

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 between Zeus Gold Group (Z Group) and Alphabank (A Bank) has experienced a **dramatic valuation reversal** due to significant market movements. Gold prices have surged to approximately \$4,900/oz while EUR/USD has strengthened to 1.19, fundamentally changing the product economics.

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.



Current Market Conditions

GOLD SPOT PRICE

\$4,900/oz

+78% from original analysis

EUR/USD RATE

1.19

Near 4-year high

GOLD VOLATILITY

28%

Elevated (7%+ crash last week)

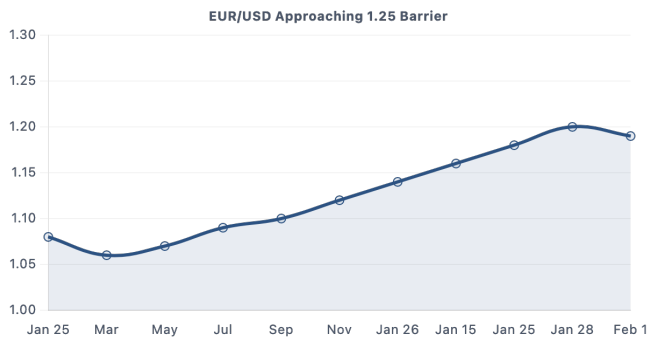
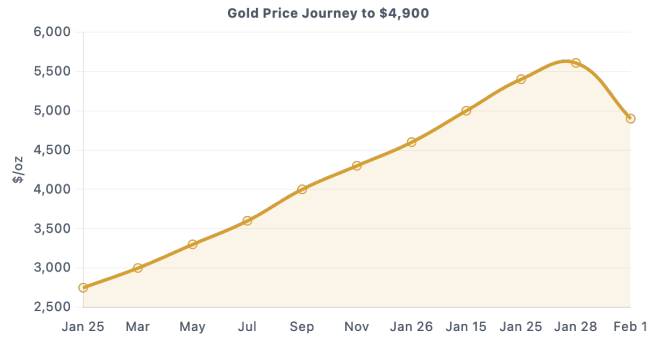
CORRELATION

-0.30

Gold/EUR-USD

Market Context

Gold reached a record high of **\$5,608/oz** on January 28, 2026, before experiencing a sharp 7%+ correction. The pullback was driven by profit-taking and dollar stabilization, but prices remain historically elevated around the \$5,000 psychological level. Meanwhile, EUR/USD has strengthened significantly on dollar weakness, approaching levels not seen since 2021.



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 (EUR):

$$\text{Payoff}_Z = N \times \frac{P - K}{K}$$

A Bank Payoff (EUR):

$$\text{Payoff}_A = N \times \frac{K - P}{K}$$

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

Current Intrinsic Value

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

Barrier Proximity Analysis

Lower Barrier (1.05)

1.05

Current: 1.19

Upper Barrier (1.25)

1.25

Distance to lower: 11.8% | Distance to upper: 5.0%



Pricing Model Framework

Two-Factor Correlated GBM Model

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

Gold Price Dynamics:

$$\frac{dS}{S} = (r_{USD} - q) dt + \sigma_S dW^S$$

where q = gold convenience yield

EUR/USD Dynamics:

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

Interest rate differential drives FX drift

Correlation Structure:

$$dW^S \cdot dW^X = \rho dt$$

Implemented via Cholesky decomposition: $W^X = \rho W^S + \sqrt{(1-\rho^2)}Z$

Model Parameters

| Parameter | Symbol | Value | Source/Rationale |
|------------------------|------------|------------|--|
| Gold Spot | S_0 | \$4,900/oz | LBMA, Feb 1, 2026 |
| EUR/USD Spot | X_0 | 1.19 | ECB Reference Rate |
| 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 due to recent 7%+ move |
| EUR/USD Volatility | σ_X | 10% | 1Y implied volatility |
| Correlation | ρ | -0.30 | Historical estimate (negative in crisis) |
| Gold Convenience Yield | q | 0.3% | Gold lease rate |



Monte Carlo Simulation Results

Z GROUP PRESENT VALUE

EUR +46.3M

95% CI: [45.5M, 47.1M]

