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PRIMIA Presentation

Proactive Portfolio Management and Hedge Methodology

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Portfolio Risk Management & Hedging on a Portfolio Basis - Some Basic Points

- Portfolio – a collection of assets & liabilities that needs to be managed over a particular time horizon in order to achieve some business objective
- Assets (or positions) – physical assets, financial contracts, commodity contracts, service contracts, other credit / financing contracts, labor, other contracts
  - Intended to facilitate businesses the ability to achieve their objectives
- The liabilities (claims) components - forward commodity contracts (sales), bonds, other loan repayments, other credit/financing contracts, labor, other performance contracts to which the firm is obliged
- Multiple objectives may have conflicting requirements thus constraining the Portfolio manager as to potential actions that can be taken

Portfolio Risk Management & Hedging on a Portfolio Basis - Some Basic Points - continued

- Identification of different sources of value and risk driving the dynamics of the entire portfolio
  - Value and risk drivers are often subject to complicated sources of uncertainty
- Increases the challenges of managing the portfolio and achieving goals

Challenges With Energy Markets – Nat Gas, Power, Coal

- Compare and contrast with Financial and/or Agricultural markets
  - Power/Nat Gas/Coal are “hybrid” markets
  - Regulated utilities and pipelines
    - Regional monopolies with regulated returns subject to oversight and control
  - Merchant Energy businesses
    - Able to compete with utilities due to wholesale/retail market mechanisms that gradually dilute utilities advantage
  - Rules of competition all subject to oversight
- “Regulated” utility sector appears different
  - Some firms own gen assets and load obligations
  - Others serve as wires or distribution companies with load commitments but no generation assets
- Obligations met through competitive auctions
  - As a result, service territories are protected
- Mix of players → Focus and tool sets can vary across actors

Challenges with Energy Markets - continued

- Further complication – lack of market depth
- Lack of "richness" in hedge contracts available
  - For example, lack of standard contracts that are actively traded on exchanges
  - Market fragmentation – "locational" risk often cannot be offset by "correlated" products
  - Limited forward tenors available for a forward looking portfolio management strategy
- Lack of market transparency
- Lack of a robust price discovery process
- Improvements would greatly aid markets, regulators and market participants
- High level of credit risk capital required for active portfolio management
  - Function of participant financial status
  - Exacerbated by asymmetries as related to margining for load serving deals

Active Portfolio Management in a Difficult Environment - Why Bother?!

- Opportunities for innovative approaches
  - Structuring complex transactions designed to mitigate specific risks
  - Creating institutions for pooling market prices signals
  - Efficient mechanisms to pool credit risk obligations
  - Entering into well designed clearing arrangements

Elements of Risk Management In Asset-Centric Companies

- The objective of risk management is to manage the Gross Margin (GM) around a set of targets
- This requires determining acceptable tolerance bands around the targets and hedging to stay within these bands
- In the case of trading, the tolerance bands typically consist of VaR Limits with appropriate holding/liquidity periods to account for market conditions.
- In the case of asset based businesses, setting of tolerance bands and management of risk is complicated by the following factors:
  - the economic lives of the assets are very long
  - assets are rarely to be liquidated/disposed of and therefore the notion of liquidation periods is incorrect
  - the ability to hedge exposures is constrained by market structures and available instruments
  - the economic valuation and representation of the assets and hedges often differs from the Financial or GAAP acceptable representations.

Elements of Risk Management In Asset-Centric Companies - continued

- Risk management tolerance bands are set in terms of variation around the GM over a management defined tenor/term of the asset's economic life and associated hedges over similar term(s)
- Gross Margin at Risk (GMaR) - the lower bound for the GM at some confidence level
- Risk management consists of managing the GM from the assets subject to a set of GMaR limits organized along asset, portfolio and tenor dimensions.
- The impact of hedging activities can be discussed in terms of the reduction of the GMaR
- GMaR is an economic construct and there will need to be a reconciliation with GAAP acceptable earnings

