Measuring risk

Marcus Schüler, md at Markit, considers how best to measure the risk properties of a financial product

Regulators and market participants alike are currently considering whether and how to tackle the issue of "undue reliance" on credit ratings in their own rules. Potential rule changes aim to ensure that credit rating information is but one input that informs a minimum standard of investor due diligence.

Generally, the response from industry associations as well as investors to consultations on this issue has been negative, which can probably be explained by the fact that, while a clearly defined benchmark is supposed to be removed, no credible alternatives are being offered in return. It is probably fair to say that assigning investors with the responsibility for judging whether a product is "eligible" creates a related requirement for the availability of clear guidance on how to define and calibrate alternative measures of the risk properties of such eligible assets.

Without this clear guidance, investors would likely incur significant administrative costs, and experience elevated levels of uncertainty. The systemic effect could be very meaningful, with the potential to impair the ability of investors to transact.

Prior to the removal of references to credit ratings in regulatory requirements, market participants should explore alternative methodologies to evaluate the risk properties of a product. While, most importantly, these alternative provisions should be an accurate reflection of the risk parameters that they are aiming to measure, they should ideally also be forward-looking, objective, observable, easy to source and simple to compute. Only this combination of attributes will maximise market transparency and minimise the cost and potential for uncertainty of the process.

What do we actually want to measure?

The decision as to whether a product qualifies as "eligible" for an investor should be based on an informed and thoughtful judgment of the product's risk properties or, to be more exact, its level of actual and measured credit risk, its liquidity and its volatility. Credit ratings traditionally focus solely on accurately reflecting credit risk, but neither the liquidity nor the volatility of the product. Removing references to ratings would hence enable market participants to have a fresh look at how best to measure all three of these risk parameters.

Without a proper definition of risk proxies though, investors will be left with not only the near-impossible task of deciding whether an instrument contains "minimal" or "no greater than moderate" credit risks, but also with the question of whether it is sufficiently liquid. To minimise the burden on investors, it is thus advisable to determine whether the characteristics of credit risk, liquidity and volatility are quantifiable, whether they can be easily measured and whether there is a ready source for the relevant information.

The financial markets are highly sophisticated, and have evolved to provide independent indications of all three required product characteristics, including creditworthiness, liquidity and volatility. Market-based measures are easily observable and transparent, updated frequently and built on both the expectations and actual transactions of all relevant market participants.

The use of a large and complementary set of relevant data to inform the measures of credit risk, liquidity and volatility of a financial product presents material advantages. While some additional research might be helpful in forming a consensus judgment as to whether and which market-based measures are best suited as proxies for these risk properties, the following is a summary of my thoughts on these topics.

Measuring credit risk

Credit markets incorporate all available information processed by all relevant market participants at any point in time, and provide a market clearing price for many names on an almost continuous basis. Traded credit spreads hence may prove to be the most accurate measure not only of the current credit risk of a specific name but also a good predictor of its future development. While the approach of using actual credit spreads to measure credit risk has been implemented by a number of market participants and discussed in academic literature to a certain extent, I feel that further research might be helpful in determining how accurate the predictive quality of credit spreads is, how credit spread information could be used in practice, and also what actual measure of the credit spread should be used to avoid potential undesired side effects such as pro-cyclicality or elevated volatility.

Markit collects millions of price points on financial products from all market-makers every day, ranging across markets including bonds, CDS and ABS to exotic derivatives across the asset classes of interest rates, equities, commodities, FX and structured credit. We perform a number of cleaning algorithms, such as testing for stale data, for flat curves or for recycling, in order to produce high-quality consensus pricing data across all asset classes and formats of exposure.

In credit default swaps, for example, approximately 3,400 curves are published every day, with spread history for many of them available from 2001. Furthermore, we capture current bid/offer levels on many of these names through intraday dealer quotes, and compute intraday credit spread curves as an amalgamation of end-of-day contributions and quotes feeds.

The determination of credit risk could easily be based on this wealth of credit

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spread data sourced from the markets. However, using simply the current credit spread as a measure of credit risk might introduce an undesired level of volatility and runs the risk of occasionally being exposed to technical pressures. It might hence make sense to compute rolling averages of credit spreads in order to create credit risk measures with higher stability.

