Practitioner Paper

Designing FX Overlays That Behave

A practical framework for managing carry, path dependency, and long-horizon FX risk

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By Mike Duncan, Para Bellum Advisors

www.parabellumadvisors.com

1. Executive Summary

FX hedging is routinely treated as a single problem with a single solution. It isn't.

Most portfolios combine indefinite FX exposures with finite hedging instruments, then rely on rolling short-dated forwards to bridge the gap. Operationally, this works. Economically, it often fails.

This paper reframes FX hedging as three distinct problems, not one:

1. **Locking outcomes** for genuinely long-dated, stable exposures
2. **Managing volatility** for indefinite, evolving positions
3. **Controlling tail risk** when path dependency creates catastrophic outcomes

Each requires a different structure. Most portfolios use one structure for everything.

The result is predictable: FX risk that is shaped in the short term but uncontrolled over time, carry costs that quietly compound, and path dependency that surfaces only after years of underperformance.

The three-layer framework presented here matches hedge structure to exposure characteristics. It won't improve returns in smooth markets. It prevents catastrophic underperformance when FX paths turn volatile – precisely when portfolios are most vulnerable.

All numerical examples are illustrative but reflect realistic market conditions observed over the past decade.

The objective is not to eliminate FX risk. It is to match the hedge to the nature of the exposure.

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2. FX Hedging Is Not One Problem

FX exposure is often discussed as if it were homogeneous. It isn't.

Some FX exposures are finite. Others are indefinite. Some terminate naturally. Others persist for as long as the portfolio exists. Treating them all the same is the root cause of most FX hedging failure.

The Core Distinction

Consider two positions:

Position A: A five-year USD-denominated corporate bond held by an Australian super fund. The bond matures on a known date. Principal and coupons are contractually defined. The FX exposure has a natural endpoint.

Position B: A strategic allocation to US equities with no defined exit date. The position will be rebalanced, assets will turn over, managers may change, but the offshore exposure persists indefinitely.

Both create FX risk. But they are fundamentally different problems.

Position A can be hedged to a known terminus. A five-year cross-currency swap matches the exposure precisely. There is no structural mismatch.

Position B cannot. Any fixed-tenor hedge creates a decision point: what happens when it expires? If the exposure continues but the hedge doesn't, FX risk resurfaces. If the hedge is rolled, you're back to managing path dependency.

Yet in practice, both are often hedged using the same structure: rolling short-dated FX forwards.

This is convenient. It is also structurally incoherent.

Why the Distinction Matters

FX risk is path dependent. What matters is not just where the currency ends up, but how it gets there.

- Short-dated hedges reset that path repeatedly
- Long-dated hedges fix it
- Options reshape it

If you don't distinguish between these objectives, you end up optimising for the wrong thing – usually liquidity and optics rather than economics.

The Exposure Classification Framework

Before selecting any instrument, classify the exposure:

Exposure Type	Characteristics	Natural Hedge Structure
Finite, Certain	Known maturity, fixed cashflows, stable size	Tenor-matched CCS or long-dated forwards
Finite, Uncertain	Probable but not certain exit date	Rolling forwards with option overlay
Indefinite, Stable	Perpetual exposure, strategic allocation	Rolling forwards, potentially with options for path management
Indefinite, Volatile	Active trading, frequent rebalancing	Short-dated rolling forwards only

The first step in any FX hedging programme is not instrument selection.
It is exposure classification.

Get this wrong, and everything downstream fails.

3. Why Rolling FX Forwards Dominate

Despite years of criticism, rolling short-dated FX forwards remain the default hedging tool for institutional portfolios. This is not accidental, nor is it evidence of collective incompetence.

Rolling forwards dominate because they optimise for **operational survival**.

They offer:

- Deep liquidity in most currency pairs
- Tight bid-offer spreads at 1–3 month tenors
- Simple hedge accounting treatment
- Minimal termination risk
- Easy resizing as portfolios evolve
- Familiar documentation and operational processes

From a governance perspective, they are hard to argue against. They are familiar. They are auditable. They fit neatly into committee-driven risk frameworks. They don't require multi-year commitments that might outlive the CIO who approved them.

3.1 When Rolling Forwards Are Optimal

For portfolios with:

- Uncertain holding periods
- Active rebalancing
- Manager turnover
- Evolving mandates
- Governance structures that cannot tolerate mark-to-market volatility

Rolling forwards are robust.

That robustness, however, is often mistaken for optimality.