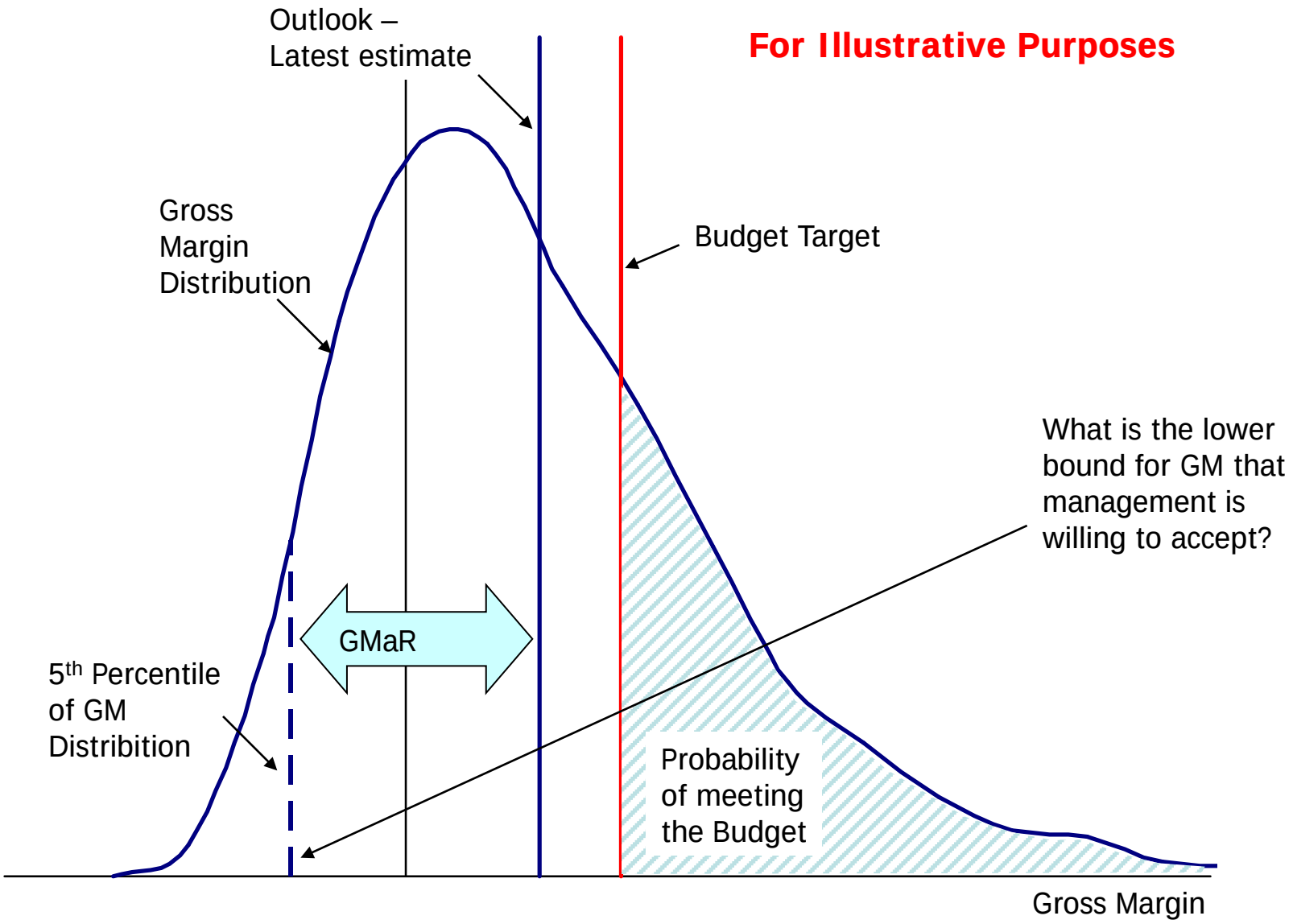
Elements of Risk Management In Asset-Centric Companies - continued

- GMaR is therefore more than “just another risk metric.” It is a measure which can be employed to:
  1. compare Current GM Outlook or latest Budget Plan
  2. Provide a measure of the potential downside to the Current GM Outlook or latest Budget Plan
  3. Help provide an estimate of the current probability of meeting the Budget
  4. Enable a ranking of alternative hedging strategies in terms of effectivenss in reducing risk

