

# 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%**

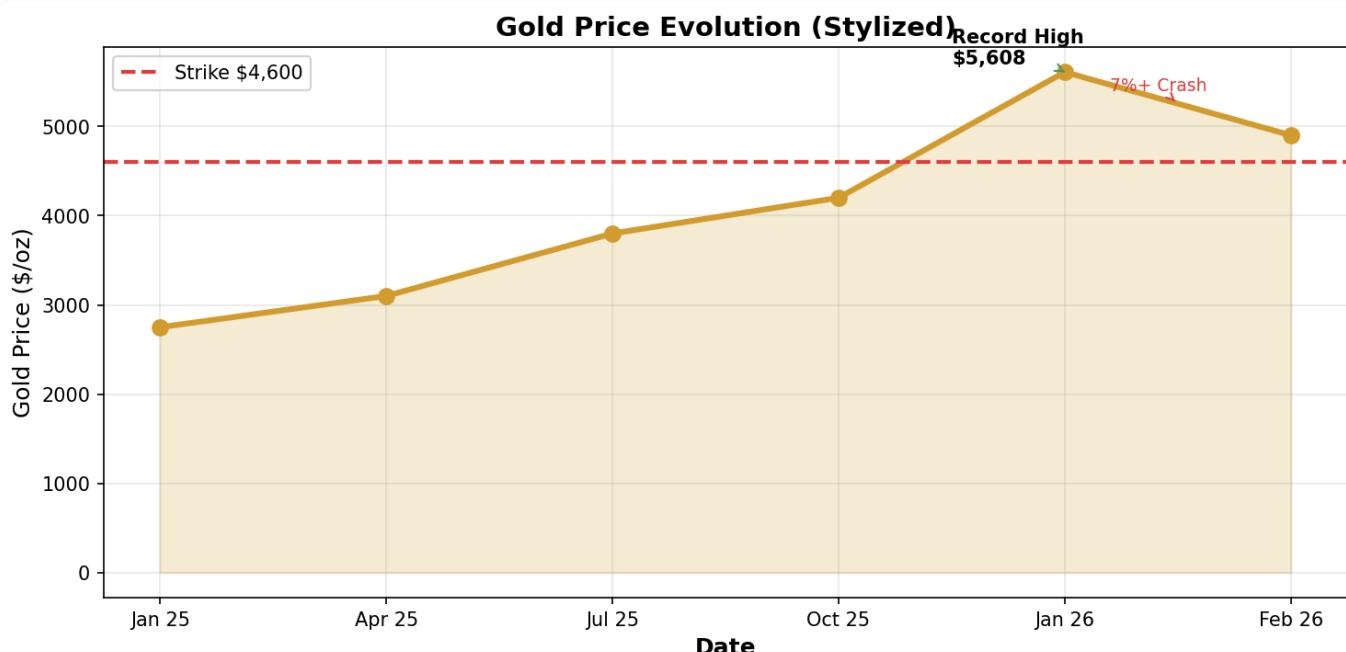
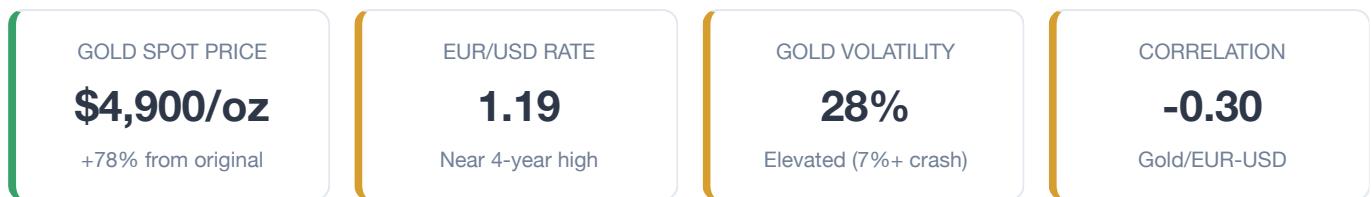
AVG. KNOCKOUT TIME