3.2 The Governance Trap

Rolling forwards survive because they make bad outcomes less visible:

- Carry drag accumulates slowly
- Path dependency only surfaces after years
- Each individual roll looks sensible
- Accountability is diffused across time

A long-dated hedge that loses money is immediately visible. Forty rolling hedges that collectively underperform are not. This creates an institutional bias toward short-dated structures that persists regardless of economic merit.

Rolling forwards are excellent at reducing short-term FX volatility. They are poor at delivering long-term FX certainty. Conflating the two is where problems begin.

Rolling forwards survive because they are resilient.
Not because they solve the right problem.

4. What Rolling Forwards Actually Do

To evaluate FX hedging properly, we need to be precise about what rolling forwards deliver – and what they don't.

4.1 What They Do

Rolling short-dated FX forwards:

Do:

- Reduce short-term FX volatility
- Smooth periodic reporting outcomes
- Limit drawdown amplification during acute FX shocks
- Provide flexibility to adjust hedge ratios as exposures change
- Avoid large upfront commitment to long-dated structures

Do not:

- Neutralise long-term FX risk
- Lock in base-currency returns
- Remove path dependency
- Control cumulative carry drag
- Guarantee outcomes over multi-year horizons

Each roll resets the hedge at prevailing spot and forward points. Over time, this introduces compounding uncertainty, not certainty.

4.2 A Worked Example: The Compounding Effect

Consider an Australian super fund with a persistent USD 100 million equity exposure, hedged using rolling 3-month FX forwards over 10 years.

Assumptions:

- AUD/USD spot starts at 0.6500
- Interest rate differential averages 2.5% p.a. (USD rates higher)
- The fund rolls the hedge 40 times over the decade
- Each roll incurs 5 basis points in transaction costs

What happens:

Year 1: Forward points cost 250 bps. Transaction costs: 20 bps. Total drag: 270 bps on the hedged exposure.

Over 10 years:

- Cumulative carry cost: approximately 27% of the exposure
- Cumulative transaction costs: 200 bps
- Total economic cost: ~29% before any FX movement

Meanwhile, the unhedged exposure experiences whatever FX volatility occurs, but pays no systematic drag.

Now compare to a 10-year cross-currency swap executed at inception:

- Carry cost: embedded in the fixed swap spread, approximately 25-28% over the period
- Transaction costs: executed once, ~15-20 bps
- Mark-to-market volatility: high, but economically irrelevant if held to maturity

The CCS looks more expensive on day one. Over the full horizon, it's structurally cheaper – but only if the exposure persists.

This is why the "rolling forwards are cheaper" narrative survives. The comparison is always point-in-time, never lifecycle.

4.3 Path Dependency in Practice

Path dependency means your outcome depends on the route taken, not just the destination.

Scenario: USD appreciates 20% over 10 years in a straight line versus USD appreciates 20% but with a 30% spike in year 5 before settling.

With rolling forwards:

- In the linear case, you reset at moderately unfavourable rates throughout
- In the volatile case, you reset at extremely unfavourable rates during the spike, locking in losses, then reset again at better rates later – but the damage is done

With a long-dated hedge:

- Path doesn't matter. The rate is fixed from day one.

Rolling forwards remove your ability to ignore the path. If you have strong views on long-run FX but no view on the path, rolling forwards systematically work against you.

4.4 Case Study: Quarterly Volatility Reduction vs Long-Term Divergence

Portfolio: AUD 500 million balanced fund with 30% offshore equities, 50% hedge ratio

Short-term outcome (Year 1):

- Quarterly FX volatility: 8.2% unhedged → 4.1% hedged
- Reporting outcomes smoothed
- Governance satisfied

Long-term outcome (10 years):

- Cumulative carry drag: -18% on hedged portion
- Unhedged portion: +5% from FX appreciation
- Net result: hedged portfolio underperforms by 11.5% versus unhedged, despite identical asset returns

The hedge "worked" every quarter. The outcome still disappointed.

If the mandate is to stabilise quarterly returns and prevent extreme drawdowns, rolling forwards do exactly what they are meant to do.

If the mandate is to deliver currency-neutral returns over multi-year horizons, they don't – and never will.

Rolling forwards shape volatility.
They do not eliminate FX exposure.

5. Hedge Ratios and the Myth of Neutrality

There is no universally "correct" FX hedge ratio.

