Funding a US acquisition

Fjord Instruments, a fictional euro-based buyer, signs a USD 100m purchase agreement on 1 January 2027. A USD 60m loan draws directly into escrow on 1 July. The buyer needs euros for the remaining USD 40m. The financing commitment and acquisition timetable determine how much FX to hedge.

Exposure	Decision at execution	Risk if assumptions change
USD 40m payment	Buy USD forward or buy a European USD call.	A delayed or cancelled deal leaves the original hedge outstanding.
USD 60m debt	After closing, retain the floating coupon, pay fixed on a swap, or buy a 5% cap.	Refinancing removes the loan while the derivative retains its value.
Dealer obligations	Offset FX, rate and option trades in the market.	Different indices, credit terms and settlement times create residual exposure.

Trade sequence

At signing, confirm the debt currency, draw conditions and residual USD requirement. Markets records the EUR-per-USD quote and European exercise date. At the three-month review, revalue outstanding trades. At closing, settle the FX hedge, draw the loan and choose the debt hedge. Fix each six-month coupon at the start of its period and pay at the end. Repay the USD 60m bullet with the final coupon.

Illustrative team responsibilities

Team	Decision or challenge
Investment Banking	Tests acquisition affordability, timing, financing certainty and debt structure with the client.
Markets	Translates exposure into terms, quotes the client, confirms execution and rebalances hedges.
Treasury	Checks currencies and timing of funding, collateral calls, liquidity buffers and settlement lines.
Risk	Independently challenges curves, volatility, fixing status, stress losses, exposure and limits.

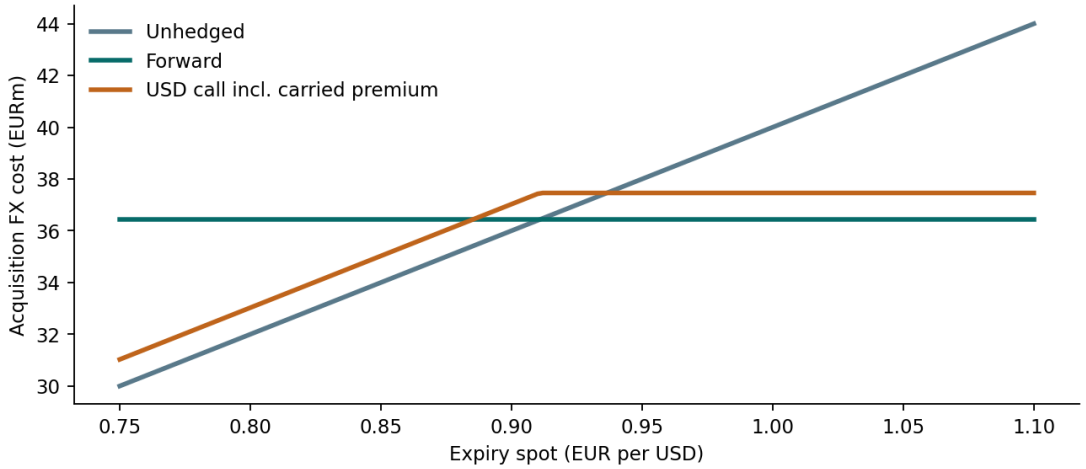
Model all amounts at fair value. For a quote illustration only, add EUR 0.020m to the call premium. The difference is gross quoted markup. Hedge execution, funding, credit, capital and operating costs would be needed to estimate profit. All exhibits below exclude the markup.

What the buyer pays in euros

Spot is 0.92 EUR per USD. A higher number makes the target more expensive. With EUR and USD continuous zero rates of 2% and 4%, the six-month forward is 0.910846, or -91.54 points. Buying USD now and financing the purchase gives the same locked price. An at-forward-strike call costs EUR 1.017m today, equivalent to EUR 1.028m at close.

Expiry spot	Spot purchase	Forward cost	Call cost[1]	Cancel forward[2]	Cancel call[12]
0.82	32.800	36.434	33.828	3.634	1.028
0.92	36.800	36.434	37.461	-0.366	0.661
1.02	40.800	36.434	37.461	-4.366	-3.339

EUR millions. [1] Includes premium grown at the EUR funding rate. [2] No acquisition payment. Positive means a cost and negative means cash benefit. Cash settlement plus buying USD at spot gives the same net cost as physical delivery at the locked price.



When the date moves

At month three, spot 0.88 gives the client forward MTM of EUR -1.402m and call MTM of EUR 0.218m. These are replacement values before settlement. An agreed unwind realizes them, with the call premium already paid.

