

# CVaR is Elegant Mathematics but is it useful?

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**Measuring and Managing  
Credit Risk for Energy**

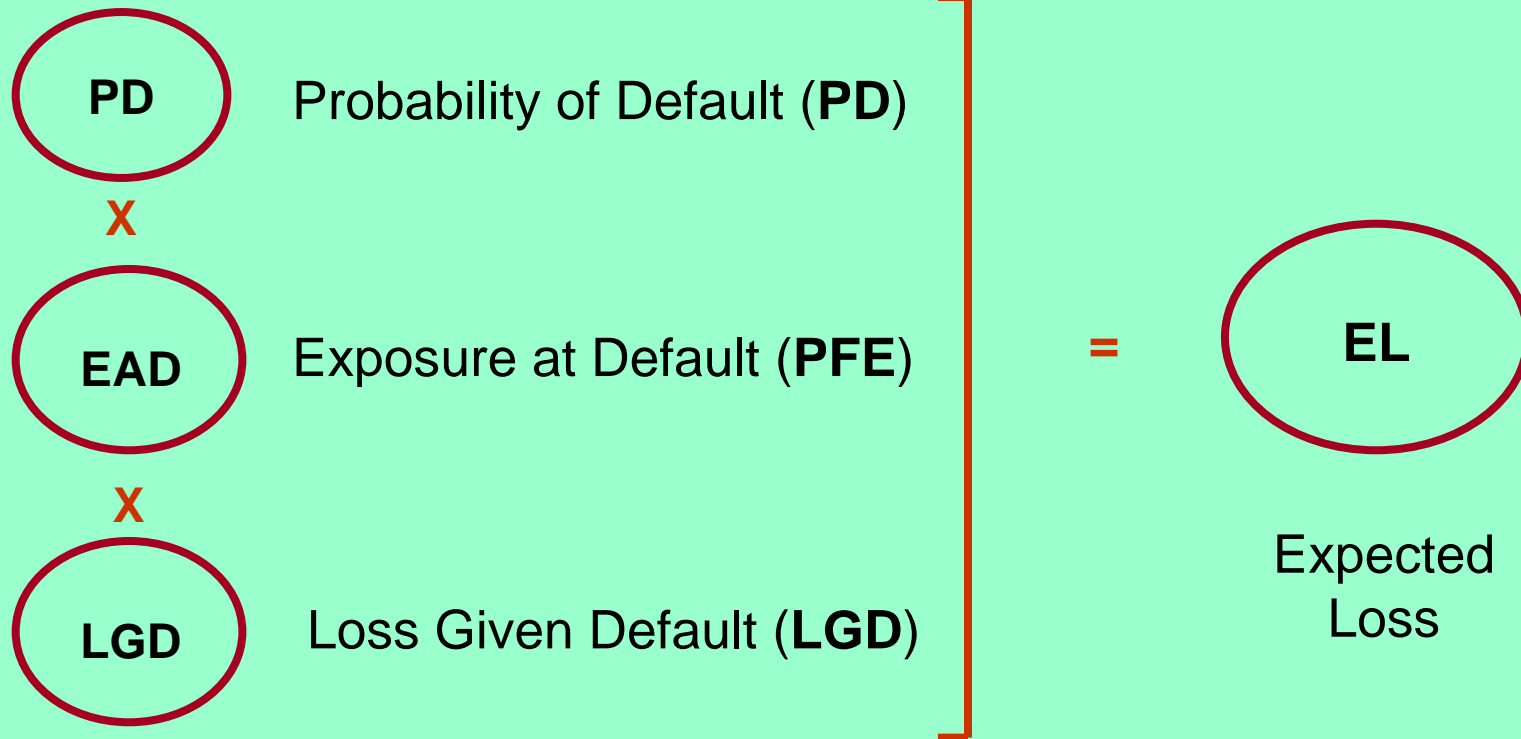
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## VaR and CVaR were invented for Banks as ways to quantify Market and Performance risk related to Financial Derivatives



# Basel II Credit Risk



## Credit Managers Assess and Actively Manage:

- Counterparty Performance Risk
- Counterparty Credit Risk
- Country Risk
- Bank Risk
- Credit Insurer Risk
- Document/Legal Risk
- Portfolio Risk



# When might CVaR be useful?

- Quantifying Performance Risk
  - In a liquid market with volatile prices, what may be lost if a supplier fails to meet future fixed price commitments?
  - In an illiquid market, what may be lost if a supplier fails to meet its future commitments?
  - If a supplier fails to perform, how much compensation will be due?