The Reality of Institutional Practice

Observed institutional hedge ratios vary significantly by jurisdiction and mandate:

- **0–30%** for growth-oriented portfolios with long horizons
- **30–60%** for balanced mandates seeking moderate volatility reduction
- **60–80%** for liability-aware investors matching near-term cashflows
- **80–100%** common under mandatory hedging regimes (Australian MySuper, some European pension funds)

These ranges reflect global diversity, not best practice for any specific regime. Australian super funds, for example, cluster at 70-100% due to MySuper requirements and governance conservatism. European pension funds vary dramatically by country. Singaporean insurers face capital treatment incentives that push toward higher ratios.

The Fundamental Asymmetry

Here is the core problem that most hedge ratio discussions ignore:

- Expected long-run FX return ≈ 0 (after adjusting for carry)
- Expected hedge cost ≠ 0

This asymmetry is not a market inefficiency. It is structural.

Currency markets exhibit no persistent directional edge over very long horizons. Spot rates tend toward purchasing power parity, though deviations can persist for decades. Uncovered interest parity fails empirically—the carry trade exists precisely because high-interest currencies don't depreciate as much as forward points predict—but these deviations are volatile and unreliable.

Over sufficiently long periods (20+ years), the expected FX return of an unhedged position approximates zero. But hedge costs accumulate continuously and predictably.

But FX hedges are not free. They crystallise:

- Interest rate differentials (carry)
- Bid-offer spreads
- Roll costs
- Funding costs in stressed markets

These costs are real, systematic, and one-directional.

What this means in practice:

A portfolio can be "fully hedged" and still experience significant FX-driven underperformance relative to expectations. When this happens, the hedge is blamed for "not working", even though it did exactly what it was designed to do.

The hedge eliminated FX volatility. It also eliminated the possibility of FX gains that might have offset carry drag. You got what you paid for.

Why 100% Hedge Ratios Persist

Full hedging survives because:

1. **Governance simplicity**: "We hedge all FX risk" is easier to explain than "We hedge 60% after considering carry, volatility, and time horizon"
2. **Accountability avoidance**: If the hedge ratio is 100%, FX outcomes can't be blamed on the CIO's discretion
3. **Regulatory pressure**: Some regimes effectively mandate high hedge ratios

4. **Misunderstanding of "neutral"**: Many stakeholders believe 100% hedged = 0% FX impact, which is wrong

The mistake was upstream: conflating "hedged" with "neutral".

Optimal Hedge Ratios Are Context-Dependent

The appropriate hedge ratio depends on:

- Time horizon (longer = lower optimal ratio due to carry drag)
- Liability structure (short liabilities = higher ratio needed)
- Governance tolerance for FX volatility
- Carry environment (large negative carry = lower ratio justified)
- Base currency (matters enormously – see the section Carry is the Dominant Driver))

There is no single answer. But there are wrong answers, and they usually involve ignoring carry entirely.

6. Carry Is the Dominant Driver

Most FX hedging discussions fixate on volatility. This is the wrong variable.

Over long horizons, **carry dominates outcomes**.

6.1 Why Carry Matters More Than Volatility

Currencies do not offer persistent directional returns. Interest rate differentials do. Forward points compound relentlessly, whether anyone is paying attention.

Volatility is episodic. Carry is systematic.

A 3% interest rate differential costs you 3% per year, every year, regardless of whether spot moves or not. Over 10 years, that's 30% of your exposure – more in compounding terms.

The Base Currency Effect

The same hedging strategy produces radically different outcomes depending on your base currency.

Example: Australian super fund versus Japanese pension fund, both hedging USD equity exposure

Australian fund (AUD base):

- USD rates typically higher than AUD rates
- Forward points favour USD (discount to spot)
- Hedging costs money every roll
- 10-year cumulative drag: -20% to -30%

Japanese fund (JPY base):

- USD rates significantly higher than JPY rates
- Forward points heavily favour USD
- Hedging earns positive carry
- 10-year cumulative gain: +15% to +25%

Same exposure. Same hedge structure. Opposite economic outcome.

For low-rate base currencies, FX hedging is structurally expensive.
For high-rate base currencies, it can be accretive.

This is why you cannot import hedge ratios or hedging strategies from overseas peers without adjusting for your base currency environment.