That said, there probably needs to be a discussion about the exact nature of the averages, where it might be advisable to use exponentially weighted averages to assign a higher importance to recent spread movements as they will incorporate relevant new fundamental information for the name. Also, it might be worth considering whether the weightings of such an average should be static or whether they could change. One option might be to allow regulatory bodies to review and potentially change the weightings or time periods of the averages being accepted in order to reflect special market situations or avoid any undesired pro-cyclicality of these credit risk measures.

The approach of using market-sourced credit spreads would also hugely simplify the ongoing task of monitoring credit exposures on a timely basis and at limited cost. Instead of burdening investors with the obligation of ensuring that they are aware of any information that suggests that an investment may not continue to present minimal credit risks – which not only requires continuous monitoring of the news services but also deciding whether a piece of news is relevant – investors could simply use the power of the markets that perform the task of checking for news and incorporating it into spreads anyway, on a constant basis and at no additional cost.

A number of market participants and academics have already started producing and analysing market-based measures of credit quality. A number of rating agencies now even publish "Market-Implied Ratings", and have already conducted studies demonstrating that market-implied ratings have proved to be accurate predictors for changes of "actual" credit ratings.

Besides using market credit spreads to measure the credit risk of an investment, the measurement of volatility of investment products (another relevant factor that should be taken into account by investors when deciding on their eligibility) could be based on the same data set, where likewise the major challenge would not really be the data input, but rather the exact way in which the measure of volatility should be calculated.

Often, in rules for investment firms, reference to credit ratings is made to identify "high-quality money market instruments" with an unrated instrument not being considered to be of high quality. The usage of credit spreads as a credit risk measure would be much more accurate, and would be capable of revealing that many unrated securities are actually less risky than rated ones. In the area of the Capital Requirements Directive in particular it is worth noting that compared with the approach of using individual internal models to calculate capital requirements, a reference to market-sourced credit spreads could represent a more transparent, simplified and standardised way to achieve a similar result, while avoiding potential conflicts of interest inherent in allowing the usage of these models.

To summarise, using market-sourced credit spreads as a measure of credit risk and volatility would be beneficial to market participants. Such a measure could support existing credit ratings, as input into dealers' own models or as the basis for a standardised, market-wide measure as agreed with regulatory bodies. Needless to say, this approach would have the potential to significantly reduce regulatory compliance costs for the affected market participants compared with alternative methodologies. However, in an ideal world, the measurement of the risk properties of a product should also cover its liquidity risk – actually an even more challenging task than the measurement of creditworthiness or volatility.

Measuring liquidity

The ideal measure for the risk property "liquidity" of a financial product should reflect the ability of an investor to sell the product in the market within a certain time period at a level close to the current price. However, the challenge consists in quantifying and measuring this potential future liquidity for financial products in an objective and accurate way. The measure should be observable, dynamically updated and forward-looking, and it should be available for the majority of relevant products.

Unfortunately, liquidity is not only an important risk property of a financial product, but it is also notoriously hard to measure. While some market participants would propose using actual trading activity in the past to measure potential liquidity in the future, the use of transactional volumes is exposed to a number of theoretical as well as practical issues, making them rather ill-suited for the desired purpose.

Daily trading activity can only ever be observed for a very limited part of the universe of all tradable products, and only for a subset of these are trading volumes actually publicly available. Liquidity measures derived from actual trading volumes could hence only be computed for a small number of products, and could not really serve as the benchmark measure for liquidity for the entire market.

Even for products for which trading volumes are available on a more or less regular basis, additional information would be needed to derive real liquidity indicators. In CDS, for example, some of the relevant questions would be: an isolated trade of €1bn notional with a one-year maturity really a sign of liquidity for this name in general? Should the number of trades or the volume be used to measure liquidity?

The fact that a product has not traded in the recent past should not be regarded as proof that it is not liquid, and the investor could not sell it quickly if he wanted to. Some products that might not trade today because there just is not enough interest in them currently are potentially very liquid if you want to trade.