**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



## 2. Product Structure

### Contract Terms

Parameter	Value
Notional Principal	<b>EUR 500 Million</b>
Strike Price (K)	<b>\$4,600/oz</b>
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



### 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:**

$$dX/X = (r_{EUR} - r_{USD}) dt + \sigma_X dW^X$$

#### 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	$\sigma_S$	28%	Elevated (recent crash)
EUR/USD Volatility	$\sigma_X$	10%	1Y implied vol
Correlation	$\rho$	-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

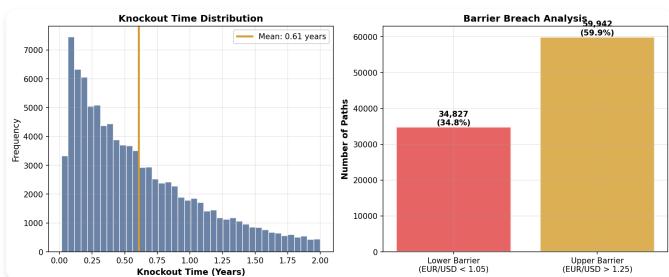
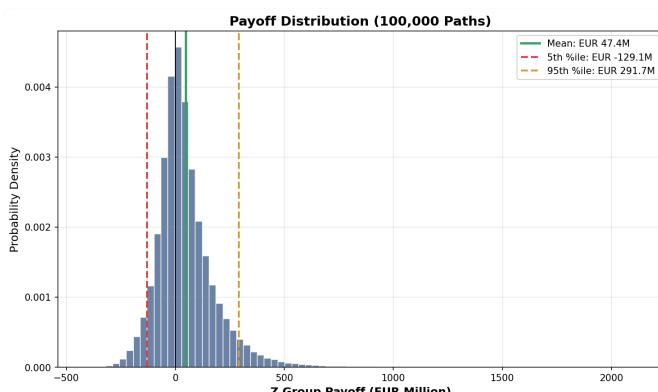
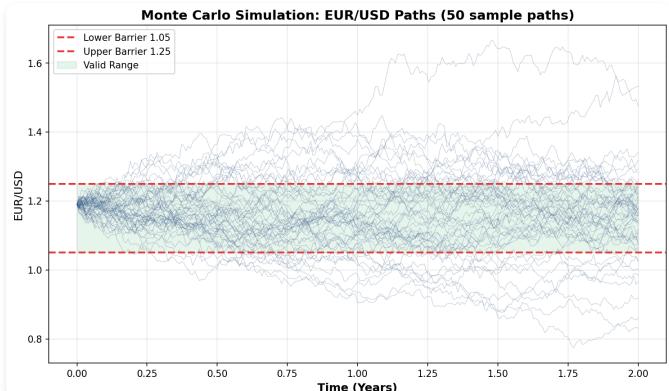
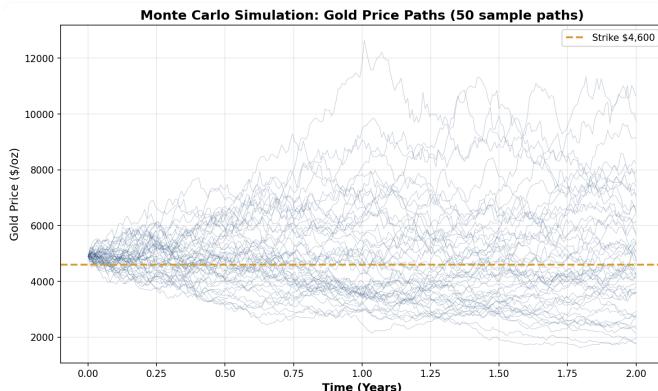
**EUR -46.3M**

