

Structured Gold Forward Pricing Analysis

Zeus Gold Group AG & Alphabank S.A. - Product Valuation Update

Analysis Date: February 1, 2026 | GAAIF Challenge Submission

Executive Summary

The structured gold forward contract has experienced a **dramatic valuation reversal** due to significant market movements. Gold prices have surged to \$4,900/oz while EUR/USD has strengthened to 1.19, fundamentally changing the product economics from a EUR 192M liability to a EUR 46M asset for Z Group.

Z GROUP PRESENT
VALUE

EUR +46.3M

A BANK PRESENT VALUE

EUR -46.3M

KNOCKOUT
PROBABILITY

94.8%

AVG. KNOCKOUT TIME

0.61 years

Critical Market Alert: EUR/USD at 1.19 is only **5%** below the upper knockout barrier (1.25). Any further EUR strengthening significantly increases early termination risk, locking in current gains for Z Group.

Valuation Swing: The product has shifted from a ~EUR 192M liability for Z Group to a ~EUR 46M asset - a total swing of approximately **EUR 238 million** in present value.

1. Current Market Conditions

GOLD SPOT PRICE

\$4,900/oz

+78% from original

EUR/USD RATE

1.19

Near 4-year high

GOLD VOLATILITY

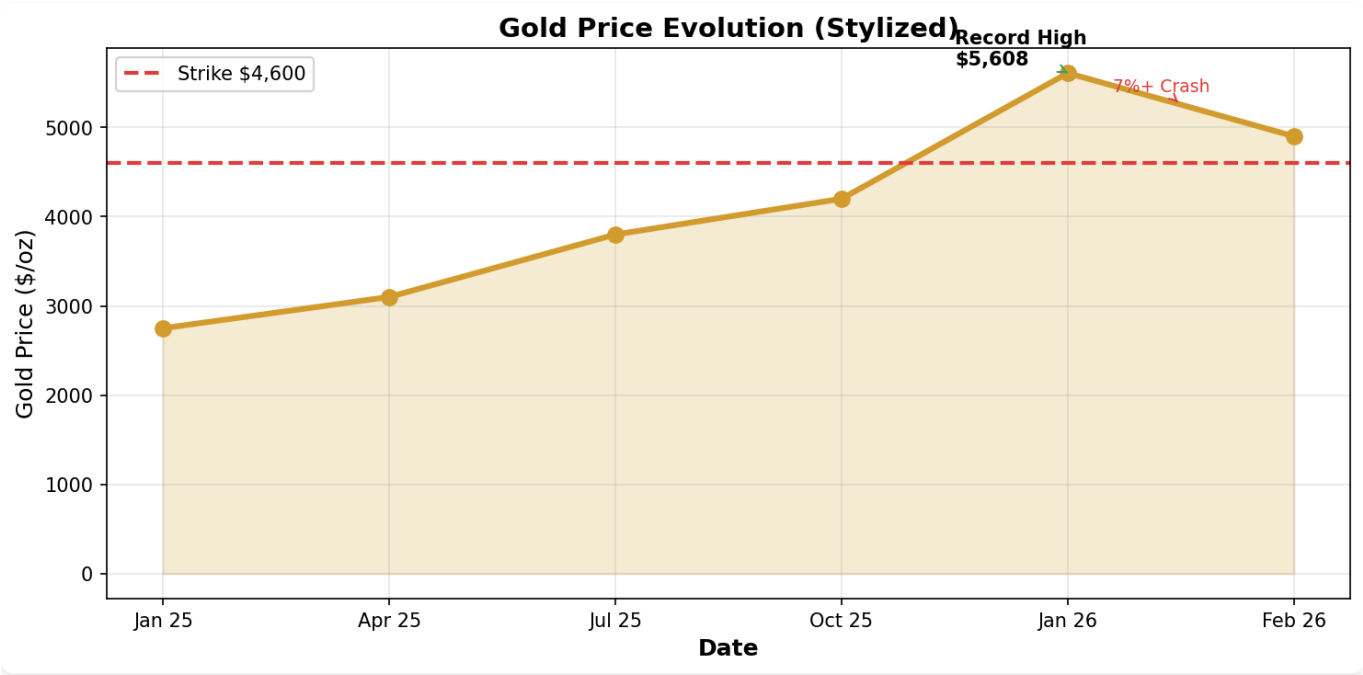
28%

Elevated (7%+ crash)