Think of a tight spread name in CDS: it might not trade because no-one cares to buy protection on such a high-quality credit. However, it will probably be very easy to receive quotes from a number of market-makers and trade in size with a tight bid/offer, close to the current market price, if you wanted to trade it.

Finally, as the recent past has shown, the actual turnover of a product can dry up suddenly depending on the market situation, and past turnover has therefore proved not to be a consistent and accurate predictor of availability of liquidity in the future.

Given the described issues, it is fair to say that – while it does have value as additional input – transactional data alone will not suffice to measure future liquidity for the whole universe of relevant products. Fortunately, there exists a more reliable and appropriate way to measure the expected future liquidity of financial products: the Data Quality Rating, a parameter that we have been computing and publishing for many years based on the variety of daily market data contributions we receive.

Markit's Data Quality Ratings can be used as a good proxy for the liquidity of a product, given that they are derived from the following input parameters:

- The number of accepted pricing contributors for the product, i.e. the ones that are accepted after rejecting many others based on our cleaning algorithms;
- The freshness of the data, i.e. how recently the contributions were last updated by the contributors; and
- The range of accepted contributions, i.e. the difference between the highest and the lowest accepted prices.

All else being equal, a higher number of accepted contributors, a greater freshness of the data and a narrower range of accepted contributions will lead to a higher Data Quality Rating. Importantly, it will also signal a higher liquidity for this product, as more market-makers trade the name and will provide prices when needed, as they frequently update their prices. This reflects the ability of an investor to receive a number of tradable prices quickly, and that there is little disagreement about the current price (which implies that a tight bid/offer spread for a decent size should be expected).

If all of these factors are in place, they signal that the investor will likely be able to liquidate a position quickly, and close to the current price. Data Quality Ratings are dynamic and will reflect changes in the underlying variables on a daily basis. A detailed description of the computation of Markit's Data Quality

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Ratings is available on request.

In addition to these three inputs, we are in the process of integrating quotes data – i.e. live bid/offer runs that we receive from the market-makers – as well as transactional data, where we have it, into this liquidity measurement concept. One way of doing so will be to give a higher liquidity rating to names that appear on a number of quotes runs every day, as it signals that this name is actively traded by multiple dealers. We are also working on ways to take the quoted bid/offer into account, with a tighter bid/offer justifying a higher Data Quality Rating and expected liquidity.

Based on the current data set, we publish Data Quality Ratings for more than 1,800 credit default swaps (five-year maturity point) and more than 3,300 bonds globally. In CDS, more than 10 per cent of the names achieve a triple-A rating for their liquidity, while in the universe of bonds – reflecting a smaller number of contributors, less frequent updates and a wider range of contributions – the majority of the bonds will fall into the triple-B and double-B categories, an indication of the generally lower liquidity of bonds compared with CDS. See Table 1 for details of current liquidity ratings.

Using a combination of market-based credit risk, volatility and liquidity measures will provide investors with accurate, dynamic and transparent measures of the major risk characteristics of a financial product, and will allow them to make a sound decision on its eligibility. Instead of solely relying on credit ratings, implicitly assuming that a rating would be highly correlated with the liquidity and volatility of the product, a separate measurement of these characteristics is feasible and will result in a more accurate analysis of the overall risk of an investment.

Certainly, a constructive dialogue with regulatory bodies and academics is needed to explore how credit spread data could be used to conduct a study on the predictive qualities of credit spreads compared with credit ratings, and on how a credit risk measure based on credit spreads should ideally be defined and calibrated. Also, an open discussion should occur with regulatory bodies on how to best measure liquidity of a product based on a range of market-sourced inputs and how to potentially further develop and refine the definition of Data Quality Ratings to make them most useful for everyone's purpose to measure liquidity. ■

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Table 1: Liquidity Ratings for CDS and Bonds

	AAA	AA	A	BBB	BB	B	CCC
CDS	219	817	455	192	128	40	23
Bonds			21	606	1918	611	488

As of November 4, 2008, 5y point for CDS