Mark-to-Market and Mark-to-Model Challenges for the Money Market Funds Industry

Introduction
On 4 September 2013, the European Commission proposed a European framework for the regulation of Money Market Funds (MMFs). The proposed EU regulation1 (the “Regulation”) introduces common standards designed to increase the stability and liquidity of MMFs and also contain additional transparency and reporting rules. The proposed regulation seeks to address concerns over the systemic risk that may arise as a result of an investor run. To this end, uniform rules will be introduced to ensure a minimum level of daily and weekly liquid assets; a standardized policy will be established to require the fund manager to gain a better understanding of its investor base; and common rules are also proposed to guarantee that MMFs invest in high quality and well diversified assets of good credit quality.

One of the measures proposed in order to ensure stability that has caused much discussion, is the creation of clear and harmonized valuation rules for the assets in which MMFs invest. While Constant NAV (“CNAV”) MMFs will have the possibility of maintaining the accounting methodology permitting a stable subscription and redemption price, this will only be on condition that they provide a NAV buffer to be financed by the manager of the MMF.

1 Proposal for a Regulation of the European Parliament and of The Council on Money Market Funds
Chapter IV of the Regulation deals with the valuation of an MMF’s investment assets and the calculation of the MMF’s net asset value per unit or share. Articles 26-28 contain rules on how a MMF should value portfolio investments, calculate the net asset value (NAV) per unit or share of the MMF as well as the frequency of both sets of valuations. While there is a general rule favouring mark-to-market and mark-to-model valuation techniques, MMFs offering a stable NAV redemption profile (CNAV funds) may value assets at amortised cost.

Currently all CNAV MMFs use amortised cost to value the assets in their investment portfolios and many Variable NAV (“VNAV”) MMFs also use amortised cost to value portfolio investments with a maturity of 90 days or less. The proposed prohibition on the use of amortised cost in the valuation of portfolio assets in VNAF MMFs will have wide ranging implications for such MMFs. This paper looks at the mark-to-market and mark-to-model approaches that may be used to value the financial instruments held by MMFs and considers some of the limitations and weaknesses with these approaches.

**Determining fair value for MMF Portfolio Instruments**

Mark-to-market, sometimes known as fair value accounting, refers to the accounting standards which determine the value of a position held in a financial instrument based on the current fair market price for the instrument or similar instruments. Fair value accounting has been a part of US Generally Accepted Accounting Principles (“US GAAP”) since the early 1990s and came into the International Financial Reporting Standards framework (“IFRS”) around 2000. The use of fair value measurements has increased steadily, primarily in response to investor demand for relevant and timely financial statements that will aid in making better informed decisions.

IFRS 13 “Fair Value Measurement” which is the latest standard within the IFRS framework dealing with the measurement of fair value defines fair value as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” The definition of fair value in US GAAP is consistent. Broadly speaking, fair value can be estimated using either (i) a quoted price in an active market (mark-to-market) or (ii) in the absence of an active market, a valuation technique based on observable market inputs and/or recent market transactions (mark-to-model).

Both US GAAP and IFRS recognise that price quotations in an active market are the best evidence of fair value and must be used, in priority to other valuation techniques such as mark-to-model methods, when they exist. This hierarchy is also encouraged within IOSCO’s policy recommendations for MMFs².

In normal market operating conditions mark-to-market is real as it reflects the values in actual market transactions between willing buyers and sellers. There is a single price which is transparent to all in the market. Mark-to-model has meaning only if the model used reflects the reality of the market and the degree to which a model used accurately reflects market value is usually determined by regular stress testing and back testing. Often while models are operative over the long term, market factors can cause the model to fail at any one specific point for any number of reasons.

All models require raw data to calculate a valuation of an asset. This presents many issues which must be addressed by the user of the models. For example:

(i) Which data source should be used?
(ii) What time of day should data be pulled into the model?
(iii) Is independent verification of data possible on both a time and cost-efficient basis?