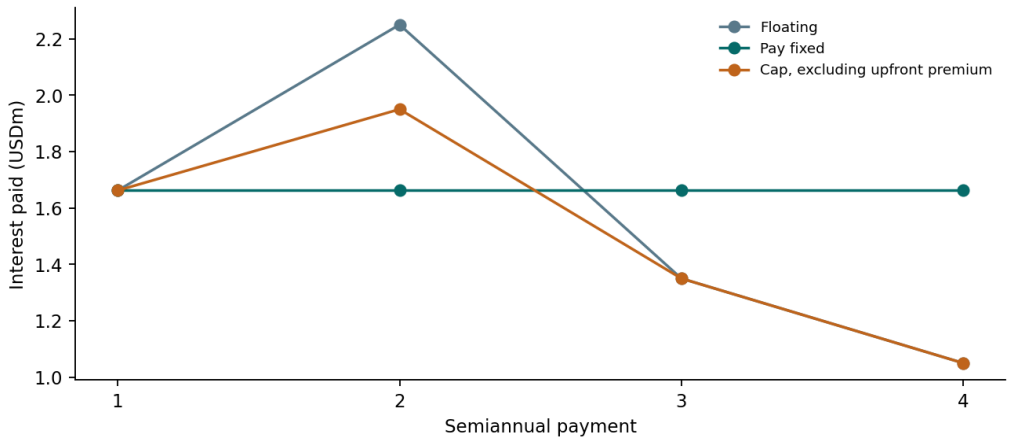
If closing slips three months and spot at the old expiry is 0.82, the forward costs EUR 3.634m to settle. The call expires worthless. A fresh three-month forward costs zero upfront and locks 0.815910. Including financing of earlier cash, month-nine acquisition costs are EUR 36.288m after the old forward or EUR 33.669m after the old call. The replacement forward creates a new obligation.

How much each coupon costs

The loan pays a synthetic six-month USD reset plus 150 bp. The swap receives that same reset and pays 4.0403% fixed. The client still owes the loan spread, giving 5.5403% all-in. The cap pays the amount above 5% and costs USD 0.155m at inception. The first fixing is known when the hedge starts.

Payment	Reset	Loan	Swap receipt	Net fixed	Cap receipt	Net capped
1	4.04%	1.662	-0.000	1.662	0.000	1.662
2	6.00%	2.250	0.588	1.662	0.300	1.950
3	3.00%	1.350	-0.312	1.662	0.000	1.350
4	2.00%	1.050	-0.612	1.662	0.000	1.050

USD millions. Pay dates are 1 Jan 2028, 1 Jul 2028, 1 Jan 2029 and 1 Jul 2029. Total nominal interest is USD 6.312m floating, 6.648m swapped, or 6.167m capped including premium. This is a realized teaching path, not an expected-cost ranking. Principal is common to all three choices.



Refinancing one year early

Immediately after coupon two, assume the two remaining resets project at 3% and the continuous discount rate is 3%. The first remaining reset is known. The swap MTM is USD -0.610m to the client. Paying this amount in absolute value closes the swap. The remaining cap can be sold for USD 632 before costs. The loan principal and any contractual prepayment fee settle separately.

Reading the dealer book

A single acquisition moves through two stages. For a simultaneous desk snapshot, use two independent clients with identical funding terms. Client A is signing, with USD 20m each in a forward and a call. Client B has already closed, with USD 30m each in a swap and a cap. This prevents counting the same full exposure twice. The full-size client alternatives on earlier pages remain comparable.

Bank trade	Market offset at 95% of size	Residual
Sell USD forward	Buy USD forward for the same maturity.	Short USD delta.
Write USD call	Buy a matching USD call. A desk could delta hedge and source vega separately.	Short gamma and vega on the uncovered portion.
Receive fixed, pay reset	Pay fixed, receive reset on a market swap.	Rate curve and hedge-index basis.
Sell cap	Buy same strike and caplet dates.	Unmatched volatility, fixing and index exposure.

Signed local sensitivity	Unhedged EUR	95% hedged EUR
FX delta	-296,824	-14,841
USD DV01	-3,681	-184
FX vega	-50,846	-2,542
Cap vega	-5,124	-256
FX gamma P&L for 0.01 squared	-6,007	-300

FX delta is the linear P&L; for +0.01 EUR/USD (EUR per USD here). DV01 is signed P&L; for +1 bp in the USD discount and projection curves, including FX carry. Each vega refers to +1 absolute volatility point. Gamma is half the second derivative times 0.01 squared. The first rate fixing stays locked. Cash premiums remain in their original currencies. Central differences and full revaluation use identical base positions.

