Enbridge Inc. [TSX:ENB]
Credit Risk Analysis

Haoran (Alex) Yu

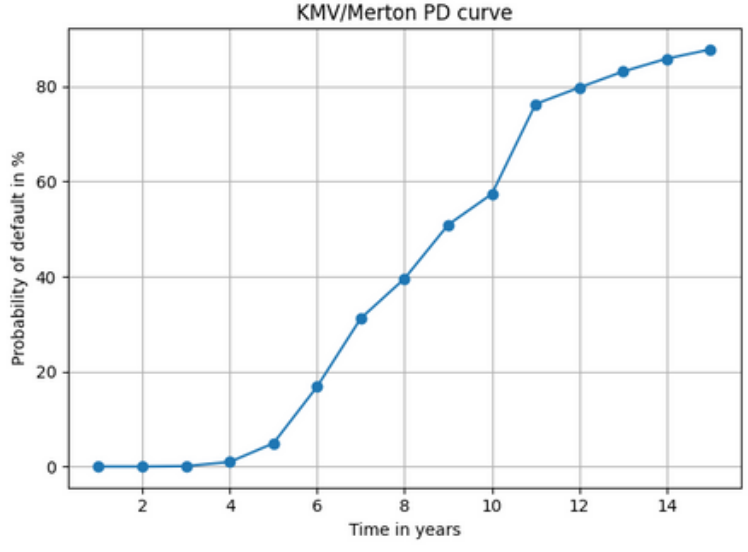
Merton/KMV Model

For the Merton/KMV model:

- Risk-free rate = The yields from the Canadian T-bill that matures in the next 15 years from Market insider as April 25.
- Stock volatility is calculated annualy using all daily closed stock prices from 2010 to 2025 provided by Yahoo Finance.
- Asset volatility is calculated using the iteration approach for different time periods. Initial guess is assumed to be equal to the respective annual stock volatility.
- From Yahoo finance, by Dec 31 2024, we used the market cap of 132.88B CAD with total debt 103.01B CAD.

Table 1: Volatility and risk-free rate over 15 years

Year	Risk-free rate	Annualized stock volatility	Estimated asset volatility
1	0.0274	0.138719	0.0797796
2	0.0262	0.224799	0.131644
3	0.0267	0.269207	0.160758
4	0.0276	0.30418	0.185988
5	0.0283	0.358387	0.227176
6	0.0293	0.450046	0.306713
7	0.0301	0.52737	0.390266
8	0.0308	0.55629	0.433134
9	0.0315	0.610433	0.504672
10	0.032	0.633025	0.541675
11	0.0322	0.787199	0.727329
12	0.0322	0.800775	0.750762
13	0.033	0.820834	0.780167
14	0.033	0.836688	0.803205
15	0.033	0.845211	0.817077



CreditMetrics Model

For the CreditMetrics model with two-state Markov transition matrix with constant recovery rate of 50%:

- When there is a gap between the maturities, we will use subsidiary companies corporate bond. And small differences between different maturities of corporate bonds and respective government T-bills are assumed to be not impactful for the yields.
- Since ENB issues corporate bonds in USD, we will use US government T-bills. And all yields are from April 25th, 2025.
- The corporate bond is gathered from TradingView, and T-bills are gathered from Market Insider.

Table 2: Enbridge bonds

Bond name	Maturity date	Yields
ENB4296382	2025-10-15	0.0544
ENB5271981	2026-10-04	0.0459
ENB4513419	2027-07-15	0.0448
ENB5698929	2028-11-15	0.0471
ENB4912102	2029-11-15	0.0478
ENB5698930	2030-11-15	0.0498
ENB3703678	2032-07-15	0.0562
ENB5210531	2033-08-01	0.0529
ENB3706968	2034-12-15	0.0565
ENB3674174	2038-04-15	0.0605
ENB3685015	2040-09-15	0.0598

Table 3: US T-bills

Bond name	Maturity date	Yields
US91282CAQ42	2025-10-15	0.0022
US912828YG91	2026-09-30	0.0391
US91282CKZ31	2027-07-15	0.0377
US912810PZ57	2029-01-15	0.0255
US912828YS30	2029-11-15	0.0385
US91282CAV37	2030-11-15	0.0398
US91282CEZ05	2032-07-15	0.018
US91282CHP95	2033-07-15	0.0414
US91282CLF67	2034-08-15	0.0424
US912810PX00	2038-05-15	0.0442
US912810QK79	2040-08-15	0.0462

For each period, after calculating the spread, we found the geometric average of the spread to be 1.47049% in the next 15 years. So, we have the matrix to be: $M = \begin{bmatrix} 0.97080538 & 0.02919462 \\ 0 & 1 \end{bmatrix}$