Given the well-known drawbacks in the two leading paradigms (the structural models and the reduced-form models), information-based credit risk study has gained its popularity, starting from the important paper by Duffie and Lando (2001).

However, there are a number of fundamental issues with this approach. The first is the mathematical ambiguity about incomplete information such as the noisy information and the delayed information; The second is the inconsistency of different filtration expansion approaches: the minimal filtration expansion in Duffie and Lando (2001) and Lando (1998), and the progressive filtration expansion in Elliott, Monique and Yor (2000), Bélanger, Shreve, and Wong (2004); And the last issue is the inconsistency of intensity process in finance and mathematics: in the former it is the instantaneous likelihood of default while in the latter the Radon-Nikodym derivative of a compensator.

In this talk, we shall show how these issues are resolved in a unified filtration framework. More importantly, this framework allows us to extend the simple pricing scheme in reduced-form models to structural models, without however the conditional independence assumptions. Finally, we shall show the relevance of this generalization to statistical studies in credit risk.

This talk is based on joint work with Jarrow and Yan (2005), Jarrow and Menn (2006).