Counterparty Risk
Counterparty Credit Risk (CCR) Definition

- Counterparty credit risk refers to the risk that a counterparty to a transaction could fail to fulfill its contractual obligation causing financial loss to the non-defaulting party.
- Counterparty credit risk is bilateral. Both parties could default.
- If one party of a contract defaults, the non-defaulting party will find a similar contract with another counterparty in the market to replace the default one. That is why counterparty credit risk sometimes is referred to as replacement risk.
Counterparty Credit Risk Measures

Credit exposure (CE) is the cost of replacing a contract at default. The credit exposure of a typical interest rate swap is shown below.
Counterparty Credit Risk Measures (Cont’)

- Potential future exposure (PFE): the credit exposure at a specified quantile on a future date.
- Expected exposure (EE): the average (expected) credit exposure on a future target date.
- Expected positive exposure EPE): the weighted average of EE.
- Effective EE is equal to the maximum of EE before time t.
- Effective EPE is the weighted average of Effective EE.
Master Agreement

- Master agreement is a document agreed between two parties, which applies to all transactions between them.
- Close out and netting agreement is part of the Master Agreement.
- If two trades can be netted, the credit exposure is
  \[ E(t) = \max(V_1(t) + V_2(t), 0) \]
- If two trade cannot be netted (called non-netting), the credit exposure is
  \[ E(t) = \max(V_1(t), 0) + \max(V_2(t), 0) \]
Credit Support Annex (CSA) or Margin Agreement or Collateral Agreement is a legal document that regulates collateral posting.

- Trades under a CSA should be also under a netting agreement, but not vice versa.
- It defines a variety of terms related to collateral posting:
  - Threshold
  - Minimum transfer amount (MTA)
  - Independent amount (or initial margin or haircut)
The credit exposure of the interest rate swap after taking CSA into account can be illustrated as
Thanks!

You can find more details at
https://finpricing.com/lib/EqBarrier.html