely immaterial in benign markets when credit spreads tend to be modest. However, when markets become dislocated and the spread between short-term and long-term credit risk widens, yield curve pricing effectively ‘contaminates’ the evaluation of short-term prices with price deterioration at the long end of the curve. For that reason it is a poor proxy of fair price. It is also pro-cyclical, i.e. it can exacerbate a financial crisis to the extent that it over estimates price deteriorations during such crises and investors react negatively to such over estimates.

Discounted cash flow pricing

The future cash flows of a money market instrument can be discounted to calculate its net present value, and used as an evaluation of its fair price.

Discounted cash flow pricing is a reasonable evaluation of the fair price, insofar as a sensible discount rate is used. Typically, the discount rate is that of an issuer of equivalent credit quality issuing over an equivalent period, or else a standard benchmark (one month LIBOR, three month LIBOR etc). It is inevitable that the selection of the discount rate introduces an element of approximation into DCF calculations. Notwithstanding those approximations, IAS39 explicitly authorises the use of discounted cash flow pricing as a means of evaluating fair price.

Cost and amortised cost accounting

Cost accounting assumes that a money market instrument, purchased upon issuance and held until maturity, should be priced at cost. Amortised cost accounting assumes that a money market instrument, acquired after issuance and held until maturity, should be priced at its acquisition cost and any difference between its acquisition cost and par value should be realised on a straight-line basis between acquisition and maturity.

Since MMFs overwhelmingly hold assets to maturity⁷, they make extensive use of cost and amortised cost accounting.

To illustrate this point, we asked two large fund administrators to calculate the value of paper held to maturity and the value of paper sold before maturity for *each year between 2006-2011* by individual fund. Their data shows that, on average, the annual value of sales before maturity is just 0.327% of the annual value of maturities:

	Fund A € millions		Fund B £ millions		Fund C € millions		Fund D € millions		Fund E € millions		Fund F £ millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006	155	22,974	317	51,620	540	135,719	64	14,291	596	26,312	1,065	272,093
2007	208	67,623	598	95,457	542	179,767	59	13,380	103	13,160	2,660	442,899
2008	330	104,713	369	124,343	171	191,312	31	9,920	8	16,974	9,459	495,737
2009	23	123,014	185	134,694	45	304,534	5	13,026	-	19,374	4,834	556,501
2010	379	177,987	111	128,110	233	647,024	9	16,647	35	37,404	4,092	866,677
2011	234	240,518	42	117,530	366	1,009,447	350	281,246	51	54,317	1,691	1,188,271

	Fund G \$ millions		Fund H € millions		Fund I \$ millions		Fund J \$ millions		Fund K \$ millions		Fund L € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	48	937,473
2009	70	51,104	10	29,972	185	270,820	73	494,061	0	144,228	33	624,147
2010	24	48,590	0	45,125	868	486,257	357	161,299	62	228,721	45	1,236,247
2011	659	70,617	13	16,919	734	358,748	665	125,777	102	219,296	38	793,805

⁷ It should come as no surprise that MMFs are classic ‘hold to maturity’ investors. IOSCO defines a MMF as “an investment fund that has the objective to provide investors with preservation of capital and daily liquidity, and that seeks to achieve that objective by investing in a diversified portfolio of high-quality, low duration fixed-income instruments.” Given that definition, it is clear that neither CNAV nor VNAV funds have an interest in selling instruments before maturity, either to crystallize a gain or to mitigate a (temporary) mark-to-market loss.

The use of amortised cost accounting by money market funds

	Fund M £ millions		Fund N \$ millions		Fund P € millions		Fund Q £ millions		Fund R \$ millions		Fund S € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006												
2007					467	83,971	275	50,149	467	297,476	157	18,281
2008	31	822,265	7	203	778	25,081	295	42,277	575	71,964	25	28,313
2009	291	2,782,373	1	533	75	70,288	31	56,714	60	118,637	71	13,186
2010	1,356	6,499,030	81	1,685	117	48,928	27	20,652	992	200,517	98	66,212
2011	4,233	12,065,296	120	2,255	36	62,503	102	23,366	3,383	224,384	511	56,335

