Credit Risk

Projects

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Project 1

Contagious Defaults in a Credit Portfolio: A Bayesian Network Approach

Project 1: Contagious Defaults in a Credit Portfolio: A Bayesian Network Approach

Description of the project: This project aims at studying how contagious models can be used to assess the resilience of an inter-banking market understanding and challenging [Chong et al., 2017].

Target: Clear description of the model suggested in the paper and an analysis on the retained hypotheses. You also have to create a tool to simulate the model that must be coded in Python on Google Colab.

Project 2

Modeling credit risk of a project finance loan portfolio

Project 2: Modeling credit risk of a project finance loan portfolio

Description of the project: This project aims at building a model to assess credit risk of a project finance loan portfolio capitalizing on [Harvey et al., 2016], without limiting the possibilities to the ideas of this paper.

Target: Clear description of the suggested model with an anaylis of the pros and cons of the retained modeling assumptions. You also have to create a tool to simulate the model and explore its characteristics in Python on Google Colab.

Project 3

Climate Risk: Transition and physical risk

Project 3: Climate Risk

Description of the project: This project aims at jointly modeling physical and transition risk within a Merton-like credit risk model, building up on [Bouchet and Le Guenedal, 2020].

Target: Introduce physical risk in the model as a Poisson component variable, whose jumps are proportional to the total asset value (any alternative may be proposed). You may consider a simpler model where physical risk occurs only once (with a exponential law time distribution).

- Assess the additional impact of transition and physical risk on default probabilities

Project 4

Assessing the credit risk impact of the pandemic

Project 4: Pandemic impact on credit risk

Description of the project: This project aims at (i) modeling credit rating thanks to a Kaggle Dataset and (ii) simulate the impact of the pandemic on ratings and hence on expected losses.

Target: Derive first a credit rating, based on the financial features provided in the Kaggle Dataset. Propose stressed financial features and recomputed credit rating. The change in credit rating on the portfolio should be translated in a change in average PD on the portfolio. Infer a 1Y, 2Y, 3Y expected impact on credit risk.
Link: https://www.kaggle.com/agewerc/corporate-credit-rating/version/1


Bouchet and Le Guenedal (2020).
Credit Risk Sensitivity to Carbon Price.
SSRN/Amundi Working Paper.
Link.


Chong et al. (2017).
Contagion in financial systems: A Bayesian network approach.
Arvix.
Link.


Harvey et al. (2016).
Modeling Project Finance Correlations.
Moody's Analytics.
Link.