All models used to mark-to-model MMF portfolio instruments discount the cash flows of the instruments to determine a current or estimated value. The quality of the model’s output is therefore also dependent upon:

(i) the certainty of the future cash flows;
(ii) the selection of one or more appropriate discount rates; and
(iii) the liquidity of the securities in the portfolio.

If the cash flows have a high likelihood of varying from expected cash flows, the quality of the model’s output may be poor. With respect to the discount rate, it is often difficult to select the appropriate rate.

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² Policy Recommendations for Money Market Funds, October 2012: Recommendation 4: Money market funds should comply with the general principle of fair value when valuing the securities held in their portfolios. Amortized cost method should only be used in limited circumstances.
Composition of MMFs by instrument and market type

Generally MMFs portfolios consist of a number of different types of financial instruments with very short maturities, which are typically held to maturity:

In normal market conditions the availability, or even the existence, of a secondary market for trading these instruments will vary significantly with some having a liquid secondary market (treasury securities), some having minimal secondary activity (commercial paper, certificates of deposit) and some having no market (bank deposits, repurchase agreements). The table below sets out details of the different market types for the types of financial instruments which MMFs typically invest in.

<table>
<thead>
<tr>
<th>Instrument type</th>
<th>Market type</th>
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</thead>
<tbody>
<tr>
<td>Treasury bills, treasury bonds, agency securities</td>
<td>Active secondary market for treasury and agency securities typically held by MMFs</td>
</tr>
<tr>
<td>Bank and corporate bonds</td>
<td>Secondary market exists for these securities but size and liquidity can vary significantly depending on instrument and issuer type</td>
</tr>
<tr>
<td>Commercial paper, certificates of deposit</td>
<td>Securities are transferable and liquid but secondary market is very thin, presenting challenges for price observability</td>
</tr>
<tr>
<td>Repurchase agreements, bank deposits, call accounts</td>
<td>Non-transferable, no secondary market</td>
</tr>
</tbody>
</table>

Mark to market

Market values for treasury and agency securities, bank and corporate bonds are typically determined by reference to observable quotes obtained in the secondary market. Unlike equities, these securities are not bought and sold on a stock exchange, instead transactions take place primarily in the bilateral, over-the-counter (OTC) market. As such, market price indications are either obtained directly from brokers or via consensus price providers (e.g. Bloomberg, Reuters, Interactive Data). These secondary market indications should be reliable estimates of market value where such indications reflect the values at which actual transactions take place in the market. However, when using such prices it is important to understand the basis for the price quote. Is it based on a recent transaction or is it a price which the broker or consensus provider has derived from matrix pricing or models? The user of the price also needs to be clear about the capacity in which the provider is providing the price. Are they a market maker or do they otherwise transact in the portfolio investment in question? The fundamental question is whether or not the market price indication received is the price that the MMF would actually receive if it sold the portfolio investment in question.
In a market when trading volumes decline significantly and assets cease to be liquid, market values obtained directly from brokers or via consensus price providers may not be deemed reliable indications of fair value for particular portfolio investments. In such instances the pricing challenge for MMFs in using such pricing sources is no different to that faced by other mutual and hedge funds.

**Mark to model**

**Commercial Paper (CP) and Certificates of Deposit (CD)** are transferable securities but there is very little by way of secondary trading for them. Due to the short maturity of these types of financial instruments they have very low sensitivity to movement in market rates and, as such, there is minimal incentive to actively trade these instruments (i.e. frequent buying and selling to gain from short term price movements). Other than an unexpected need for cash, investors will typically hold CP and CD to maturity.

With very limited volumes of secondary trading for these assets, fair value must be estimated using a discounted cash flow methodology based on current yield curves. For CP and CD, there should not be, in normal market conditions, any significant difficulties with the mathematical modelling of cash flows. However, there could be differences between market participants with respect to the construction of yield curves for the purpose of discounting those cash flows.