	Fund T £ millions		Fund U € millions		Fund V £ millions		Fund W \$ millions		Fund X € millions		Fund Y € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006												
2007	5,445	115,448	513	44,238	748	79,610	4,152	451,915			122	29,537
2008	1,273	128,294	1,613	162,957	2,068	152,991	13,246	910,155	0	2,020	31	41,366
2009	1,628	149,104	3,886	218,358	2,114	231,372	2,915	1,152,926	0	39,463	187	46,550
2010	2,100	189,815	6,416	415,645	4,723	160,198	1,596	1,432,253	65	42,743	224	68,599
2011	3,664	173,916	5,874	465,446	4,488	265,593	3,069	1,287,926	2	43,330	332	139,974

	Fund Z £ millions		Fund AA £ millions		Fund BB \$ millions		Fund CC € millions		Fund DD £ millions		Fund EE \$ millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006												
2007			26	155,453	402	104,119	149	52,309	264	70,918		
2008			193	225,594	213	154,753	417	44,503	518	57,092	27	38,746
2009	0	38,497	70	225,437	101	124,005	383	46,887	550	65,711	95	82,059
2010	0	19,275	786	272,397	448	92,807	393	44,794	412	56,183	156	51,882
2011	0	19,782	801	368,784	273	174,302	367	39,659	465	38,089	30	41,826

	Fund FF \$ millions		Fund GG € millions		Fund HH € millions		Fund JJ £ millions		Fund KK £ millions		Fund LL \$ millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
2006												
2007	162	336,346	4,327	360,085			632	176,450			1,498	2,578,886
2008	3,477	273,556	1,574	953,742	37	135,963	347	418,424			10,825	3,631,894
2009	1,369	96,354	1,954	886,589	1,920	396,399	1,041	417,499	0	3,649	7,986	1,879,328
2010	584	165,843	2,712	1,097,077	1,282	302,017	1,579	338,491	6	36,496	7,593	2,663,294
2011	801	170,690	2,734	1,280,319	53	259,895	814	419,823	0	252,459	7,379	2,731,640

	Fund MM \$ millions	
	Sales	Maturity
2006		
2007		
2008	20,218	1,487,977
2009	33,285	1,903,389
2010	19,752	1,655,872
2011	17,384	2,356,054

The data represents all the MMF administered by the two firms in question for which data were available. No pre-selection or optimisation has taken place.

The average figures by year (all converted to EUR) are as follows:

million	Assets resold	Assets matured	% resold
2006 (6 funds)	3,026	590,610	0.510%
2007 (23 funds)	24,493	5,180,656	0.471%
2008 (30 funds)	60,167	10,665,796	0.561%
2009 (37 funds)	57,066	13,239,484	0.429%
2010 (37 funds)	55,155	20,016,109	0.275%
2011 (37 funds)	57,078	28,554,378	0.199%
Overall			0.327%

The use of amortised cost accounting by money market funds

The data above shows a significant increase in the value of maturities relative to the value of sales before maturity between 2006 and 2011. This increase is due to an amendment to the IMMFA Code of Practice in 2009/10, requiring that Members' funds should hold a minimum of 10% of assets maturing overnight, and 30% maturing within one week (which mirrors a similar amendment to US Regulation). The objective of the minimum liquidity requirement is to enable MMFs meet redemption payments using cash arising from natural maturity, rather than cash arising from sales in secondary markets. The minimum liquidity requirement addresses the fact that secondary markets (notably the interbank market) became largely illiquid in September 2008, and therefore might not be a reliable source of cash during a future financial crisis.