A BANK PRESENT VALUE

EUR -46.3M

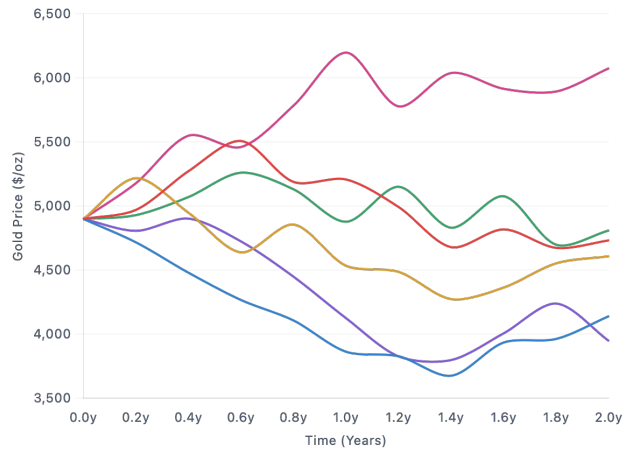
Mirror position

SIMULATION PATHS

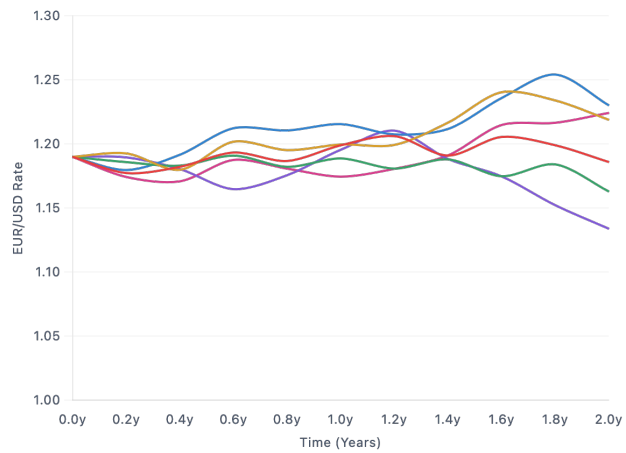
100,000

504 time steps

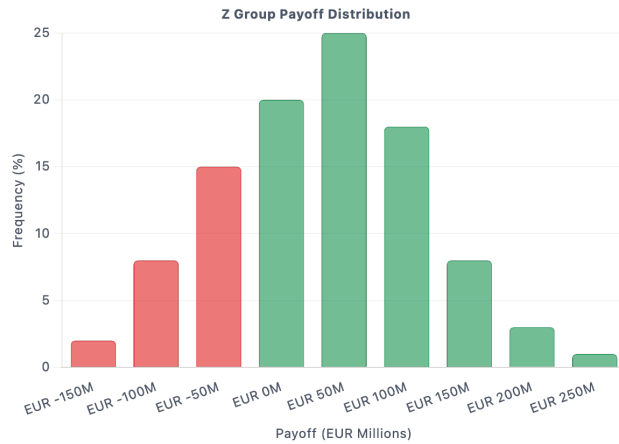
Sample Monte Carlo Paths - Gold



Sample Monte Carlo Paths - EUR/USD



Payoff Distribution



Knockout Analysis

KNOCKOUT RATE

94.8%

AVG KO TIME

0.61 yrs

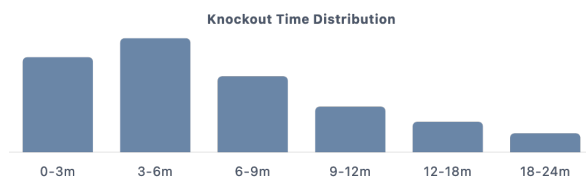
Barrier Breach Distribution

Upper Barrier (1.25)

59.9%

Lower Barrier (1.05)

34.8%



Valuation Change Analysis

Previous Assessment

Gold: \$2,750 | EUR/USD: 1.08

Z GROUP PV

EUR -192M

A BANK PV

EUR +192M

Lower barrier breaches: 85.7%

Current Assessment

Gold: \$4,900 | EUR/USD: 1.19

Z GROUP PV

EUR +46M

A BANK PV

EUR -46M

Upper barrier breaches: 59.9%



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

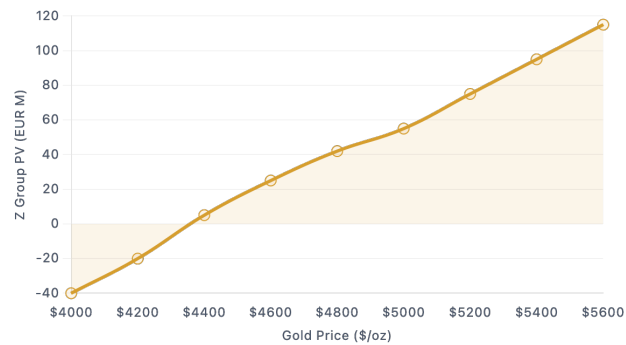


Scenario Analysis

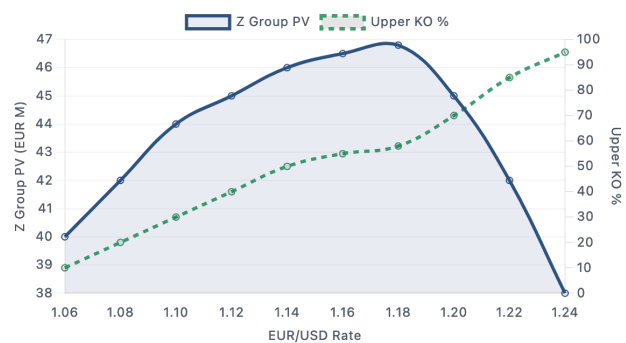
Impact of Market Movements on Z Group PV