There are two different approaches which could be employed:

(i) **Money market yield curve**

The simplest approach, and one that is already used in practice by many MMFs already applying fair value accounting, would be to discount the cash flows using money market yield curves. One common approach is to use Libor curves (rates for short term, unsecured interbank borrowing and lending) for the relevant currencies.

To minimise basis risk (i.e. the risk that the valuation is based on a yield curve that fails to incorporate all components of risk within these instruments) in the valuation of CP and CD, however, a more accurate approach would be to use composite rate quotes for new CP and CD issuances, typically quoted in the market for top-tier and second-tier issuers in USD, EUR and GBP. Whilst such rate quotes are available from some market data vendors, there are concerns in the market as to the accuracy and the transparency of these composite curves and a general sentiment that they are not currently fit for purpose.

Additionally, whilst the use of money market curves captures the effect of industry-level yield changes on asset valuations it excludes the impact of issuer level, idiosyncratic risk (i.e. the risk of default by a specific issuer that is not reflected in composite, industry-level yield curves).

(ii) **Issuer yield curve**

We noted above that composite rate quotes can be obtained for new issuances although it should be noted that observability can be limited in EUR and GBP CP/CD markets. However, these curves are not sufficiently granular to determine the rate at which a specific issuer will be able to issue new CP and CD. Some issuers will pay rates above the industry curve and some will pay rates below. Therefore, to most accurately determine the fair value of the CP’s and CD’s from specific issuers the cash flows should be discounted using issuer-specific yield curves.
In the absence of daily, issuer-level money market rate quotes the construction of issuer yield curves presents some modelling challenges. Any curve construction will suffer from the absence of secondary market quotes at the short-end. However, the objective will be to produce issuer yield curves that are responsive to idiosyncratic risks and which produce accurate fair values when the issuer experiences positive or negative market sentiment.

Without a secondary market, credit spread data can only be observed in the new issuance market. As such, spreads can be observed as and when issuers actually issue new CP into the market. New issuance, however can be infrequent and this therefore creates challenges in avoiding static pricing information at the short end of the issuer curve. Such static information may mean the issuer curve is not reactive to current market sentiment. Up to date pricing data for a specific issuer may be observed in the bond or credit default swap (CDS) market but incorporating this information to produce current issuer CP and CD curves can be difficult as the dynamics of the bond and CP/CD markets are very different.

**Practical challenges**

Within the mark to model approach the practical and operational differences between the application of (i) money market yield curves and (ii) issuer yield curves are significant. The complexity and access to market data sources (including broker dealers) necessary to apply the issuer yield curve approach may require significant investment and could mean that all but the largest managers and administrators would need to rely on third party vendors for daily valuations.

From a cost-benefit analysis perspective, the MMF industry will need to determine whether the desire for additional price accuracy and transparency, from using specific issuer spreads rather than composite spreads for similarly rated issuers, is sufficient to require the application of this more onerous valuation methodology. Money market yield curves (the CP and CD curves referred to above) will already capture the impact of widening and tightening industry credit spreads, although it should again be noted that concerns exist as to the quality and transparency of existing curve sources. The benefit of additional granularity through the use of issuer yield curves will depend on:

(i) Spreads between issuer and money market curves;

(ii) Residual maturity of those issuers whose spread is materially different to money market curves; and

(iii) The percentage of these assets in the MMF portfolio.

Moreover it needs to be determined whether either of these approaches is preferable to existing valuation methodologies, where amortised cost is deemed to be materially consistent with fair value. This approach has long been considered an acceptable approach because (i) the short maturity of the investments means they are not sensitive to changes in market yields post initial purchase date and (ii) the use of initial cost at least provides an observable, traded market price when few if any can be observed thereafter. IOSCO policy recommendations also acknowledge that for certain short term instruments, absent any specific credit concerns or sudden spikes in interest rates, amortised cost may provide an accurate estimate of market price.

For those assets that are sufficiently close to maturity (e.g. call accounts, repurchase agreements and term deposits within one week of maturity), absent any specific default risk, par is typically used as an estimate of fair value.