We also asked the fund administrators to calculate the value of paper held to maturity and the value of paper sold before maturity for *each month between April 2008-May 2009*. Their data show that, on average, the monthly value of sales before maturity are just 0.78% of the monthly value of maturities, i.e. the financial crisis resulted in only a minor increase in the value of sales relative to the value of maturities. This is unsurprising; EU MMFs, including CNAV funds, did not experience redemptions of the same magnitude as US MMFs, and therefore there was no need to sell assets before maturity to fund redemption payments:

	Fund A millions		Fund B € millions		Fund C € millions		Fund D € millions		Fund E € millions		Fund F € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
Apr/08	35	9,378	50	12,997	-	16,435	-	982	-	1,639	598	35,841
May/08	-	7,371	-	8,454	-	13,844	22	697	-	1,420	602	32,778
Jun/08	-	7,041	49	7,271	-	12,141	-	519	-	1,669	766	34,691
Jul/08	-	5,500	-	6,973	10	17,376	-	830	-	1,635	1,003	41,836
Aug/08	-	2,518	-	5,795	-	17,434	-	652	8	1,368	613	37,946
Sep/08	-	7,711	20	9,110	102	18,252	-	829	-	1,231	584	38,733
Oct/08	30	16,213	2	15,474	38	17,726	-	1,060	-	1,305	876	45,194
Nov/08	25	13,732	-	13,200	15	14,120	-	786	-	1,190	2,461	52,220
Dec/08	225	9,376	159	11,052	-	13,783	-	883	-	1,305	1,150	54,607
Jan/09	-	8,343	50	7,749	-	18,841	-	998	-	1,530	1,262	50,017
Feb/09	-	6,216	-	7,958	-	20,246	-	1,007	-	1,504	399	35,911
Mar/09	-	10,749	-	8,408	-	22,164	-	1,170	-	1,568	348	34,145

	Fund G € millions		Fund H € millions		Fund J \$ millions		Fund J € millions		Fund K € millions		Fund L € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
Apr/08	0	37	0	10	0	0	0	1427	150	4483	30	8349
May/08	0	196	0	63	0	0	0	1473	0	6422	115	7273
Jun/08	0	89	3	59	0	0	25	1782	50	6621	0	11192
Jul/08	26	98	11	61	0	0	0	2725	0	9752	239	13465
Aug/08	15	53	4	43	1	43	0	2144	0	7962	395	8987
Sep/08	7	78	2	103	0	40	0	2939	0	8072	653	14153
Oct/08	0	194	3	206	0	49	0	3416	40	11336	134	29833
Nov/08	0	133	6	166	3	48	0	2971	0	11416	48	20353
Dec/08	0	59	2	112	2	23	0	2229	81	13999	0	22750
Jan/09	3	50	14	141	1	34	0	2136	360	14091	80	22762
Feb/09	4	60	0	133	0	25	0	1630	83	11508	202	18019
Mar/09	0	53	24	191	0	15	0	1613	272	15601	170	21334

	Fund M € millions		Fund N \$ millions		Fund P € millions		Fund Q € millions		Fund R € millions		Fund S \$ millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
Apr/08	0	8304	100	57744	0	2312	0	0	0	14123	0	15304
May/08	0	7990	500	59654	0	1381	0	0	0	10970	5	12687
Jun/08	0	8078	649	52494	0	3214	0	0	0	15772	0	11660
Jul/08	220	9558	150	43023	0	3327	0	0	0	14766	0	12607
Aug/08	433	10103	0	46604	0	2273	0	0	0	13900	0	12682
Sep/08	589	10844	5815	58383	0	3037	0	0	20	19201	0	11776
Oct/08	427	20139	1138	177870	2	7463	0	0	75	28966	170	8379
Nov/08	400	23792	992	119132	3	5330	0	0	50	30511	0	11646
Dec/08	0	28111	1806	140874	7	4297	0	2020	0	31795	12	16252
Jan/09	129	20104	1503	146927	130	4191	0	2476	0	21835	0	17722
Feb/09	0	25317	750	129005	1	2181	0	1648	0	14128	0	9344
Mar/09	269	28584	100	106398	0	2998	0	1989	0	24320	0	8516