Mirror position

SIMULATION PATHS

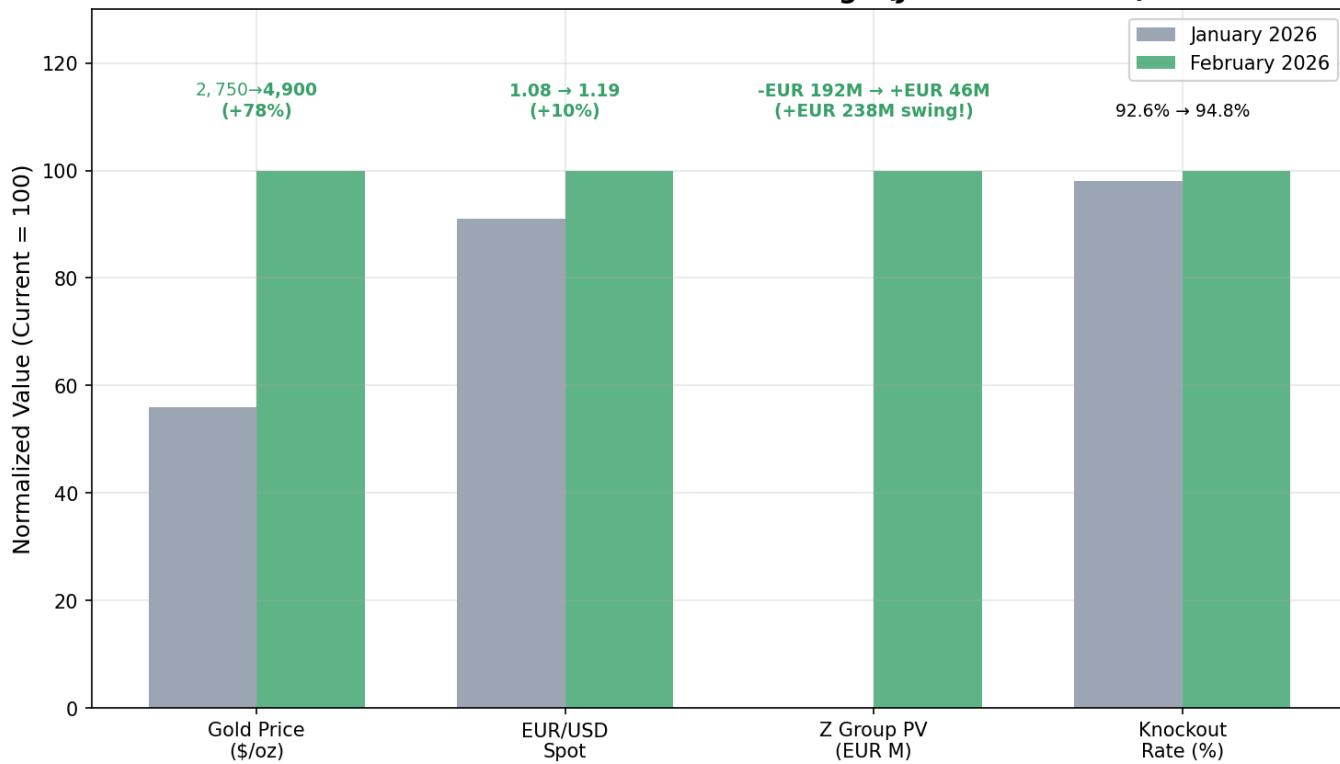
**100,000**

504 time steps



## 5. Valuation Change Analysis

Market Conditions & Valuation Change (Jan vs Feb 2026)