Focus–Portfolio Management & Hedge Strategy–Merchant Generator

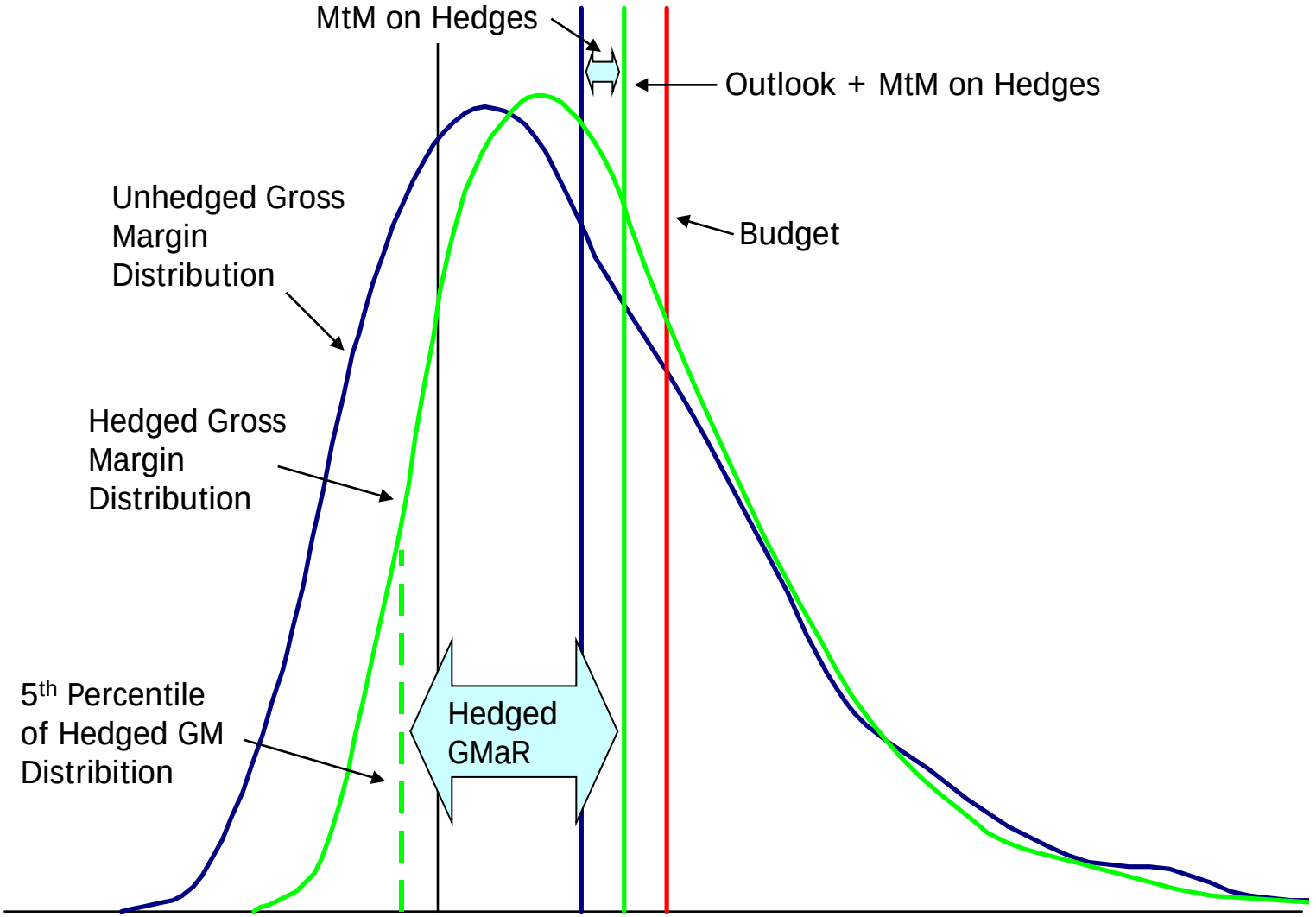
- Reward – expected GM
- Risk – GMaR
- Focus on Market Price driven rewards/risks
  - Rather than operational or credit arrangement driven
- Setting: Coal generation over a 3-4 year rolling window with reasonably liquid markets and hedge instruments available
- Asset Valuation Model (AVM)
  - Constrained dispatch model for the fleet
  - Hedge instruments
    - Standard blocks of power
    - Negotiated coal and transportation agreements
    - Full-requirements load serving