Quantifying the Effect

Scenario 1: AUD investor hedging USD exposure

- Spot: AUD/USD 0.6500
- USD 3-month rate: 5.5%
- AUD 3-month rate: 4.0%
- Forward points (annualised): -1.5%

Over 10 years at current differential:

- Year 1 carry cost: 1.5% of exposure
- Compounding over 10 years: approximately 16% cumulative drag
- Add transaction costs (5 bps per roll × 40 rolls): another 2%
- Total structural cost: ~18%

Scenario 2: JPY investor hedging USD exposure

- USD 3-month rate: 5.5%
- JPY 3-month rate: 0.25%
- Forward points (annualised): +5.25%

Over 10 years:

- Year 1 carry gain: 5.25%
- Compounding over 10 years: approximately 65% cumulative gain
- Transaction costs: -2%
- Net structural benefit: ~63%

The same USD equity portfolio, hedged identically, delivers an 81-percentage point difference in outcome purely from carry.

When Carry Works in Your Favour

Hedging can be economically attractive when:

- Your base currency has structurally lower rates than the exposure currency
- The rate differential is wide and persistent

- The exposure is genuinely long-term

In these cases, the hedge doesn't just reduce risk – it adds return.

When Carry Works Against You

Hedging becomes economically painful when:

- Your base currency has higher rates (paying carry to hedge)
- The exposure is long-dated and stable (carry drag compounds)
- Governance forces high hedge ratios regardless of cost

Why Carry Is Ignored

Carry is invisible in conventional risk reporting:

- VaR models focus on volatility, not systematic drift
- Performance attribution isolates spot moves but buries forward points in "other"
- Hedge accounting treats carry as an offset, not a cost
- Governance committees see quarterly hedge P&L, not cumulative lifecycle economics

If carry is not discussed explicitly in governance forums, it is still being paid – quietly and indefinitely.

Ignoring carry does not make it disappear.
It just makes the outcome surprising later.

7. Tenor Matching – When It Works, When It Fails

Tenor matching is conceptually appealing. Hedge the exposure for as long as it exists. Simple.

It works extremely well for instruments with defined cashflows and maturities. Bonds. Loans. Project finance. Anything with a contractual endpoint.

It fails when applied indiscriminately to exposures that do not terminate naturally.

7.1 When Tenor Matching Works Perfectly

Case study: Insurance company holding USD corporate bonds

- Portfolio: USD 200 million in investment-grade corporate bonds
- Average duration: 7 years
- Liability matching: USD cashflows needed to pay AUD claims in 5-8 years

Hedge structure:

- 7-year cross-currency swap, USD fixed to AUD fixed
- All future USD coupons and principal converted to AUD at known rates
- Perfect tenor match

Outcome:

- FX risk eliminated entirely for the life of the assets
- Carry locked in at inception
- No roll risk, no path dependency
- Mark-to-market movements economically irrelevant if held to maturity
- Operational simplicity: set and forget

This is tenor matching at its best. The exposure has a natural terminus. The hedge matches it. Job done.

7.2 When Tenor Matching Fails Badly

Case study: Pension fund hedging offshore equity allocation

- Portfolio: AUD 400 million strategic allocation to global equities
- Expected holding period: "long term" (undefined)
- Current policy: 70% hedge ratio

Initial hedge structure:

- 10-year FX forwards locked at 0.6800

Year 5 problem:

- New CIO appointed
- Strategic asset allocation review reduces global equities from 35% to 25%
- Need to reduce hedge by AUD 100 million equivalent

Crisis:

- Spot has moved to 0.7200 (AUD stronger)
- Hedge is deeply in-the-money
- Unwinding means crystallising large MTM gains – which triggers:
    - Tax consequences
    - Performance distortion
    - CSA implications with counterparty
    - Potential need to post collateral
- Alternatives are equally bad:
    - Keep the hedge and be over-hedged (governance breach)
    - Pay termination costs and destroy value
    - Enter offsetting trades (complexity, basis risk, ongoing cost)

The hedge did exactly what it was supposed to do. The problem was upstream: applying tenor matching to an exposure that wasn't fixed.

7.3 The Hidden Risks of Long-Dated Hedges

Long-dated hedges introduce:

1. Termination risk If your exposure changes – through manager decisions, mandate shifts, or asset sales – you're stuck with a hedge that no longer fits.

2. Mark-to-market volatility A 10-year FX hedge can swing 20-40% in value. Even if economically irrelevant (you're holding to maturity), this creates:

- Balance sheet noise
- Audit questions
- Board nervousness
- Pressure to "do something"

3. Credit and collateral consumption Long-dated hedges consume more credit lines and CSA capacity than rolling shorts. In stressed markets, counterparties may:

- Demand additional collateral
- Refuse to extend further hedges
- Force early termination

4. Illiquidity outside core pairs Rolling 3-month EUR/AUD forwards: liquid, tight spreads
10-year EUR/AUD forwards: wide spreads, limited capacity, few counterparties

This is why many portfolios avoid long-dated FX hedges even when they appear theoretically sound. The real risk is not FX. It is being forced to unwind a hedge at the wrong time for the wrong reason.