	Fund T € millions		Fund U € millions		Fund V \$ millions		Fund W \$ millions		Fund X € millions		Fund Y € millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity	Sales	Maturity
Apr/08	0	3631	30	4512	0	31583			0	96088	0	178
May/08	0	3925	50	5120	0	25440			150	91663	0	197
Jun/08	0	3425	55	5119	0	25388			479	84564	0	192
Jul/08	29	4227	80	5676	25	26175			50	73393	0	274
Aug/08	65	3028	0	4177	0	24041	0	1401	149	60268	0	372
Sep/08	104	3150	75	3786	1021	18101	0	6089	449	71619	0	7202
Oct/08	0	3773	40	4584	465	8302	2	11447	99	87945	0	48254
Nov/08	99	3644	119	2695	1603	10440	25	9007	49	84523	0	41388
Dec/08	119	4034	40	2801	199	10724	0	10802	0	97954	37	37906
Jan/09	90	4602	100	4759	280	7269	0	8509	0	77396	35	33375
Feb/09	34	3463	50	4875	0	8693	95	5965	0	74249	0	40308
Mar/09	0	4501	5	6437	280	9249	0	6603	0	74871	62	43939

	Fund Z € millions		Fund AA \$ millions		Fund BB \$ millions	
	Sales	Maturity	Sales	Maturity	Sales	Maturity
Apr/08	0	400	330	339745	0	54171
May/08	0	31519	0	352359	0	155251
Jun/08	55	33509	0	363597	342	145223
Jul/08	0	32875	0	388082	3014	184190
Aug/08	0	33446	0	300656	352	174823
Sep/08	50	36990	8309	251496	2693	180790
Oct/08	50	47057	1346	156822	8517	204880
Nov/08	30	46248	540	183598	1979	204294
Dec/08	90	47705	0	176436	3321	184356
Jan/09	50	42478	0	138139	3119	153823
Feb/09	0	32727	0	148291	3876	173736
Mar/09	75	41265	0	192813	5073	211707

Aggregated data for 27 funds (converted to EUR):

million	Assets resold	Assets matured	% resold
Apr/08	1,392	623,927	0.22%
May/08	1,465	722,854	0.20%
Jun/08	2,446	723,122	0.34%
Jul/08	4,403	775,849	0.56%
Aug/08	2,166	669,576	0.32%
Sep/08	16,751	690,849	2.37%
Oct/08	11,140	865,057	1.27%
Nov/08	7,904	821,807	0.95%
Dec/08	6,354	843,182	0.75%
Jan/09	6,497	736,528	0.87%
Feb/09	4,539	698,064	0.65%
Mar/09	5,651	792,886	0.71%
Overall	70,708	8,963,701	0.78%

Given the clear intention and tendency of MMFs to hold assets to maturity, both CNAV and VNAV funds make use of amortised accounting to calculate their NAV and price their shares.

We note that both the AMF and the SEC specifically approved the use of amortised cost accounting for MMF as a proxy of fair value during the financial crisis in 2007/8.

We also note that in both the EU and the USA, the financial statements of MMFs make use of amortised cost accounting. In the USA the use of amortised accounting has been reviewed by the Financial Accounting Standards Board and accepted as compliant with generally accepted accounting principles⁸. In the EU, IAS39 does not permit the use of amortised cost accounting (since it is a historic measure of price). However, insofar as amortised cost accounting is materially the same as an evaluation of fair value using discounted cash flows etc, then it is used as a proxy for such.

Finally, we note that IAS39 requires banks to use amortised cost accounting to price loans and other assets held to maturity in their 'banking book'. Furthermore, the International Accounting Standards Board has proposed amendments to IFRS9 which would enable the use of amortised-cost-accounting-like valuation for instruments held to maturity, and classified as 'fair value through comprehensive income'⁹.

What are the risks associated with amortised cost accounting?

As described above, amortised cost accounting is a reasonable way of evaluating the fair value of money market instruments, and, in certain instances, is authorised by accounting standards or is used as a proxy for fair value specified by accounting standards. Nonetheless, securities regulators remain anxious. For example, IOSCO says:

"IOSCO acknowledges that amortised cost accounting may provide an accurate estimate of market price for certain short-term instruments, assuming that they will mature at par. However, sudden movements in interest rates or credit concerns may cause material deviations between the mark-to-market price and the price calculated using the amortisation method. In addition to the risk of mispricing of individual instruments, the use of amortised cost accounting could create opacity for investors regarding the actual net asset value of the funds. Accordingly, the use of amortised cost accounting should be subject to strict conditions and monitoring."

