

## TW3421x - Week 6 - Summary

Hi there, welcome to the summary of Week 6.

During last week, we have seen a lot of things together. So, I think that there is really the need to summarize all these different topics.

Have you noticed that now all the ingredients we have introduced so far start being mixed together, in order to produce our final recipe.

Ok, let's start.

The first topic we have discussed together is CreditMetrics.

CreditMetrics is a Merton-like model introduced by JP Morgan.

As Merton's model (or Moody's KMV) it is a model that takes into account the value of the assets of a company. This is surely something good if we want to have an updated estimate of the PD of a counterparty. In fact, the value of assets is surely influenced by the financial health of the company.

Differently from Merton's model, in CreditMetrics thresholds are not provided by liabilities, but obtained from credit ratings. These ratings can be external or internal, depending on the sophistication of the model.

The fact that thresholds are linked to credit ratings has three advantages.

First, we solve the problem of the unrealistic liability structure which affects Merton's model, as well as the problem of correctly assessing the value of debt, as seen under Moody's KMV.

Second, the fact that thresholds are derived from credit ratings, allows for the definition of several thresholds, for the different rating classes, so that we can also take into account credit deterioration.

Third, thresholds tend to be more stable over time, especially if we use external ratings as a starting basis. Could you say why?

Hence, all in all, CreditMetrics combines the strengths of both credit ratings and equity-based models.

Where is the problem then?

For example, the overall assumption of normality is not really reliable, especially during crises, when "business as usual" does not exist.

We have then seen how, under the F-IRB approach, the PD of a counterparty can be used to compute RWA and capital requirements, just using the formulas provided by the regulator.

In the F-IRB approach there are many different risk-weight functions we are supposed to use, depending on the type of instrument we take into consideration.

The fact that all functions are given by the regulator surely makes things easier for a bank. Once we have the PD, it is just a matter of computing some basic quantities.

Naturally this implies relying on some assumptions (once again Gaussianity, or the similarity of the correlation structure) that are not always realistic.

Finally we had a quick look at Credit Risk Plus.

We have said that CR+ is not a Merton-like model, that is it is not a structural model of default. In probabilistic terms, it is a mixture model.

CR+ relies on the Poisson distribution and it allows for many closed form results.

Under Credit Risk Plus, we can derive not only the PD, but also all the other quantities we are interested in, for the computation of RWA and capital requirements.

This is why Credit Risk Plus can be seen as an example of A-IRB approach.

Ok, that was the summary for this week.

See you next time. Bye.