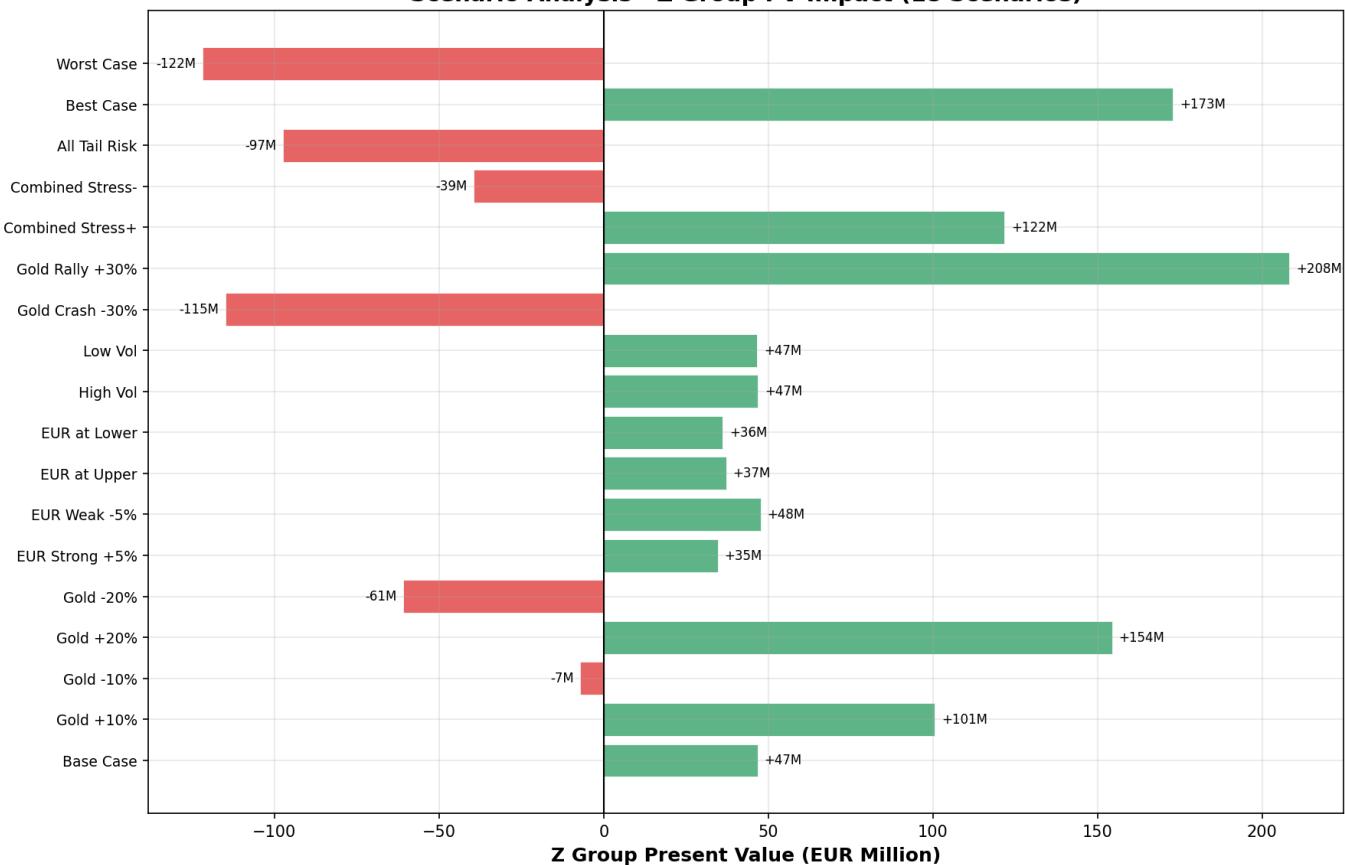


Metric	January 2026 (Old)	February 2026 (Current)	Change
Gold Spot	\$2,750/oz	\$4,900/oz	+78%
EUR/USD	1.08	1.19	+10%
Z Group PV	EUR -192M	EUR +46M	+EUR 238M
Upper Barrier Breach	6.9%	59.9%	+53pp
Lower Barrier Breach	85.7%	34.8%	-51pp