We acknowledge that since a sudden change in interest rates would not cause any change in the amortised cost of a money market instrument, then it might result in a discrepancy between the amortised cost and the 'fair value' adjusted for interest rate risk. We also acknowledge that since changes in the credit quality – or the perceived credit quality - of an issuer would not cause any change in the amortised cost of a money market instrument, then it might also result in a discrepancy between the amortised cost and the 'fair value' adjusted for credit risk.

However, we note that MMF regulation has already reduced interest rate and credit risk, by shortening the absolute and average final maturity of MMFs' portfolios. For example, in the EU and the US, MMFs are now subject to:

⁸ "Amortized Cost Is 'Fair' for money Market Funds", Dennis R. Beresford, 2012, www.centerforcapitalmarkets.com

⁹ IAS39 requires that certain other assets which are not classified as (a) loans and receivables, (b) held-to-maturity investments or (c) financial assets at fair value through profit or loss are classified as 'available for sale' (AFS), which are held at fair value on the balance sheet, with fair value movements recognised in reserves. In effect, this means held-to-maturity investments have the same impact on the profit and loss account as loans valued using amortised cost accounting, insofar as changes in value are recognised in reserves rather than in the profit and loss account. IAS39 includes so-called 'tainting rules' which effectively make it impractical to account for assets as held-to-maturity, due to the strict rules surrounding this classification. The International Accounting Standards Board has proposed amendments within IFRS 9 (the revised financial instruments standard) which, amongst other things, remove the tainting rules and creates a 'fair value through other comprehensive income' category, which is similar to the AFS category (although there are differences in the treatment of impairment).

- A maximum weighted average maturity of 60 days;
- A maximum weighted average life of 120 days;
- A maximum final maturity of 397 days.

In addition, in order to further increase their ability to generate cash through natural maturity rather than sales in the secondary markets, a minimum of 10% of the portfolio of US MMFs is required to mature overnight, and 30% to mature in one week. The EU does not currently impose minimum liquidity requirements, although EU MMFs which are subject to IMMFA's Code of Practice are required a minimum of 10% to mature overnight, and 20% mature in one week.

We also understand that some MMFs – in particular, in France – make extensive use of interest rate swaps to manage interest rate risk.

Notwithstanding these efforts to reduce interest rate and credit risk, discrepancies might still arise between the amortised cost and the 'fair value' adjusted for movements in interest rates and credit quality. IOSCO describes these discrepancies as a source of concern for financial stability:

"...the discrepancy between the net asset value published and the value of the assets, due to the use of amortised cost accounting and rounding methods. Even though money market funds will generally exhibit strong price stability, the absence of reference to market prices creates uncertainty for investors and may increase run risks."

This is an important argument, worth illustrating by way of an example:

At T_0 , a newly incorporated CNAV MMF receives a subscription of USD1,000 and uses those proceeds to purchase money market instruments. At T_1 , due to changes in interest rates or credit quality, the 'fair value' of those instruments (evaluated using, say, a discounted cash flow) is estimated to fall to USD998. At T_2 , 50% of investors redeem their shares, receiving subscription proceeds of USD500.

If the fund prices its assets using amortised cost accounting, then the published price of the fund remains constant at USD1.00. However, the 'fair value' per share falls from USD0.998 at T_1 ($998/1,000$) to USD0.996 at T_2 (i.e. $(998 - 500) / 500$).

In other words, if investors redeem when fair value is lower than amortised cost, then the fair value per share will deteriorate as a consequence of the redemption at the expense of remaining investors, potentially to the point where a CNAV fund will not longer be able to maintain a constant price, i.e. it will 'break the buck'. Therefore, all investors are incentivised to redeem first, i.e. amortised cost accounting/CNAV funds are subject to increased run risk¹⁰.

We agree that redemptions from a CNAV fund may concentrate losses amongst remaining investors. *However, we note that redemptions from a VNAV fund may concentrate losses amongst remaining investors in essentially the same way, due to the bid-offer spread.* This is also worth illustrating by way of an example:

At T_0 , a newly incorporated VNAV fund receives a subscription of USD1,000 and uses that to purchase 1,000 assets for USD1.00 each. At T_1 , bid value of each asset is USD0.99 and the offer value is USD1.01, i.e. the mid-value remains USD1.00 and consequently the variable price per share also remains USD1.00. At T_2 , 50% of investors redeem their shares, receiving subscription proceeds of USD500.