7.4 The Decision Framework

If your exposure is...	Then tenor matching is...
Contractually defined with fixed maturity	Optimal
Strategically stable but no fixed exit	Risky unless governance can tolerate MTM and termination risk
Subject to active management	Wrong
Uncertain or evolving	Dangerous

Tenor matching is not wrong.
It is context dependent.

8. FX Forwards vs Cross-Currency Swaps

This is where most discussions collapse into caricature.

Cross-currency swaps are often described as "expensive", "complex", or "overkill". They are simply misapplied as often as they are underused.

8.1 What Cross-Currency Swaps Actually Do

A cross-currency swap converts a foreign-currency asset into a synthetic domestic-currency asset for the life of the swap.

It:

- Locks FX conversion at inception
- Fixes funding spread for the entire tenor
- Aligns hedge and asset cashflows (if structured correctly)
- Eliminates FX path dependency
- Removes the need for active hedge management

For genuinely long-dated, stable exposures, this is exactly what you want.

8.2 Why CCS Look Expensive

CCS appear expensive because they are compared to the wrong benchmark.

The trap:

You compare a 10-year CCS quote today against a 3-month FX forward quote today.

The CCS looks expensive.

But you aren't buying one 3-month hedge. You're buying forty of them.

The Real Cost Comparison

Structure A: 10-year cross-currency swap

- Executed today at inception
- All-in cost: locked for 10 years
- Transaction cost: 15-20 bps (once)
- Operational cost: minimal (set and forget)
- Carry: embedded in swap spread

Structure B: Rolling 3-month FX forwards for 10 years

- Executed quarterly, 40 times
- All-in cost: unknown (depends on forward points at each roll)
- Transaction cost: 5 bps × 40 = 200 bps cumulative
- Operational cost: ongoing (execution, confirmation, settlement, accounting)
- Carry: paid continuously, compounds over time
- Re-strike risk: exposed to unfavourable rates at each roll

Numerical example: AUD investor hedging USD 100m bond portfolio

10-year CCS:

- Swap spread to lock AUD funding: 50 bps p.a.
- Total cost over 10 years: 500 bps

- Transaction cost: 20 bps
- All-in: 520 bps over decade

Rolling 3-month forwards:

- Average carry (interest differential): 150 bps p.a.
- Total carry cost over 10 years: 1,500 bps
- Transaction costs: 200 bps
- Re-strike drag (conservatively): 100 bps
- All-in: 1,800 bps over decade

The CCS is one-third the cost.

But it looked more expensive on day one because all the costs were visible and upfront.

CCS concentrate cost upfront. Rolling forwards distribute it invisibly over time. When you annualise the full economics, CCS are often cheaper – not more expensive.

Important caveats:

The magnitude of CCS advantage depends on:

1. **Persistence of carry differential** - if USD/AUD rates converge, rolling forward costs decline
2. **Stability of CCS swap spreads** - during stress (e.g., March 2020), spreads can widen from 50bps to 100bps+, eroding the advantage
3. **Accuracy of forecasting holding period** - if you exit the CCS early, termination costs can eliminate all savings

In the example above, if rates converge to neutral (0% differential) after Year 3, rolling forwards become competitive. If CCS spreads widen to 100bps, the advantage shrinks by half.

The CCS comparison is directionally robust but not guaranteed. Run sensitivity analysis before committing to long-dated structures.

8.3 When CCS Are the Right Tool

Use cross-currency swaps when you have:

1. Stable, long-dated exposures

- Corporate bonds with known maturity
- Infrastructure project cashflows
- Strategic offshore property holdings
- Multi-year loan commitments

2. Clear intent to hold

- No expected portfolio turnover
- No manager discretion to exit early

- Governance commitment to the asset class

3. Meaningful size

- Minimum USD 50-100 million to justify documentation and pricing
- Smaller sizes incur proportionately wider spreads

4. Tolerance for mark-to-market noise

Accounting treatment that allows hedges to be held without daily P&L recognition

Governance understanding that MTM volatility ≠ economic loss if held to maturity

8.4 When CCS Are the Wrong Tool

Avoid cross-currency swaps when:

1. Holding period is uncertain

- Active equity allocation subject to SAA review
- Manager mandates that may change
- Assets that might be sold opportunistically