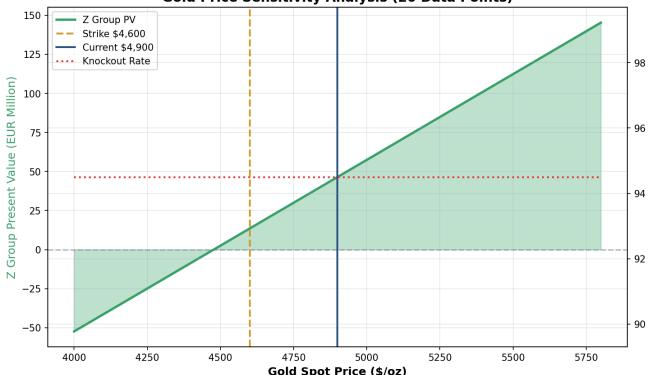
**Total Valuation Swing:** Approximately **EUR 238 million** in favor of Z Group. The contract has transformed from a significant liability to a valuable asset.

## 6. Scenario Analysis

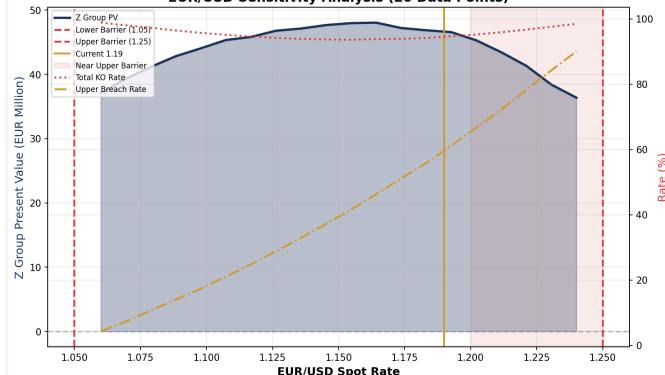
Scenario Analysis - Z Group PV Impact (18 Scenarios)

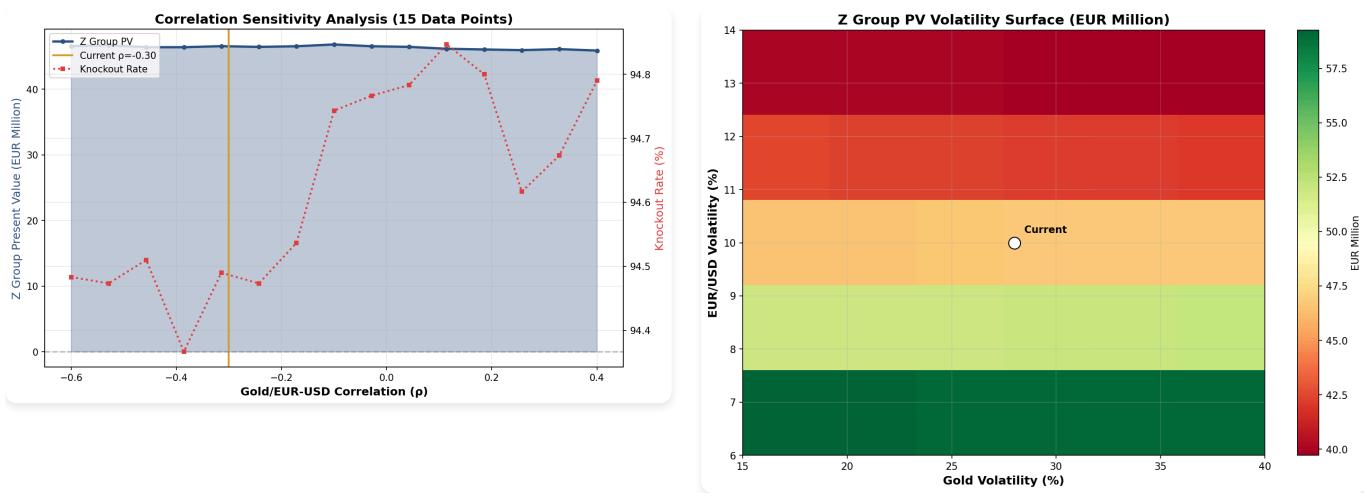


Gold Price Sensitivity Analysis (20 Data Points)