¹⁰ We have written elsewhere about 'run risk' in MMFs, see 'Money Market Funds, Bank Runs and the First Mover Advantage', Hannam, IMMFA, December 2012, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2187818

To fund the redemption payment, the fund must sell 505.0505 assets at a bid price of USD0.99 (505.05 x 0.99 = 500). Consequently, the mid-value per share of remaining investors falls from USD1.00 to USD0.9898 ((1,000 – 505.05) / 500)¹¹.

All pooled investment vehicles – whether CNAV or VNAV, whether money funds or equity funds – can cause ‘frictional’ transfers of value between subscribing and existing, or redeeming and remaining investors. Such transfers are inequitable. However, they are also generally immaterial. It is no accident that in the examples above we had to assume very large redemptions of 50% in order to illustrate an impact that was meaningful.

We acknowledge that the bid-offer spread on VNAV MMFs is typically very small. But the bid-offer spreads on equity or bond funds may be quite large, and certainly much larger than the ‘discrepancy’ between the amortised price and fair value of assets in a CNAV MMF. Therefore in principle, it is unclear why securities regulators suppose this phenomenon is acutely problematic for CNAV funds, but not for VNAV funds with equivalent or greater bid-offer spreads.

To illustrate this point, we asked a large fund administrator to provide bid-offer spreads for sixteen exchange-traded funds¹². This data shows that, on average, the bid-offer spread was 0.007%. By way of comparison, research by the Investment Companies Institute¹³ shows that the discrepancy between fair and amortised price of US prime MMFs between 2000 and April 2010 was 0.002%.

	Fund A			Fund B			Fund C			Fund D		
	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%
Oct	104.4	104.42	0.0575	41.06	41.07	0.0244	45.5	48.12	5.7582	36.62	36.74	0.3277
Sept	107.3	107.37	0.0839	41.38	41.39	0.0242	45.27	45.51	0.5302	34.6	34.64	0.1156
Aug	107.5	107.56	0.1024	39.23	39.28	0.1275	44.8	45.21	0.9152	33.07	33.18	0.3326
July	107.6	107.7	0.0836	39.04	39.06	0.0512	42.87	42.96	0.2099	34.13	34.17	0.1172
June	103.1	103.28	0.1552	39.18	39.2	0.0510	42.69	42.86	0.3982	33.65	33.68	0.0892
May	102	102.07	0.0686	37.6	37.62	0.0532	39.29	39.66	0.9417	33.11	33.49	1.1477
April	101.7	101.78	0.1082	42.22	42.26	0.0947	45.01	45.14	0.2888	37.95	38.15	0.5270
Mar	101.7	101.74	0.0885	42.95	43.02	0.1630	46.08	46.2	0.2604	36.62	36.74	0.3277
Feb	98.42	98.55	0.1321	44.21	44.27	0.1357	45.86	45.99	0.2835	40.15	40.21	0.1494

	Fund E			Fund F			Fund G			Fund H		
	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%
Oct	11.81	11.83	0.1693	40.23	40.3	0.1740	117.8	117.98	0.1528	19.11	19.18	0.3663
Sept	11.54	11.59	0.4333	40.23	40.28	0.1243	117.11	117.39	0.2391	19.03	19.13	0.5255
Aug	11.17	11.22	0.4476	40.1	40.13	0.0748	117.27	117.48	0.1791	19.02	19.09	0.3680
July	10.96	10.99	0.2737	39.81	39.88	0.1758	116.72	116.94	0.1885	18.86	18.92	0.3181
June	10.71	10.75	0.3735	39.4	39.5	0.2538	110.91	111.4	0.4418	18.68	18.78	0.5353
May	10.33	10.38	0.4840	38.08	38.14	0.1576	113.11	113.71	0.5305	18.38	18.44	0.3264
April	11.06	11.28	1.9892	39.63	39.75	0.3028	109.05	113.21	3.8148	18.74	18.79	0.2668
Mar	11.3	11.34	0.3540	39.39	39.49	0.2539	110.4	110.55	0.1359	18.61	18.68	0.3761
Feb	11.23	11.24	0.0890	39.97	40.1	0.3252	111.02	111.91	0.8017	18.84	18.87	0.1592