GM and GMaR (Reward and Risk)
(Unhedged) Asset Gross Margin Distribution



Impact of Hedges - GM and GMaR of Hedged Asset-Distribution

For Illustrative Purposes



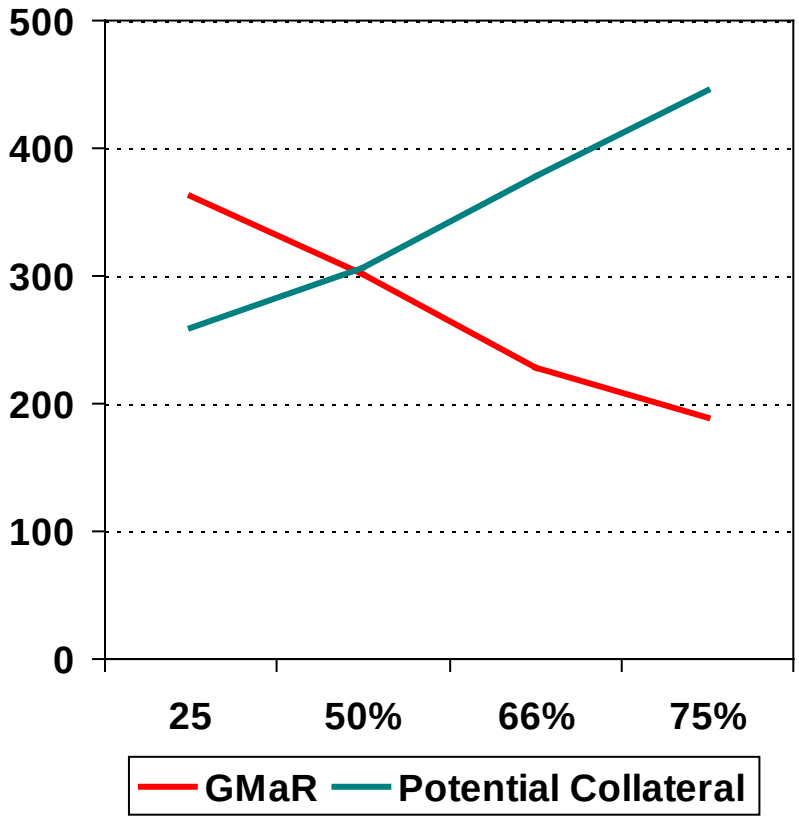
Additional Benefit/Usage of the GM/GMaR Framework:

Trade-Off Between Additional Potential Collateral And Risk Reduction

For Illustrative Purposes

99% CL $ MM	GMaR	Potential Collateral
25%	362	260
50%	302	306
66%	228	378
75%	189	445

Potential Collateral vs. Gross Margin-at-Risk Trade-Off (99% CL)



Risk Reduction Versus Incremental Liquidity Demand Trade-off

Evaluation Date: mm/dd/yy

Year	GM	Current GM@R	GM@R w/ Proposed Hedges	Δ Reduction in GM@R	Current MPE* Estimate	Expected Date of peak	MPE* with proposed Hedges	Expected Date of peak	Δ In MPE* (column (8) – (6))
Year 1					(column 6)		(column 8)		
Year 2									
Year 3									
Total:				A					B