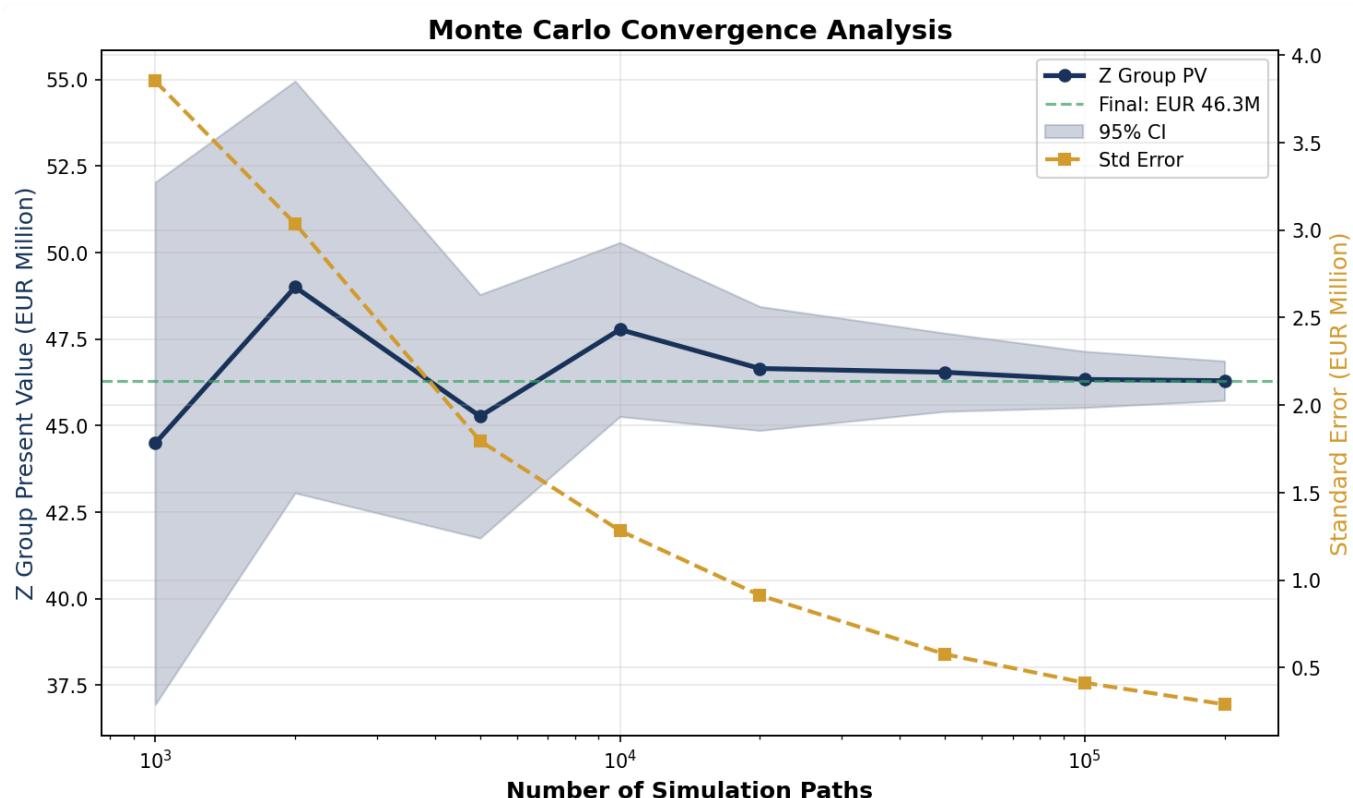
EUR/USD Sensitivity Analysis (20 Data Points)