2. Exposure size is volatile

- Equities where market movements change notional
- Actively managed portfolios with high turnover

3. Governance cannot tolerate MTM volatility

- Board requires stable quarter-to-quarter hedge valuations
- Audit committee interprets mark-to-market losses as mistakes
- Performance measurement penalises hedge volatility

4. Currency pair is illiquid

- Exotic or emerging market currencies
- Pairs with limited long-dated market depth
- Counterparties unwilling to commit long tenor

The Documentation and Operational Reality

CCS require:

- ISDA Master Agreement with Credit Support Annex
- Collateral posting arrangements (typically two-way)
- CSA valuation and margin call processes
- Systems to handle swap cashflows and valuations
- Regular mark-to-market reporting

This is material operational overhead.

For a AUD 2 billion super fund hedging a stable USD bond portfolio, it's worthwhile.

For a AUD 200 million fund with volatile offshore exposure, it probably isn't.

CCS are not superior.
They are specific.

Collateral and Mark-to-Market Management

Cross-currency swaps introduce operational complexity that rolling forwards avoid: mark-to-market volatility and collateral posting requirements.

How it works:

Most CCS are traded under ISDA Credit Support Annexes (CSA) that require:

- Daily mark-to-market valuation
- Two-way collateral posting (both parties post when out-of-the-money)
- Margin calls triggered when MTM exceeds threshold (typically USD 1-5m)

For a USD 150m, 7-year CCS, typical MTM volatility:

- 5% FX move → ±USD 7.5m MTM swing
- 15% FX move (e.g., March 2020) → ±USD 22.5m MTM swing

The operational burden:

If AUD strengthens 15% (0.6500 → 0.7475):

- CCS is now USD 22.5m out-of-the-money for the AUD investor
- Counterparty issues margin call
- Fund must post USD 22.5m in cash or securities within 24-48 hours

When this happens:

Typically, during equity market stress (FX and equity risk are often correlated). You're forced to post collateral precisely when:

- Cash is tight (equity portfolios have fallen, redemptions may be elevated)
- Securities are expensive to liquidate (markets are volatile, bid-offer spreads are wide)
- Treasury teams are already managing other margin calls (futures, equity derivatives)

Why this matters:

Rolling forwards also have MTM risk, but:

- 3-month forwards have much lower DV01 (a 15% move creates 3-4% MTM, not 15%)
- Positions roll off quickly, limiting peak exposure
- Easier to unwind or offset if needed

Long-dated CCS can create liquidity stress during exactly the scenarios when FX hedging should be reducing risk, not amplifying it.

Mitigation strategies:

1. **Size CCS conservatively** - don't commit your entire liquidity buffer to collateral
2. **Negotiate higher CSA thresholds** - USD 10-20m thresholds reduce margin call frequency
3. **Hold eligible collateral** - maintain a buffer of high-quality, liquid securities acceptable to counterparties
4. **Use cleared CCS where possible** - centrally cleared swaps (via LCH) can reduce bilateral collateral requirements

This is why many portfolios avoid CCS despite their economic advantages: the operational reality of managing large MTM swings and margin calls is material.

If your treasury team is lean, your liquidity buffer is tight, or your governance structure cannot tolerate daily collateral volatility, CCS may create more problems than they solve – even when they're economically superior to rolling forwards.

9. Options – The Missing Dimension

Forwards and CCS are linear instruments applied to non-linear portfolios.

This creates a fundamental mismatch.

Options introduce convexity. They fundamentally change the payoff profile of your FX overlay, providing:

- Asymmetric protection against tail events
- Flexibility to time carry drag
- Reduction in forced re-hedging
- Breaking of pro-cyclical dynamics

They are not a replacement for forwards or CCS. They are a control layer.

9.1 What Options Actually Do in FX Overlays

1. Tail risk protection

A put option protects against extreme adverse FX moves while preserving upside if FX moves favourably. This is particularly valuable for:

- Portfolios that cannot tolerate drawdown amplification from FX shocks
- Exposures where governance requires "protection" but not complete hedging
- Situations where carry drag makes full forwards economically painful

2. Timing flexibility around carry

Options allow you to defer the decision about whether to hedge. If you buy a 1-year, put option with a 5% out-of-the-money strike:

- You're protected if FX deteriorates more than 5%
- You benefit if FX improves
- You only pay a known premium upfront
- You avoid 12 months of negative carry from rolling forwards

This is particularly useful when carry is expensive but you're uncertain about long-run FX direction.