Gold Price Sensitivity



EUR/USD Sensitivity



Volatility Impact Analysis

| Gold Vol | EUR/USD Vol | Z Group PV (EUR) | Knockout Rate | Upper KO | Lower KO |
|----------|-------------|------------------|---------------|----------|----------|
| 20% | 8% | EUR 52.7M | 83.4% | 51.9% | 31.5% |
| 25% | 9% | EUR 49.7M | 89.7% | 56.0% | 33.7% |
| 28% | 10% | EUR 47.3M | 93.8% | 59.0% | 34.8% |
| 32% | 11% | EUR 45.1M | 96.5% | 61.2% | 35.3% |
| 35% | 12% | EUR 43.4M | 98.0% | 62.7% | 35.4% |
| 40% | 14% | EUR 40.1M | 99.5% | 64.4% | 35.1% |

Key Insight: Higher volatility increases knockout probability, which generally reduces Z Group PV as settlements occur earlier when gold may not have appreciated as much.

Δ Risk Sensitivities (Greeks)

DELTA (GOLD)

EUR 110K

per \$1 gold move

DELTA (EUR/USD)

EUR -101M

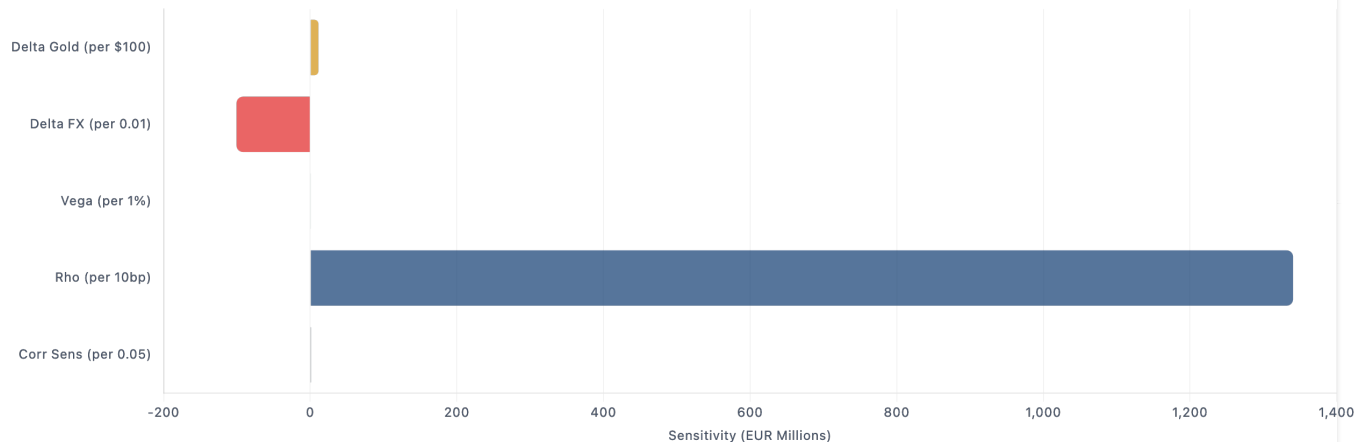
per 0.01 FX move

VEGA (GOLD VOL)

EUR 698K

per 1% vol change


Greeks Interpretation




Risk Factor Analysis

| Greek | Value | Interpretation |
|--------------|------------------|--------------------------------------|
| Delta (Gold) | EUR 109,827/\$1 | \$100 gold move = ~EUR 11M PV change |
| Gamma (Gold) | EUR 172.50 | Convexity exposure to gold |
| Delta (FX) | EUR -100.6M/0.01 | Extremely sensitive to EUR/USD moves |
| Vega | EUR 697,911/1% | Higher vol = more knockouts |
| Rho (EUR) | EUR 134M/1bp | Sensitive to EUR rate changes |
| Correlation | EUR 1.2M/0.05 | Modest correlation sensitivity |

Key Risk Observations

 **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.

 **Path Dependency:** Due to the knockout feature, the product exhibits strong path dependency. Greeks provide only local sensitivities and may change rapidly.

 **Hedging Consideration:** A Bank would need approximately 110K oz of gold exposure and significant EUR/USD hedges to delta-neutral this position.

Conclusions & Recommendations

Z Group Perspective

- ✓ Product has become a **EUR 46M asset** from a 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 combined with EUR weakness could still result in losses

A Bank Perspective

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

Final Assessment

The structured gold forward contract has experienced a **fundamental shift** in economics due to the unprecedented gold price rally and EUR/USD strengthening. The contract tenor extends to February 2028, but with a **~95% knockout probability** and average knockout time of **0.61 years**, early termination is highly likely.

The key risk factor going forward is the **EUR/USD barrier proximity**. At 1.19, the exchange rate is only 5% below the 1.25 upper knockout level. Any continuation of EUR strength would trigger termination and crystallize Z Group's gains at current gold levels.

GAAIF Challenge 2026 - Structured Gold Forward Pricing Analysis
Analysis performed using Monte Carlo simulation with 100,000 paths
Market data as of February 1, 2026