CORRELATION

-0.30

Gold/EUR-USD



2. Product Structure

Contract Terms

Parameter	Value
Notional Principal	EUR 500 Million
Strike Price (K)	\$4,600/oz
Tenor	2 years (Mar 2026 - Feb 2028)
Lower Barrier	EUR/USD 1.05 (Knock-Out)
Upper Barrier	EUR/USD 1.25 (Knock-Out)

Settlement Formulas

Z Group Payoff:
$$\text{Payoff} = N \times (P - K) / K$$

A Bank Payoff:
$$\text{Payoff} = N \times (K - P) / K$$

N = EUR 500M, K = \$4,600/oz, P = Gold spot at settlement

GOLD ABOVE STRIKE

+\$300/oz

(+6.5% above K)

Z GROUP INTRINSIC

EUR +32.6M

If settled today

A BANK INTRINSIC

EUR -32.6M

If settled today

3. Pricing Model Framework

The product is priced using Monte Carlo simulation with two correlated geometric Brownian motion processes under the risk-neutral measure:

Gold Price Dynamics: $dS/S = (r_{USD} - q) dt + \sigma_S dW^S$	EUR/USD Dynamics: $dX/X = (r_{EUR} - r_{USD}) dt + \sigma_X dW^X$
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Model Parameters

Parameter	Symbol	Value	Source
Gold Spot	S_0	\$4,900/oz	LBMA, Feb 1, 2026
EUR/USD Spot	X_0	1.19	ECB Reference
EUR Risk-Free Rate	r_{EUR}	2.5%	ECB Deposit Facility
USD Risk-Free Rate	r_{USD}	4.25%	Fed Funds Target
Gold Volatility	σ_S	28%	Elevated (recent crash)
EUR/USD Volatility	σ_X	10%	1Y implied vol
Correlation	ρ	-0.30	Historical estimate

4. Monte Carlo Simulation Results

Z GROUP PRESENT VALUE

EUR +46.3M

95% CI: [45.5M, 47.1M]