# Same Applies to Buyers:

- Quantifying Performance Risk
  - In a liquid market with volatile prices, what may be lost if a buyer fails to meet future fixed price commitments?
  - In an illiquid market, what may be lost if a buyer fails to meet its future commitments?
  - If a buyer fails to perform, how much compensation will be due?

# Quantifying Performance Risk:

- Also called Marked-to-Market (m2m) Risk; Value at Risk (VaR) calculations purport to quantify Potential Future Exposure (**PFE**)

**THIS IS THE AMOUNT USED TO CALCULATE REQUIRED MARGIN (COLLATERAL) AND/OR THE AMOUNT NECESSARY TO PROVIDE ADEQUATE ASSURANCE IF INVOKED**

# Quantifying Performance Risk:

- Credit Value at Risk (CVaR) adds consideration of the 'likelihood of failure' or 'Probability of Default' (**PD**)

**THIS IS OFTEN IMPUTED BASED ON S&P TABLES  
USING AN EQUIVALENCE MAPPING OF INTERNAL CREDIT  
RATINGS TO S&P RATINGS**

# Quantifying Performance Risk:

- Credit Value at Risk (CVaR) also adds consideration of the 'loss given failure' or 'Loss Given Default' (**LGD**)

**THIS IS USUALLY ASSIGNED BASED ON COLLECTION DATA  
GATHERED IN RELATION TO DEFAULTED ASSETS IN THE  
SAME ASSET CLASS**

# Who are the majority of 'risky' Suppliers and Buyers for physical energy?

- Emerging Market Producers
- Marginal Producers (Peak or E-friendly)
- Energy Retailers
- Small & Medium Size Industrial and Commercial Consumers

**NOT BANKS**

# VISUALIZE



# VaR ....It is fascinating – really!

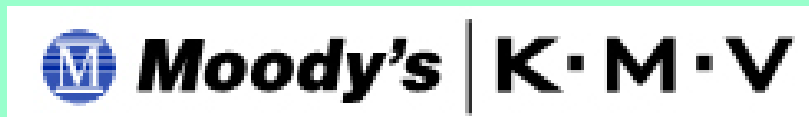
- Probability Theory
- Black-Scholes (Merton 1973 paper)
- Monte Carlo Simulation Method
- Assumptions
- Data Requirements



1997 - Robert C. Merton,  
Myron S. Scholes

## PD ....also has limitations

- Assumptions
- Data Requirements



## LGD ....is myopic

- Assumptions by Asset Class
- Data Requirements



ASSET CLASS:  
E-FRIENDLY FAMILY VEHICLE

# Performance Risk Review:

- Also called Marked-to-Market (m2m) Risk; Value at Risk (VaR) calculations are used by Banks. VaR purports to quantify Potential Future Exposure (**PFE**)
- Credit Value at Risk (CVaR) adds consideration of the 'likelihood of failure' (**PD**) and the 'loss given failure' (**LGD**)

# Performance Risk Assessment

If **CVaR** is not practical and/or not meaningful, is there another way?

# Opportunity Motive & Means

- Is the Counterparty sufficiently hedged to tolerate any foreseeable Potential Future Exposure?
- Is the CP motivated to meet its commitments?
- Will the CP have the financial means to pay?

A red stamp with the text "OM2" inside a red rectangular border, tilted slightly to the right.

# Possible Alternative Method:

- **Scenario Planning** as a basis to estimate the Potential Future Exposure (Opportunity)
- A **Performance Risk ScoreCard** to produce a Probability of Performance Default (Motive)
- A **Recovery Rate Model** to estimate the Loss Given Default (Means)

# Conclusion

VaR and CVaR were invented for derivatives trading (futures) but have been migrated into the physical (forward) world where they are only useful in the macro sense. That is for understanding overall trading positions, and the risk profile of portfolios.

In the micro sense, when examining performance risk counterparty by counterparty, more appropriate and useful tools need to be invented.

That is our challenge.....