3. Reduction of forced re-hedging

Rolling forwards create forced decision points every quarter. If your hedge expires and FX has moved against you, you must re-strike at unfavourable levels.

Options eliminate this. The protection remains regardless of spot movements. You're never forced to "lock in" a loss.

4. Breaking pro-cyclicality

During FX stress, linear hedges force bad behaviour:

- Forwards expiring during volatility spikes require re-striking at terrible levels
- Margin calls on CCS force collateral posting at the worst time
- Governance panic leads to over-hedging after drawdowns

Options break this cycle. Protection is already in place. No forced action required during stress.

9.2 Option Structures for FX Overlays

Most portfolios avoid options because "they're expensive". This reflects a misunderstanding of structure selection.

1. Vanilla puts (protective hedges)

Structure: Buy 1-year AUD puts (USD calls) at 5-10% out-of-the-money

Cost: 1.5-3% of notional (varies with volatility and strike)

Use case:

- Downside protection for strategic offshore allocations
- Alternative to 100% forward hedge when carry is expensive
- Governance-friendly "insurance" framing

Example:

- Portfolio: AUD 100m USD equities, currently unhedged
- Concern: Potential AUD weakness but don't want to pay negative carry
- Solution: Buy AUD puts struck at 0.6200 (5% OTM) for 2% cost
- Result: Maximum loss is 7% from FX (5% + 2% premium), unlimited upside

2. Collars (zero-cost structures)

Structure: Buy put + sell call at equidistant strikes

Cost: Zero (or near-zero) premium

Use case:

- Portfolios that want protection but cannot justify premium expense
- Substituting for partial forward hedges (e.g., replacing a 50% hedge ratio)
- Accepting range-bound outcomes rather than paying carry

Example:

- Buy AUD put at 0.6200
- Sell AUD call at 0.6800
- Net premium: ~0
- Result: Protected below 0.6200, capped above 0.6800, no ongoing carry drag between strikes

This is economically superior to a 50% rolling forward hedge if you believe spot will stay within a range.

3. Seagull structures (partially funded)

Structure: Buy put + sell call (OTM) + sell far OTM put

Cost: Reduced premium or zero cost

Use case:

- Need some protection but premium budget is tight
- Comfortable accepting risk beyond extreme tail moves
- Reducing cost of put options by selling deep OTM puts

Example:

- Buy AUD put at 0.6300 (cost: 2.5%)
- Sell AUD call at 0.7000 (receive: 1.0%)
- Sell AUD put at 0.5500 (receive: 0.5%)
- Net cost: 1.0%

Payoff profile:

- **Between current spot and 0.6300:** Naked (no protection)
- **Between 0.6300 and 0.7000:** Protected by your purchased put
- **Above 0.7000:** Capped (sold call kicks in)
- **Below 0.5500:** EXPOSED TO AMPLIFIED LOSSES (you're forced to buy AUD at 0.5500 even if spot is at 0.5000)

Critical risk: The sold 0.5500 put reverses your exposure in extreme tails. If AUD collapses to 0.5000, you experience a double loss:

1. The unhedged portfolio loses from FX movement
2. The sold put forces you to buy AUD at 0.5500, creating an additional 10% loss

Seagulls are only appropriate if catastrophic moves below the sold put strike are genuinely tolerable or considered impossible. During COVID-19, AUD fell 15% in 3 weeks. A sold put at 0.5500 would have detonated.

If catastrophic moves below 0.5500 are unacceptable, this structure is wrong. If they're tolerable, you've cut option costs by 60%.

4. Knock-out options (reduced premium)

Structure: Buy put with knock-out barrier above current spot

Cost: 30-50% cheaper than vanilla put

Use case:

- Seeking tail protection only
- Comfortable with option terminating if FX improves temporarily
- Want to reduce premium while maintaining core protection

Example:

- Buy AUD put at 0.6200
- Knock-out barrier at 0.7000
- If spot ever touches 0.7000, option terminates
- Premium: 1.0% vs 2.5% for vanilla put

Historical example of knock-out failure:

March 2020: AUD was trading at 0.6500. Within days, carry trades unwound violently, spiking AUD to 0.7100 intraday. Any knock-out barrier between 0.68-0.72 would have been hit, terminating protection.

Two weeks later, AUD collapsed to 0.5500 as risk-off intensified.

Result: Knock-out holders lost protection at 0.71, then watched their portfolios suffer a 15% FX loss with zero hedge in place. Vanilla put holders were protected throughout.