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**Summary of valuation approaches**

<table>
<thead>
<tr>
<th>Instrument Type</th>
<th>Valuation Approach</th>
<th>Complexity</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury and agency securities, bank and corporate bonds</td>
<td>Published clearing prices or tradable broker quotes from secondary market</td>
<td>Low - Prices sourced from brokers or consensus services</td>
<td>Market price</td>
</tr>
<tr>
<td>Commercial paper, certificates of deposit, term deposits</td>
<td>Discounted cash flow valuation based on industry yield curves</td>
<td>Medium - Standardised modelling methodology, readily observable market curves</td>
<td>Model price - capturing valuation impact of industry level yield changes</td>
</tr>
<tr>
<td></td>
<td>Discounted cash flow valuation based on issuer yield curves</td>
<td>High - Complex, requiring significant investment or outsourcing to third party specialists</td>
<td>Model price - capturing issuer-specific credit spread changes</td>
</tr>
<tr>
<td>Call accounts, short term (one week) deposits and Repurchase agreements</td>
<td>Par used as proxy for fair value</td>
<td>Low</td>
<td>Model price</td>
</tr>
</tbody>
</table>
**Governance and operational issues**

**Issues for directors**
Whether valuations are performed in-house or outsourced to fund administrators or third party specialists, the directors of an MMF will need to be satisfied as to the appropriateness and accuracy of the valuation basis. In addition, IOSCO recommend that MMF valuation practices should be reviewed by a third party.

**Issues for investors**
With respect to a change in valuation basis the main concern for MMF investors will be the impact on timely access to funds. The current amortised cost model allows investors to redeem shares and receive the proceeds on the same day (T₀). However, the change to mark-to-market or mark-to-model might see MMF redemptions move to a T + 1 basis, in line with other fixed income mutual funds. If the impact of this change proved to be sufficiently disruptive to investors then (costly) alternatives might include intraday valuation or processing redemptions post end of day valuation.

**Issues for auditors**
The change to fair value accounting will require additional effort on the part of auditors in terms of verifying the appropriateness and accuracy of those valuations used in the financial statements. The effort required will also depend on the range of valuation methodologies applied by the MMF.

**Conclusion**
The main challenge with the mark-to-market valuation approach is whether MMFs can estimate fair values accurately and without discretion. When identical positions trade in liquid markets that provide unadjusted market values, mark-to-market generally is the most accurate and least discretionary measurement approach. The same instrument will be attributed with a consistent value at any one point in time by different market participants.

However pricing is typically less accurate and more discretionary when either adjusted mark-to-market values or mark-to-model values are used. In adjusting mark-to-market values, MMFs may have to make adjustments for market illiquidity or for the dissimilarity of the position being fair valued from the position for which the market price is observed. These adjustments can be large and judgmental in some circumstances. In estimating mark-to-model values, MMFs have choices about which valuation models to use and about which inputs to use in applying the chosen models. All valuation models are limited, and different models capture the value-relevant aspects of positions differently. To promote consistency in application across MMFs, observers such as IOSCO recommend independent review of the mark-to-model process. In addition there are recommendations around the disclosure in offering memoranda and annual financial statements of the source of market data and methodologies used by the MMF which would enable investors to have a clear understanding of the valuation methodologies in place.

In stressed market conditions, if the financial markets behave as they did in 2007 and 2008, with the exception of some treasury securities, it is possible that valuations may become entirely mark-to-model based under the proposed European framework as sufficient data to enable reliable mark-to-market valuations to take place would not exist. MMFs may have to apply the valuation models using inputs derived from historical data that predict future cash flows or correspond to risk-adjusted discount rates imperfectly. The periods over which MMFs choose to analyse historical data to determine these inputs can have very significant effects on their mark-to-model values. To the extent that such model valuations proved to be poor estimates of the actual prices at which market participants were willing to transact in this scenario, the likelihood of ‘first mover advantage’ would remain.