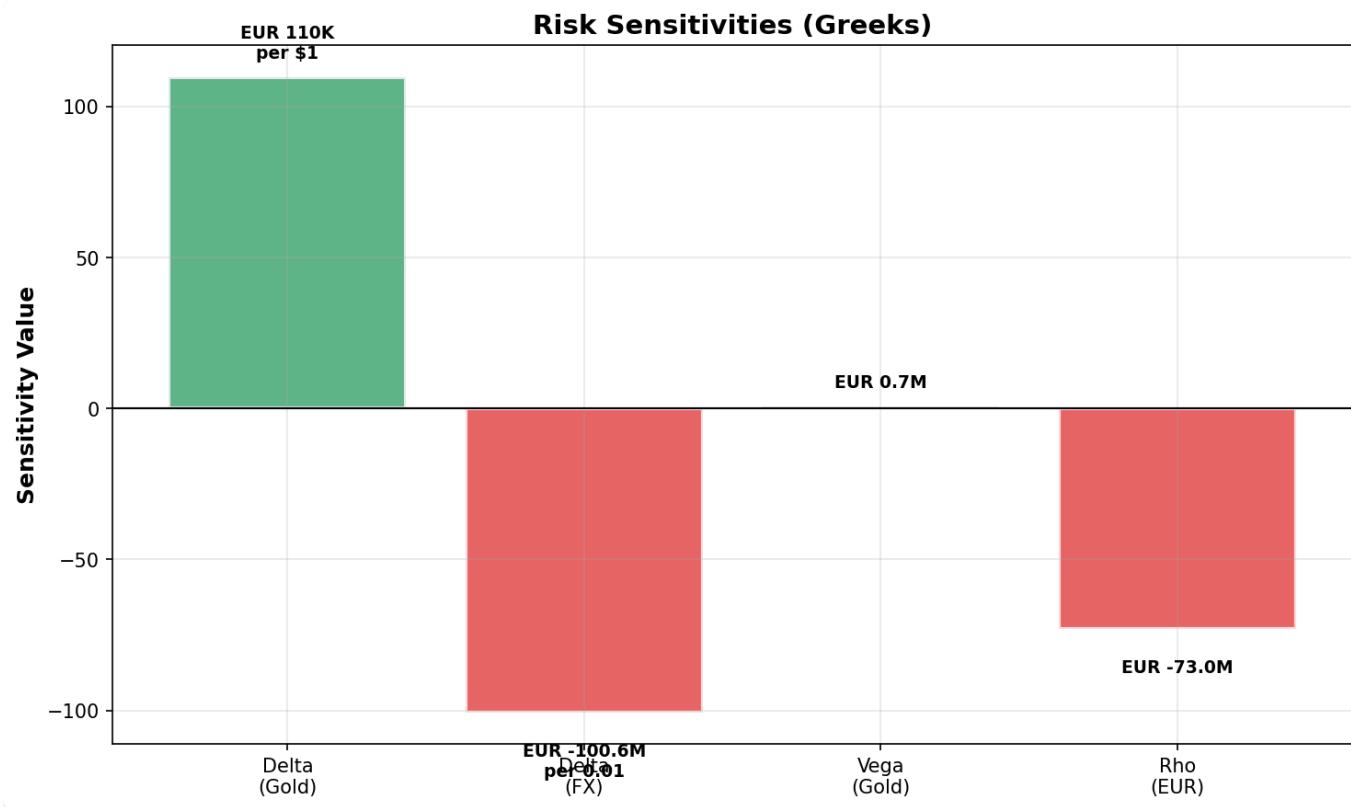
**Enhanced Analysis:** Sensitivity charts now include 20 data points for Gold and EUR/USD, 15 points for correlation, and a 2D volatility surface (6x5 grid). This provides comprehensive coverage of the parameter space.

## 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 ±EUR 3.85M at 1,000 paths to ±EUR 0.29M at 200,000 paths.

## 7. Risk Sensitivities (Greeks)



**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.

---

**GAAIF Challenge 2026** - Structured Gold Forward Pricing Analysis  
Monte Carlo Simulation: 100,000 paths | Market Data: February 1, 2026