	Fund I			Fund J			Fund K			Fund L		
	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%	Bid	Offer	%
Oct	108.7	108.84	0.1380	25.16	25.35	0.7552	17.4	17.53	0.7471	8.97	9.06	1.0033
Sept	108	109.18	1.0739	25.23	25.46	0.9116	17.4	18.12	4.1379	9.17	9.18	0.1091
Aug	108.9	109.12	0.1652	25.29	25.54	0.9885	16.96	17.1	0.8255	9.05	9.07	0.2210
July	109	109.1	0.1009	25.45	25.6	0.5894	15.51	17.38	12.0567	8.95	8.98	0.3352
June	108.4	108.47	0.1015	25.24	25.28	0.1585	15.81	16.76	6.0089	9.39	9.42	0.3195
May	108.4	108.61	0.1845	25.35	25.4	0.1972	15.51	16.32	5.2224	8.88	8.91	0.3378
April	108.1	108.54	0.3699	24.92	24.96	0.1605	17.53	17.59	0.3423	9.74	9.76	0.2053
Mar	107.9	108.01	0.1298	24.52	24.64	0.4894	17.28	17.34	0.3472	10.16	10.18	0.1969
Feb	108.1	108.24	0.0925	24.65	25.05	1.6227	17.18	18.19	5.8789	9.96	9.99	0.3012

¹¹ In fact, because investment funds use ‘forward pricing’, the impact that redeeming investors have on remaining investors is slightly less than shown above, but illustrating that would merely complicate the calculation without altering the fundamental point, i.e. that redemptions and subscriptions from mid-priced VNAV funds can impact remaining investors.

¹² Example refers to ETFs as the bid-offer pricing is easily available on exchange. Similar spreads should be expected for mutual funds which use bid-offer pricing

¹³ “Pricing of U.S. Money Market Funds”, ICI, January 2011, www.ici.org. The ICI collected weekly data on shadow prices from a sample of 53 taxable money market funds. In April 2010, those funds accounted for 11 percent of the number and 27 percent of the assets of all taxable money market funds, about the same percentages as in August 2008.

How might investor fairness be ensured?

Notwithstanding that frictional transfers between subscribing/existing and redeeming/remaining investors might be very small, nor that they might arise in both CNAV and VNAV funds, two things might be done to reduce them further or eliminate them entirely:

- Adopt dual pricing; or
- Adopt swing prices/liquidity fees.

Adopt dual pricing

The 'purest' way of eliminating frictional transfers that might arise from using either amortised cost pricing or mid-pricing, would be to require all investment funds, including MMFs, to adopt dual pricing.

A dual-priced fund publishes two prices: a bid price for subscriptions; and an offer price for redemptions. The bid and offer prices reflect the bid and offer spread on the mark-to-market prices of the fund's portfolio. The offer price ensures that subscribing investors do not disadvantage existing investors to the extent that the offer price is lower than bid. The bid price ensures that redeeming investors do not disadvantage remaining investors to the extent that the bid price is higher than offer.

Setting aside the problem of evaluating mark-to-market prices for money market instruments - let alone their bid-offer spread - the problem with dual pricing is that investors have never responded favourably to it. The reason appears to be behavioural: even though dual pricing provides investors with the highest standard of fairness, they do not value that fairness if it means that a share in an investment fund for which they subscribe at today's bid price, can only be redeemed today at a lower offer price. In other words, investors do not like dual pricing because it results in an immediate mark-to-market loss on subscriptions: they prefer the illness to this particular cure.

Adopt swing prices/liquidity fees

Generally, frictional transfers are very small. However, as the examples above illustrate, in certain extreme circumstances they might become material. For example, if a subscription or redemption by an investor is very large relative to the size of the fund, or if market conditions cause spreads to widen, then frictional transfers might become material.