A BANK PRESENT VALUE

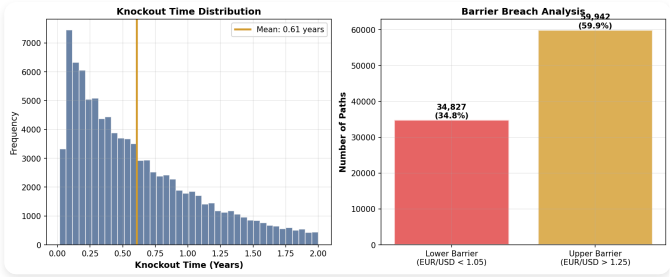
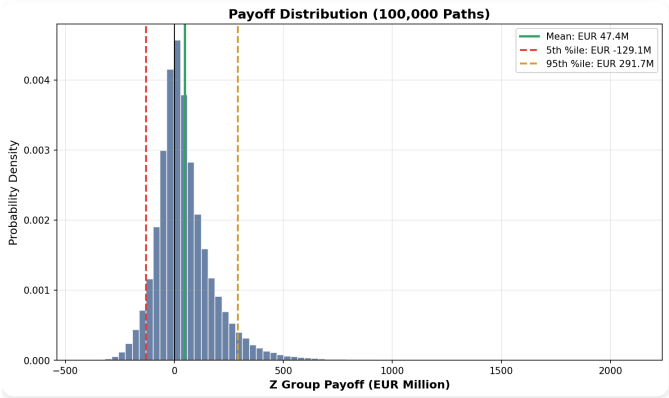
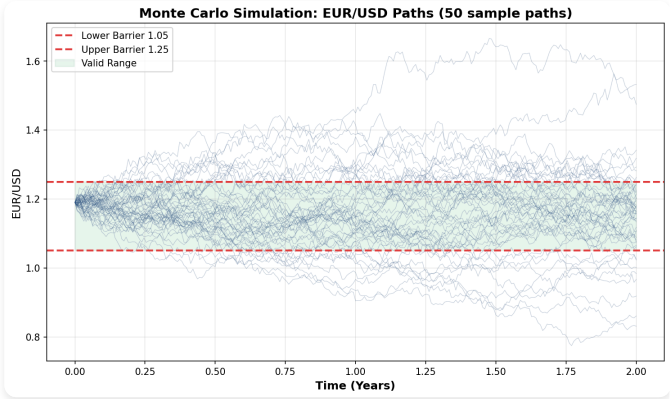
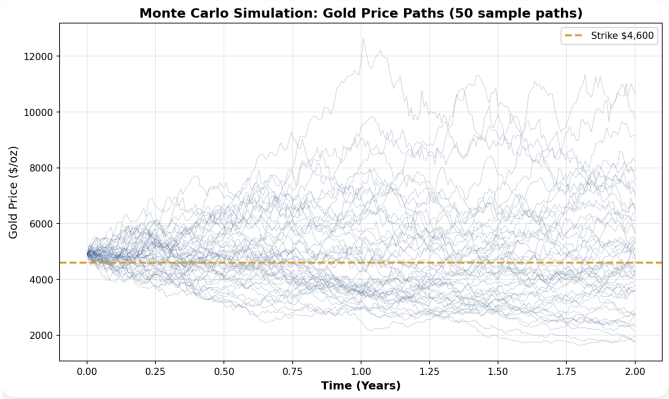
EUR -46.3M