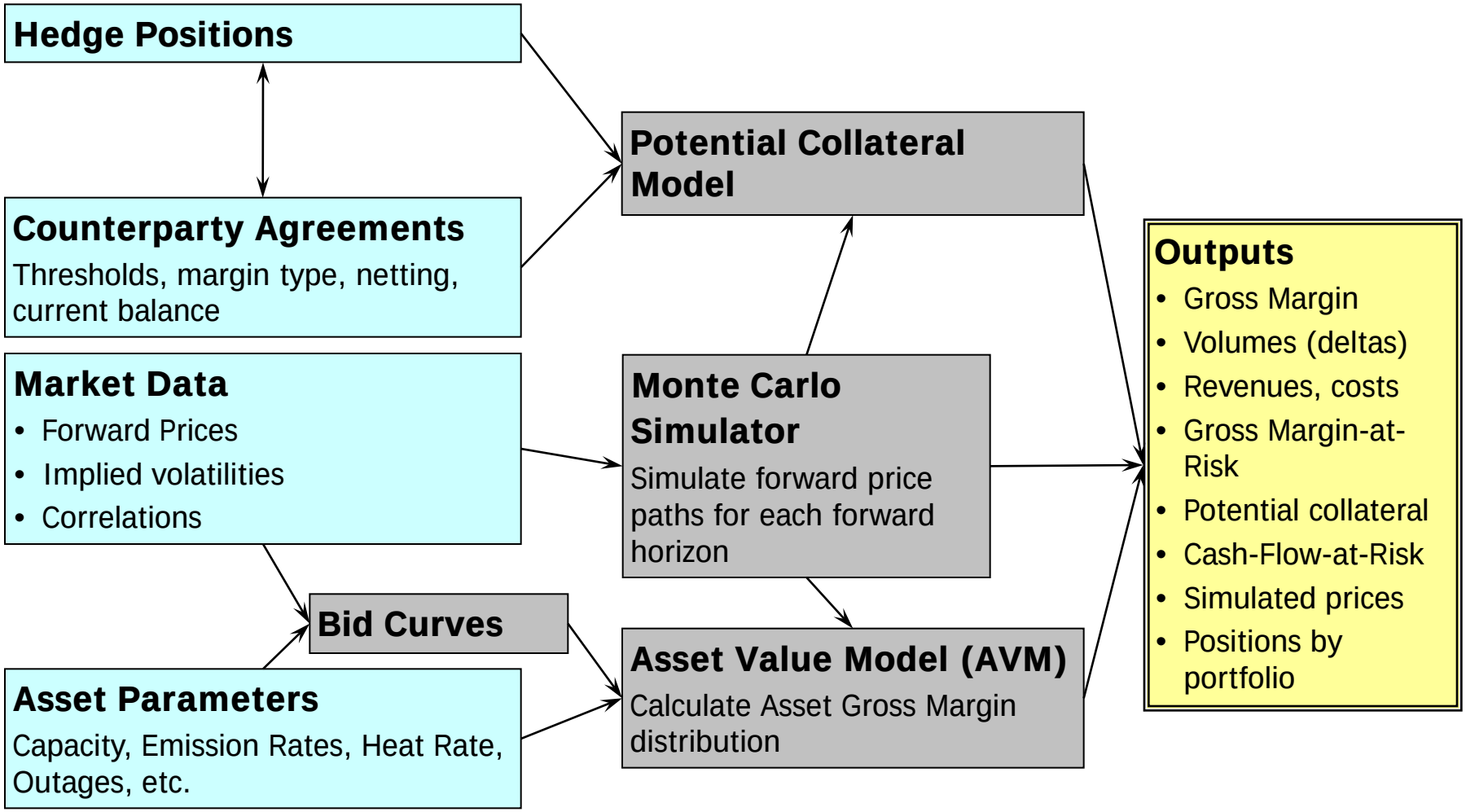
GM@R Reduction / MPE Increase Trade Off

$$\Xi \quad \frac{\Delta \text{ GM@R}}{\Delta \text{ MPE}} \quad = \quad \frac{A}{B}$$

Note: Lien-backed transactions will not increase the max potential collateral and the trade-off ratio goes to infinity. On the other side, we may get a "haircut" on the MtM gross margin.

Note: MPE* can be Gross or Net Cash Flow Based (i.e. account for offset with Asset value improvement)

AVM, GMaR, and Potential Collateral Demand – An Integrated Framework



Some Framework Detail

- AVM values our coal fleet. It captures:
  - Merchant Strategy: Bid price different from cost
  - Operating strategy: Shut down or run when losing money?
  - Asset parameters come from Plant Operations Group
- AVM uses Monte Carlo to value the capacity between min and max load as a strip of four-legged* European spread options that exercise at bid, but profit at cost
- Volatility:
  - Gas volatility is implied from Henry Hub option prices
  - Power volatility is extended from Exchange and Broker quotes
  - Coal volatility is extended from option prices
- Correlations are based on historical forwards
- Hedge positions
- Counterparty agreement data

* Power, coal, SO2 and NOx

GM, GM@R and Potential Collateral Report

GMaR and Potential Collateral are at 95% confidence level ($ Million)

Effective Date: 3/4/09

Portfolio	GM 2010	GM 2011	GM 2012	GM@R 2010	GM@R 2011	GM@R 2012	GM@R Total	Max Potential Collateral
Unhedged Portfolio 1				156	270	330	684	
Portfolio 1 + Hedges				94	197	320	552	116
Percent Hedged				39%	27%	3%	19%	
Unhedged Portfolio 2				76	124	181	342	
Portfolio 2 + Hedges				46	101	181	274	50
Percent Hedged				40%	19%	0%	20%	
Unhedged Portfolio 3				34	48		82	
Portfolio 3 + Hedges				9	18		25	26
Percent Hedged				75%	63%		69%	
Unhedged Portfolio 4				3	4		7	
Portfolio 4 + Hedges				3	4		7	
Percent Hedged				0%	0%		0%	
Unhedged Portfolio 5				8	17		25	
Portfolio 5 + Hedges				8	17		25	
Percent Hedged				0%	0%		0%	
Unhedged total Assets				208	353	464	927	
Total Portfolio + Hedges (incl. MWG)				147	263	454	772	130
Percent Hedged				29%	25%	2%	17%	

