Debt Specific Risk

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Debt specific risk arises when the price of a debt instrument moves out of line with similar instruments, due to principally factors related to its issuer. In general, debt specific risk is comprised of two components of credit risk: the event (rating migration risk) and default risk.

Therefore, a debt specific risk model can also be viewed as a credit risk model. However, to capture specific risk more appropriately, such models must also incorporate mechanisms to isolate specific risk from total risks that include general market risk as a component. Such a separation is necessary as banks often calculate general market risk in a separate model.

There are two general types of models available that can be used to calculate debt specific risk: the rating-based and spread-based credit risk models. In this section, we briefly overview these two types of credit risk models, with a focus on the Credit VaR and Idiosyncratic Spread Risk (ISR) models, and explain how the new DSR model is related to these models.

Rating-based models typically model the change of credit ratings (migration and defaults), which in turn affects the value of the portfolio and leads to quantification of risk due to both market-wide and issuer-specific events.

These models are closely related to structural models, which take Merton’s option theoretical approach that relates a firm’s capital structure to its credit status. While rating-based models capture credit risk due to downgrading and defaults, they ignores credit spread risk to which debt instruments such as corporate bonds are typically exposed. For example, each credit rating is associated with an average credit spread, which is the currently observed forward spread.

The evolution of average credit spreads for different rating categories is therefore deterministic, and knowing the distribution of ratings at the end of a given risk horizon implies that one knows the distribution of portfolio values. Since credit spreads observed from market are significantly deviated from average credit spread for each rating class, and such spread deviations may be firm characteristic, assuming zero spread risk misses an important dimension of risk and may lead to significant underestimate of debt specific risk, especially for high rated debt instruments.

Traditional rating-based models also have weaknesses in providing market responsive risk measures. Typically, they use an annual rating transition matrix as a main model parameter (which does not change on daily basis) and risks are calculated over a one-year horizon. As a result, these models do not fit well with trading practices and hence have difficulties in estimating credit risk in financial instruments that are actively traded and have daily changes in prices and volatilities.

The purpose of the DSR default modeling is for the debt specific risk (DSR) model to produce more realistic economic capital VaR numbers as well as to recognize more appropriately the hedge benefit.

In the debt specific risk (DSR) model, we applied a conservative treatment to the default events (for CDS positions only) in the following way. For long positions (i.e., sold protections) the loss is defined as usual (i.e., LGD´Notional), while for short positions we give conservative values when default occurs. For short positions (i.e., bought protections), we restrict positive P/L due to defaults. This fully conservative treatment is being applied to CDS feed, while all other feeds are treated conservatively on the un-hedged portion only.

The full conservative treatment has proved to be overly conservative, manifesting itself in unreasonably large economic capital VaR numbers. These large economic capital VaR numbers are mainly generated from default scenarios of CDS positions, due to the conservative treatment of defaults, regardless of whether or not the default risk is being properly hedged. They are not generated from idiosyncratic spread risk (P/L due to spread changes), which is being appropriately captured.

The solution is to recognize the benefit from taking short positions in CDS (i.e., bought protections) to hedge long CDS positions (i.e., sold protections) with the same underlying name and apply the conservative approach to the un-hedged portion as for all other feeds.

DSR analytic engines use various database tables as inputs, one of which is the "Portfolio" table under the "DSR" database. This table contains the list of all positions with their corresponding positional data required by the engines and it is used as the input portfolio for the DSR calculation on any given date.

Currently CDS positions appear individually under this table. This means that long and short CDS positions of the same underlying name (issuer) with identical default risk characteristics appear in two separate entries, which are considered as two separate positions by the DSR engine. If a default event is generated in a scenario for the issuer, the bought protection (short CDS position) should offset the loss from the sold protection (long CDS position).

However, the DSR engine does not make any assumption on whether the long and short CDS positions have the same underlying issuer with identical default risk profile. Instead, it applies a uniform conservative treatment for both long and short CDS positions. This has led to little benefit from taking the short positions to hedge the long positions, and, as a result, it has produced overly conservative VaR numbers.

To appropriately recognize the benefit of the hedges, we use the aggregated notional of those long and short CDS positions with the same underlying issuer to calculate the losses (P/Ls) in the default scenarios. No change is required in non-default scenarios in which P/Ls due to spread changes are calculated as it is. By applying the aggregated notional of these CDS positions, the hedges are correctly recognized in the default scenarios while the conservative approach is still applied to the remaining part of the un-hedged positions.

Moreover, it is assumed that rating transitions are independent of spread changes, which is unreasonable because a large upward move in spreads would probably imply a downgrade in credit rating. The CreditGrades model is another (structural) model that has been suggested to estimate issuer-specific risk in corporate bonds. However, the model focuses mainly on default risk. The credit spreads predicted by the model are more relevant to default swap levels, rather than credit spreads over government bonds, which may include risk premium and liquidity premium as components.

The second type of models are spread-based models that explicitly model how credit spreads are moved. Credit risk is captured through changes of credit spreads. The Bank's Idiosyncratic Spread Risk (ISR) model, which is currently used for the purpose of risk monitoring, is such a model. Another example of spread-based model is Barra's global credit risk model, which is designed to provide forecasts of risk due to general market-wide spread changes as well as issuer-specific credit events.

Reference:

https://finpricing.com/lib/IrCurve.html