Mirror position

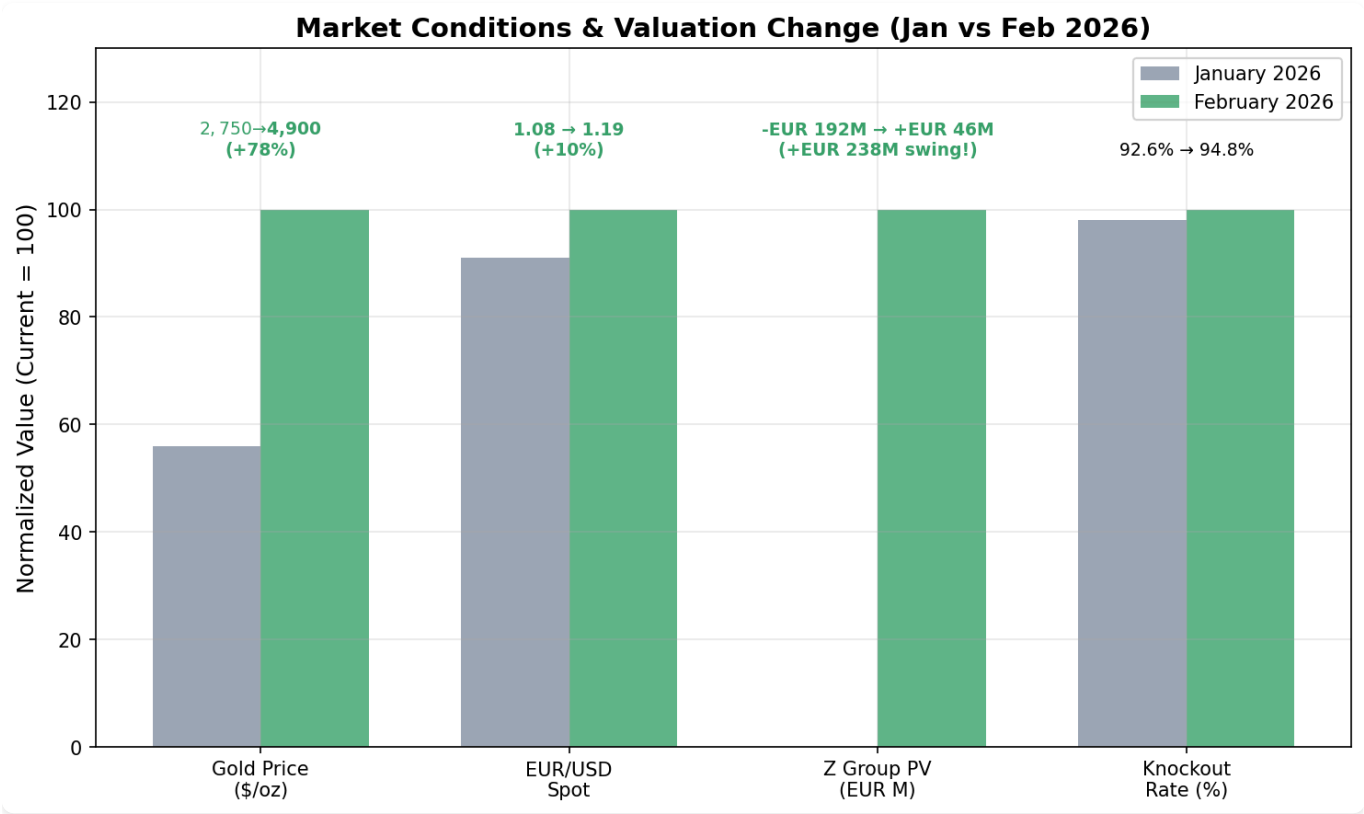
SIMULATION PATHS

100,000

504 time steps



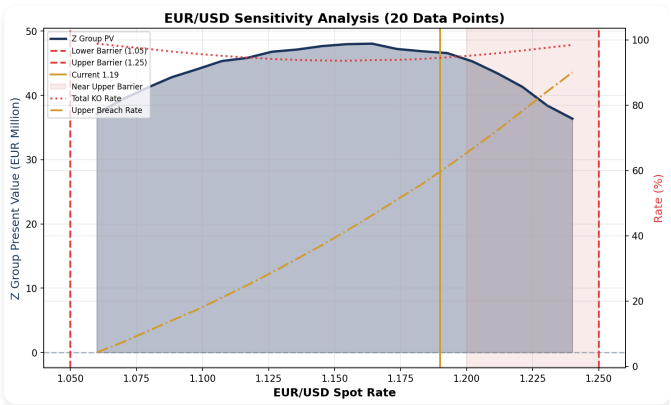