Limits / Controls / Authorities

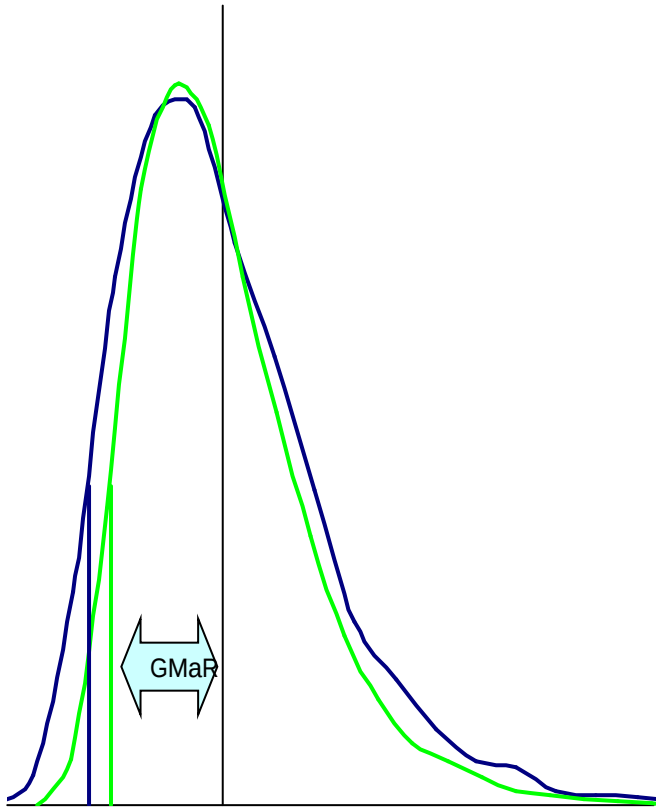
Controls

1. Periodic meetings with Commercial team, Risk team, Management

Limit and Authorities

1. GMaR
2. Liquidity
3. Approved products
4. Individual trade tenors, size, VaR, etc.

Hedged vs. Unhedged GMaR Distribution



A Holistic Approach to Optimal Portfolio Risk Management- A GM/GMaR Framework

GM_m^U - Upper Bound/Stretch Target Gross Margin for interval *m*, say at 120% of Base Case/Budget Gross Margin for the same period/interval *m*

GM_m^B - Budget or Base Case Gross Margin Target for the period/interval *m*

GM_m^L - Lower Bound/Stress Case Gross Margin Target for interval *m*, say at 80% of Base or Budget Gross Margin target for the same period/interval *m*

GM_m^a - Actual Gross Margin for the period/interval *m*

$GMaR_m^a$ - Actual Gross Margin at Risk for the period/interval *m*

Note IV: The Stretch Target Level as well as the Lower Bound or Stress target Level of the *GM*s can be set as functions of the Budget or Base Case Level employing the *GMaR* metric as a suitable yard-stick

$GM_m^{CI} \equiv GM_m^a - GMaR_m^a$: The Actual risk adjusted Gross Margin for the period m at the level of Confidence employed for the *GMaR* estimate(s)

Numerical Example:

Gross Margin and Risk adjusted Gross Margin Levels and Triggers	$GM_m^a > GM_m^U$	$GM_m^U > GM_m^a > GM_m^B$	$GM_m^B > GM_m^a > GM_m^L$	$GM_m^L > GM_m^a$
$GM_m^{CI} > GM_m^U$	• great margin • good risk	Infeasible	Infeasible	Infeasible
$GM_m^B \leq GM_m^{CI} < GM_m^U$	• great margin • acceptable risk	• good margin • acceptable risk	Infeasible	Infeasible
$GM_m^L \leq GM_m^{CI} < GM_m^B$	• Great margin • Too much risk	• good margin • too much risk	• margin too low • too much risk •	Infeasible
$GM_m^{CI} < GM_m^L$	• great margin • too much risk	• good margin • too much risk	• margin too low • too much risk	• margin too low • too much risk

Asset Portfolio Hedging Using Options

- Challenge – Optimal mix of hedge instruments
- Possible constraints – management risk appetite
  - Can instruments beyond straightforward forward purchase and sales be used?
- When markets are near historical lows or highs then Options should be considered
- It is possible to select a strategy that can help limit the downside while also offering upside protection
- Problem(s):
  - breadth and depth of market and size of premium
  - What is the accounting treatment?
  - Will option hedges need to be marked-to-market?
  - Shortness of tenors available, coarseness of time blocks, commodity type and locational differentials