In order to address this issue, EU investment funds are often empowered to impose a 'swinging price' on a subscribing or redeeming investor, if that is required to ensure fair treatment other investors. The swinging price can be calculated in a number of ways but, in principle, reflects the bid-offer spread. In effect, the difference between the swinging price and the published mid-price represents an equalisation payment.

This is an effective solution. It enables funds to maintain single/mid pricing, but to avoid material frictional transfers. It is widely accepted by investors.

We believe it is worth considering an equivalent solution to frictional transfers in MMFs: specifically, and as has been proposed elsewhere, a trigger based liquidity fee would enable MMFs to impose a levy to ensure fair treatment of redeeming/remaining investors during a financial crisis. To that extent, liquidity fees should appeal to securities regulators.

In addition we note that IOSCO has argued liquidity fees may disincentivise/slow down redemptions. To that extent, liquidity fees should appeal to systemic risk regulators.

Conclusion

In the absence of traded or quoted prices, amortised cost accounting is a pragmatic way for MMFs to evaluate the fair value of money market instruments. Amortised cost accounting is widely used in the financial statements of MMFs in the EU (where it is often used as a proxy for fair value) and in the USA (where it has been accepted by the Financial Accounting Standards Board as compliant with generally accepted accounting principles). Amortised cost accounting (and equivalent valuation techniques) is also used in the financial statements of banks to value loans and certain other assets.

Nevertheless, securities regulators remain concerned that amortised cost accounting might not always be a good estimate of fair value and might therefore cause a disadvantage to investors in MMFs.

We have noted a number of regulatory reforms that have materially reduced interest rate and credit risk in MMFs, and therefore reinforced the reasonableness of amortised cost as a proxy of fair value.

More importantly, we have noted that the disadvantage to investors in MMFs due to differences between amortised cost and fair value is typically less significant than the disadvantage to investors in other types of investment funds due to differences between bid and offer prices. In any event, in both cases such disadvantages are – with few exceptions – not material. And even if a material disadvantage were to arise, the simplest and most effective remedy would not be to prohibit amortised cost accounting by MMFs, or mid-pricing by other investment funds, but rather to empower all funds to impose an equalisation payment on subscribing or redeeming investors. This might take the form of a trigger based liquidity fee, which would enable MMFs to impose a levy to ensure fair treatment of redeeming/remaining investors during a financial crisis.

Notwithstanding these arguments, and as describe in the introduction to this paper, some regulators remain adamant that CNAV funds pose greater risks than VNAV funds, and therefore the mechanisms that enable CNAV funds to maintain a constant price – including amortised cost accounting - should be restricted or even prohibited, irrespective of their merits.

Typically, critics of CNAV funds have made behavioural arguments in support of VNAV funds. For example, in the United States the President's Working Group has said:

“By making gains and losses a regular occurrence, as they are in other mutual funds, a floating NAV 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.”¹⁴

We have yet to see any substantive evidence in favour of these behavioural arguments, i.e. evidence that investors in VNAV MMFs *regularly* experience gains and losses; and that the experience of such gains and losses has made them less prone making sudden or destabilising redemptions. Indeed, we are aware – and have cited – important counter evidence, i.e. evidence that investors in French VNAV *monétaire* funds rarely experience gains and losses; and that investors in *enhanced* MMFs which experienced losses in 2007 undertook even greater redemptions than investors in US CNAV funds in 2008.

This should come as no surprise. Investors usually respond to declining prices/increasing losses by selling assets, especially if those losses arise in a fund whose investment objective is to provide security of capital, and even more especially during a financial crisis, which would tend to heighten their loss aversion. It seems self evident that daily fluctuations in the price of a VNAV fund will not cause such deep seated behavioural norms to reverse.

¹⁴ “Report of the President's Working Group on Financial Markets: Money Market Fund Reform”, October 2010, www.sec.gov

In the absence of supporting evidence, the behavioural arguments against CNAV funds will remain contentious and implausible. More importantly, the MMF reform debate will remain fixated on the merits of CNAV/VNAV pricing, and continue to ignore more fruitful reform proposals, including the proposal for a trigger based liquidity fee.

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