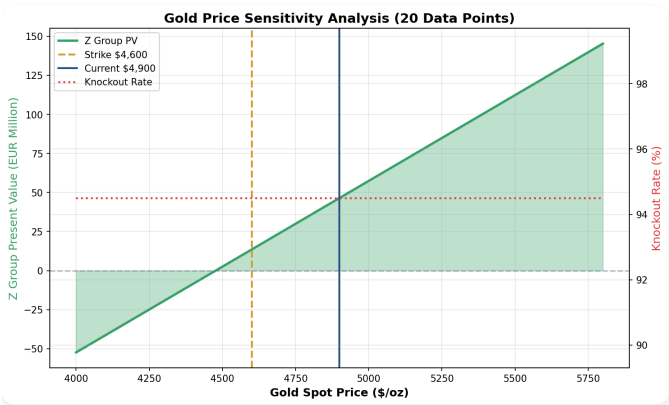
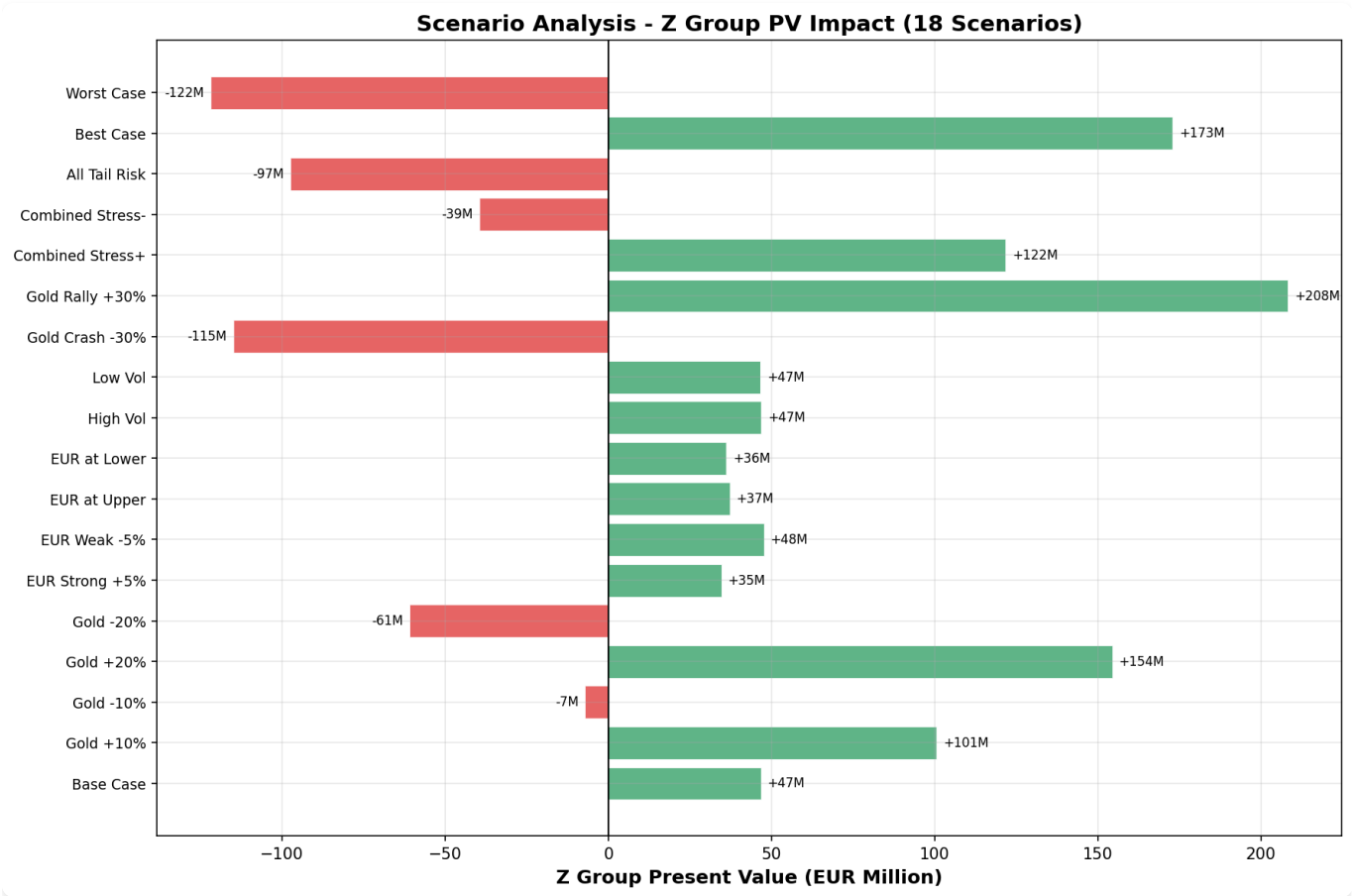
5. Valuation Change Analysis

