

## Week 5 - The Sofa Session

Hi there,

welcome to this sofa session.

This week our sofa is a little bit different. This is due to the fact that I am in Switzerland, at my place in Bern.

This week we have studied two important structural models of default.

Merton's model and the KMV one. The KMV model, as we have said, can be seen as a derivation of Merton's one.

A question that we can ask, when dealing with these models is the following: are these effective in studying the probability of default of a company.

I mean, are they really useful?

For what concerns Merton's model, we can say that these model is rarely used in practice. It is surely one of the most influential models in the literature, probably THE model, the one used as a benchmark by scholars and practitioners, but its practical use is limited by its own flaws.

For example, we have seen that the liability structure assumed by Merton's model is not at all realistic. Even the smallest company has a liabilities' structure that is more complex than a single zero-coupon bond.

Moreover, Merton's model does not take into account the dependence among defaults. If you are a company and one of your major clients or suppliers defaults, this has a clear impact on your business, and hence on your probability of defaulting.

If many company defaults on the market, as during a crisis, we can expect a credit crunch that surely influences the probability of default of the surviving companies. And so on.

Finally, and this criticism is in common with all structural models of default, are we sure that the single threshold mechanism behind Merton's model is able to capture the complexity behind a default?

We all agree on the fact that deteriorating assets surely increase the probability of failing of a company, because of the problems of self-financing or the difficulties of getting loans from banks, but these are not the only causes of default, as we have seen.

Regarding the KMV model, it surely improves Merton's model, by changing the liabilities' structure and substituting the Normal distribution with an empirically estimated function that should better reflect reality.

?However, many scholars argue that this is probably not sufficient to capture real-life risk. Without entering into details about risk-neutral probabilities, we can say that the KMV model relies on some technical assumptions that are surely of from a purely financial mathematics point of view, but which can be unrealistic for real-life.

Finally, some empirical studies show that the EDF seems to work in a satisfactory way for defaults within 1 year, but quickly loses reliability for longer time horizon.? In fact, even if the 1 year time horizon is the most used and important one, remember the definition of EDF, naturally Moody's KMV produces estimates of the probability of default also for longer periods. In these cases, the new EDFs are not that good.

Ok, see you next week.

Bye.