Credit and funding conventions

OTC clients post no collateral. Enforceable netting is assumed within each separate client, with no cross-client offset. Positive MTM is the sum of positive net replacement values, excluding received premiums. Market hedges share one EUR-equivalent daily variation margin (VM) account. The model assumes immediate collateral on the change in hedge value, no initial margin and no collateral on the opening premium. Peak funding is incremental to opening balances, before client cash arrives.

What survives the hedge

Instant shock	Unhedged	Net	Peak VM	Exposure	Loss proxy
Base	0.000	0.000	0.000	0.000	0.000
USD +10%	-3.153	-0.158	0.000	0.000	0.000
USD -10%	2.276	0.114	2.162	1.767	0.011
USD curve +100bp	-0.423	-0.021	0.000	0.000	0.000
USD curve -100bp	0.325	0.016	0.309	0.392	0.002
Twist front -50 / back +50bp	-0.165	-0.008	0.000	0.000	0.000
FX / cap vol +3 / +5pt	-0.179	-0.009	0.000	0.000	0.000
Hedge index +25bp	0.000	0.121	0.000	0.000	0.000
Cancel before close / USD -10%	2.276	0.114	2.162	1.767	0.011
Credit weakens / USD -10%	2.276	0.114	2.162	1.767	0.106
Matched hedge / USD -10%	2.276	0.000	2.276	1.767	0.011

EUR millions. All parallel USD shifts affect discounting and projection. The twist uses a front discount shift of -50 bp and projected continuous rates sloping from -50 to +50 bp relative to base. Basis affects only unfixed market-hedge forwards. The credit proxy is current positive exposure times assumed one-year default probability times 60% loss given default. It is a static diagnostic, separate from market P&L.;

Three moments in a matched forward

At execution the USD 20m forward and its exact hedge both have zero value. Immediately after USD falls 10%, the dealer has a EUR 1.804m client receivable and an equal market loss. At the VM deadline it posts EUR 1.804m cash. If the client agrees to close out at that mark and pays the next day, the receipt covers the bridge. Rates and spot are held fixed between deadlines. The combined matched-book scenario above includes the option too.

Cancellation occurs with the same FX shock as the ordinary down scenario. The agreement survives the failed deal. Before settlement the MTMs and credit exposure are identical. On full FX closeout and collection, the dealer receives the client A net replacement value, closes its market FX hedge and releases the related credit exposure. Client B continues independently. Slippage, recovery delays and physical settlement funding can increase cash needs.

Verification and boundaries

The Python identities test funding, carry, par swap, every coupon, expiry cost, shock aggregation and the matched hedge. Nineteen supplemental checks cover direction, model dates, implied volatility, product cash flows and credit stress. An 800-step tree checks the FX option within EUR 600. The exported workbook formula caches are compared with Python for 144 cells. Charts and report exhibits consume the same numerical arrays. No native Excel session, live data feed, legal netting opinion or historical calibration was used. Deterministic stress paths support these decisions without an estimated VaR or Expected Shortfall.

Client advisory memo

To the CFO of Fjord Instruments

Secure the USD 60m draw so it is available at closing. While timing and approvals remain uncertain, buy the six-month USD call on the remaining USD 40m. The fair premium of EUR 1.017m buys the right to walk away and preserves savings from a weaker dollar. Budget EUR 37.461m for this FX component at expiry including premium carry. If the deal is cancelled, the premium is at risk and an in-the-money option can still be monetized.

If the amount and date become firm and upfront liquidity is scarce, the forward locks EUR 36.434m at zero fair upfront cost. Confirm the roll budget and authority to unwind. Once debt draws, use the cap if refinancing flexibility matters and USD 0.155m is available for premium. It limits each annualized all-in coupon rate to 6.50% while the spread stays fixed. For debt expected to remain outstanding, the swap instead provides a predictable 5.54% all-in rate. Confirm how future USD debt service will be funded from USD earnings or future FX purchases.

Bank risk memo

To the Markets risk manager and Treasury

Offset the client directions with long USD forwards and calls, a pay-fixed swap and purchased caplets. Match currency, strike, maturity, fixing and collateral terms. At 95% coverage a 10% USD rise costs EUR 0.158m net. The matched down shock still requires EUR 2.276m of incremental collateral. Treasury should test available EUR cash and intraday credit against this call before adding positions.

Review signed FX delta, gamma, both vegas, bucketed rate exposure, hedge-index spreads, positive MTM by netting set, counterparty limits and the VM payment calendar. Escalate a failed financing draw, expiry mismatch, downgrade or collateral call above available liquidity. Reprice on independent curves and executable volatility quotes before a real trade. A quoted spread earns revenue only to the extent execution and lifecycle costs permit.