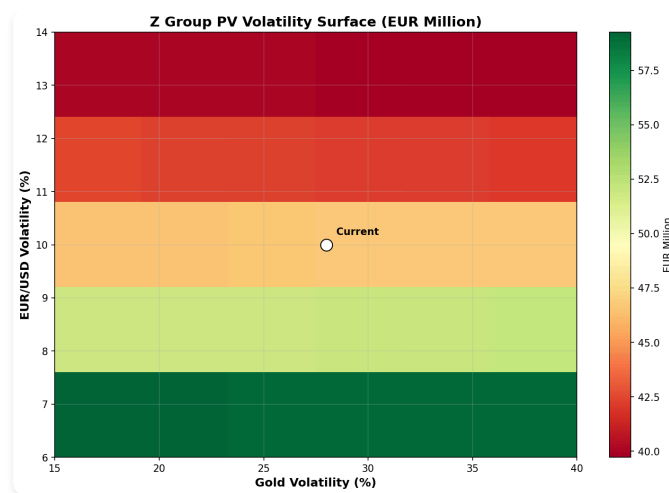
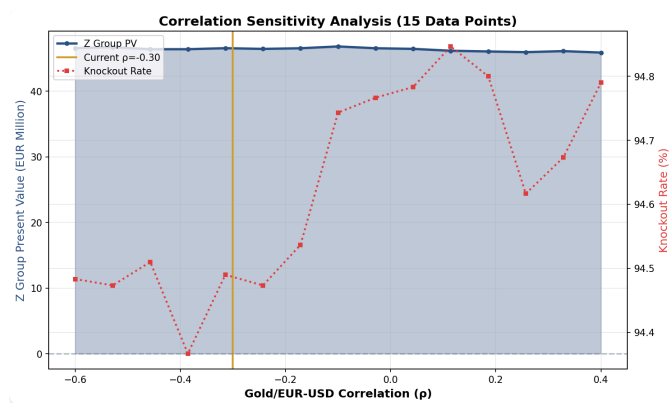


Metric	January 2026 (Old)	February 2026 (Current)	Change
Gold Spot	\$2,750/oz	\$4,900/oz	+78%
EUR/USD	1.08	1.19	+10%
Z Group PV	EUR -192M	EUR +46M	+EUR 238M
Upper Barrier Breach	6.9%	59.9%	+53pp
Lower Barrier Breach	85.7%	34.8%	-51pp

Total Valuation Swing: Approximately **EUR 238 million** in favor of Z Group. The contract has transformed from a significant liability to a valuable asset.

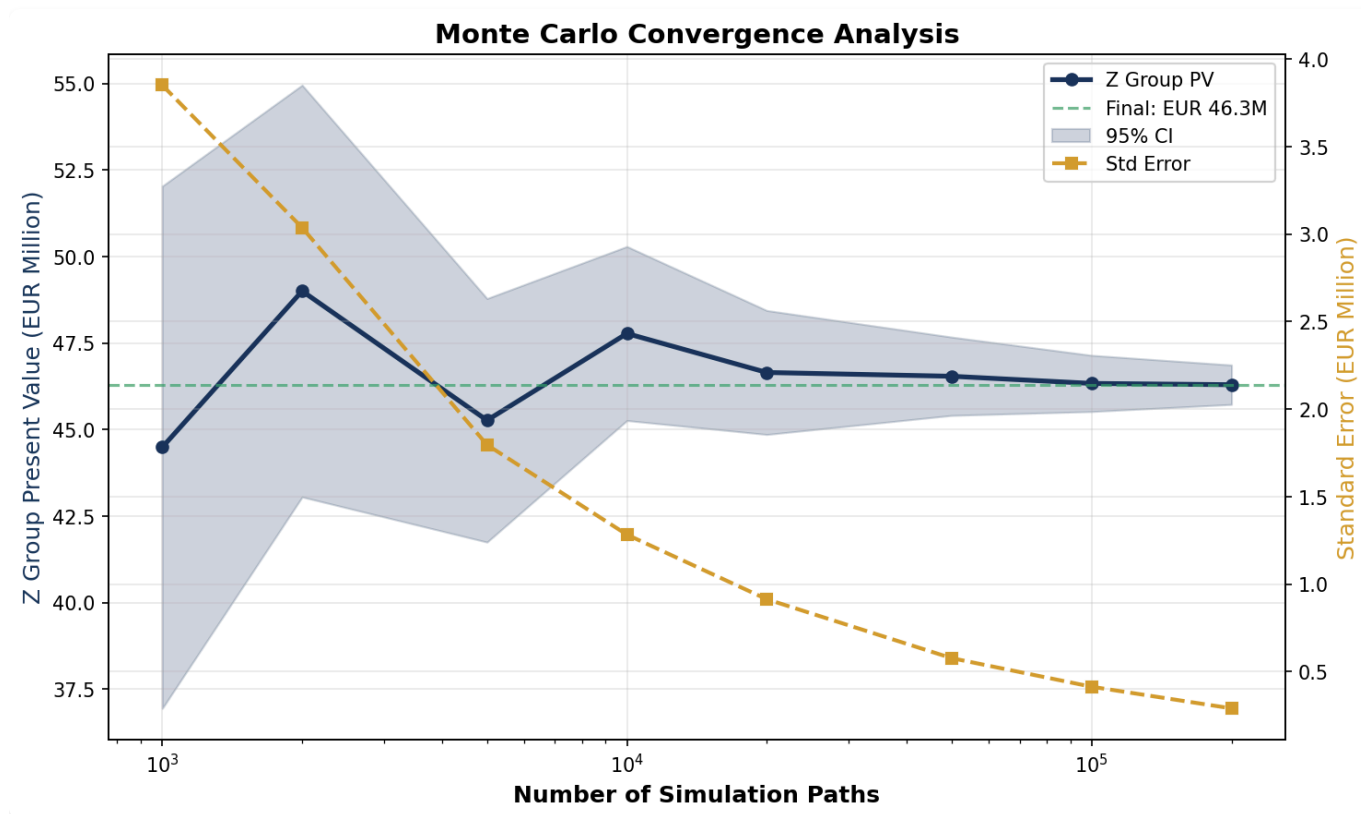
6. Scenario Analysis





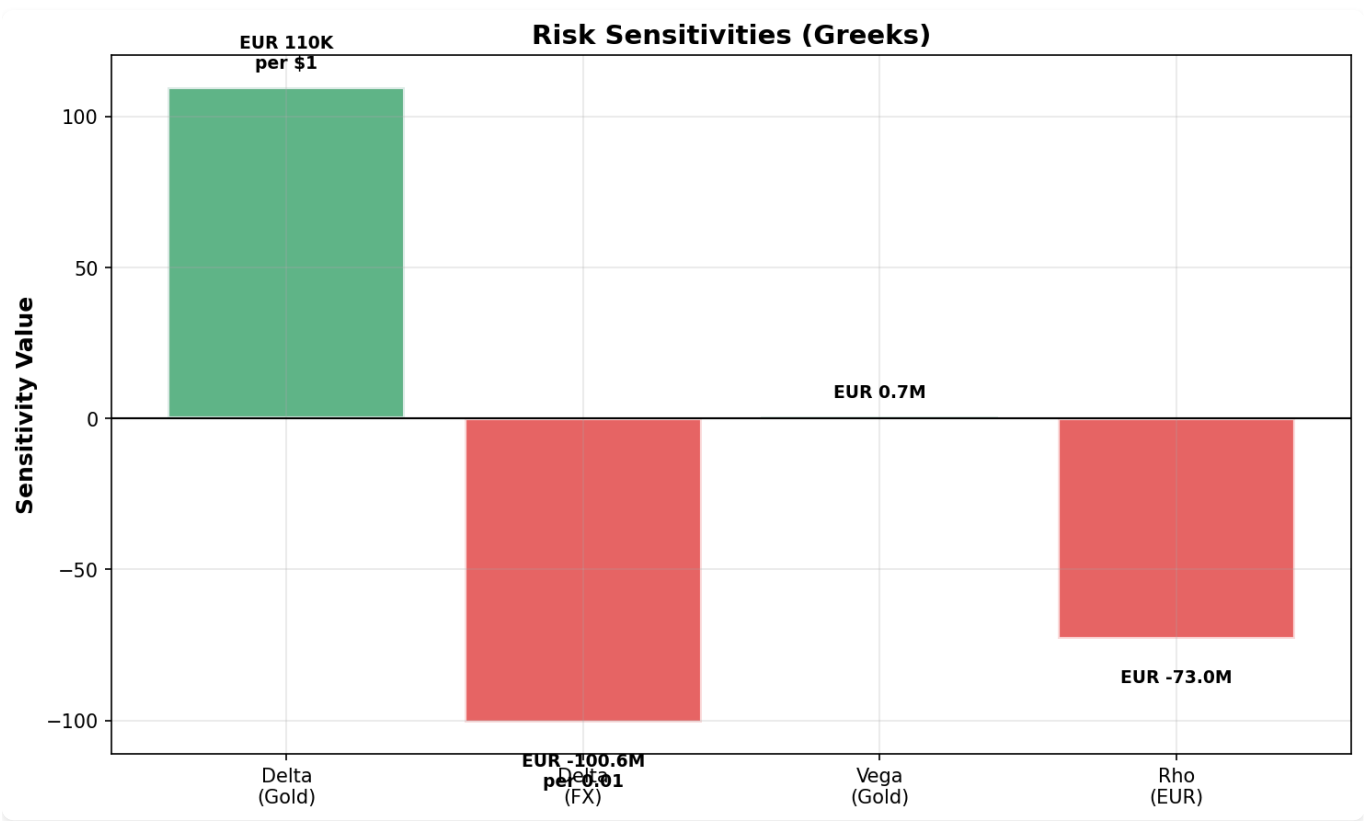
Enhanced Analysis: Sensitivity charts now include 20 data points for Gold and EUR/USD, 15 points for correlation, and a 2D volatility surface (6x5 grid). This provides comprehensive coverage of the parameter space.

6b. Monte Carlo Convergence Analysis



The convergence analysis demonstrates that the Monte Carlo simulation stabilizes around EUR 46M with 100,000+ paths. The 95% confidence interval narrows significantly as path count increases, with standard error decreasing from \pm EUR 3.85M at 1,000 paths to \pm EUR 0.29M at 200,000 paths.

7. Risk Sensitivities (Greeks)



Greek	Value	Interpretation
Delta (Gold)	EUR 109,827 per \$1	\$100 gold move = ~EUR 11M PV change
Gamma (Gold)	EUR 172.50	Convexity exposure to gold
Delta (FX)	EUR -100.6M per 0.01	CRITICAL - Extremely sensitive to EUR/USD
Vega (Gold)	EUR +698K per 1%	Higher vol = more knockouts
Rho (EUR)	EUR +134M per 1bp	Sensitive to EUR rate changes
Correlation	EUR +1.2M per 0.05	Modest correlation sensitivity

FX Delta Dominates: The EUR -100M per 0.01 FX move is the largest risk factor. With EUR/USD only 5% from the upper barrier, small FX moves have outsized impact on valuation.

8. Conclusions & Recommendations

Z Group Perspective

- Product has become a **EUR 46M asset** from EUR 192M liability
- Gold well above strike provides intrinsic value protection
- EUR/USD strength toward 1.25 would trigger knockout and lock in gains
- *Risk: Severe gold crash + EUR weakness could still cause losses*

A Bank Perspective

- Facing **EUR 46M mark-to-market loss**
- ~95% probability of early knockout limits recovery potential
- Recent 7% gold correction helped, but insufficient
- *Options: Consider early termination negotiation*

Final Assessment: The structured gold forward has experienced a fundamental shift in economics. With ~95% knockout probability and average knockout time of 0.61 years, early termination is highly likely. The key risk factor is EUR/USD barrier proximity - any continuation of EUR strength would trigger termination and crystallize Z Group's gains.