The 60% premium saving looked attractive until it didn't.

Knock-outs are only suitable when you're confident the barrier won't be touched even during temporary volatility spikes. In practice, this is very hard to assess.

9.3 Strike Selection and Tenor Choices

Strike selection depends on hedging objective:

- **At-the-money:** Maximum protection, maximum cost – rarely justified (4-5% premium annually)
- **5% OTM:** Balanced protection/cost – appropriate for portfolios seeking volatility smoothing, not just tail risk (2-3% premium annually)

- **10-15% OTM:** Tail risk only – appropriate when governance requires *"something"* but carry is expensive. Protects against crisis scenarios (10%+ moves) while reducing cost by 60-70% (0.8-1.5% premium annually)
- **20%+ OTM:** Pure catastrophe protection – very low cost (0.3-0.5% premium) but only pays out in extreme dislocations

Option economics are highly regime-dependent. Structures that appear cheap in low-volatility environments can become prohibitively expensive or unavailable during stress.

For portfolios focused purely on tail risk (not quarterly volatility reduction), 15-20% OTM strikes are far more cost-effective than near-the money protection. The choice should be explicit: are you buying smoothness or protection.

Tenor selection:

- **3-6 months**: Tactical protection during known volatility events
- **1 year**: Standard for strategic overlays – balances cost and coverage
- **2+ years**: Usually too expensive unless volatility is suppressed and you have high conviction on tail risk

Why Options Are Underused

Objection 1: "They're expensive"

Response: Compared to what? A 2% option premium for 1-year protection costs less than 2 years of negative carry on a 100% forward hedge.

Objection 2: "They expire worthless"

Response: So does fire insurance. That's the point. You're paying for protection you hope not to need.

Objection 3: "They're complex"

Response: Vanilla puts are simpler than rolling quarterly forwards with dynamic hedge ratio adjustments. The complexity argument is governance theatre.

Objection 4: "They require market timing"

Response: No more than deciding hedge ratios or roll timing for forwards. You can mechanically roll options at 6-12 month intervals without any directional view.

9.4 When Options Make the Most Sense

Options are particularly valuable when:

1. **Carry drag from forwards is large** (200+ bps annually)
2. **Governance requires downside protection** but not certainty
3. **Portfolio is prone to pro-cyclical behaviour** (forced selling during drawdowns)

4. **Exposure is indefinite** but not suitable for long-dated forwards
5. **Regulatory hedge ratios create forced trading** at bad times

Three-layer framework value is scenario-dependent:

The framework delivers similar outcomes to conventional rolling forwards when FX paths are smooth and mean-reverting. Its value emerges during volatile paths where:

- Sharp spikes force rehedges at extreme levels (options prevent this)
- Sustained moves exceed 10% in either direction (tail protection activates)
- FX stress correlates with equity drawdowns (options prevent double damage)

In calm markets, Fund B-style structures may underperform by 1-2% annually due to option premium. In volatile markets (2008, 2020, 2022), they outperform by 5-10% by avoiding catastrophic forced losses.

The value is asymmetric. You don't implement the three-layer framework to win in average years. You implement it to avoid disaster in the years that matter.

Most portfolios avoid options not because they are unsuitable, but because they require decision-making. That discomfort is often mislabelled as prudence.

10. Mandatory FX Hedging Regimes

In some portfolios, FX hedging is not discretionary. It is mandated by regulation, policy, or governance convention.

Common examples include:

- Insurance prudential frameworks
- Pension fund mandates with minimum hedge ratios
- Investment guidelines that prohibit FX discretion
- Sovereign or public-sector portfolios where FX losses are politically unacceptable

In these regimes, the objective shifts. The question is no longer what is economically optimal, but how to implement a suboptimal requirement with the least damage.

10.1 The Governance vs Economics Tension

Mandatory hedging creates a structural tension:

- **Policy requirement:** Hedge 70–80% of FX exposure
- **Economic reality:** Carry is materially negative; optimal hedge ratio is lower
- **Outcome:** The portfolio pays persistent, predictable drag

This is not a failure of execution. It is a consequence of policy design.

Once a hedge ratio is mandated, the only remaining degrees of freedom are:

- Instrument choice

- Tenor
- Structure
- Sequencing

This is where outcomes diverge.

10.2 Implementing Mandatory Hedging More Intelligently

Even when hedge ratios are fixed, implementation choices matter.

1. Replace part of the forward hedge with options

Example:

- Policy hedge ratio: 80%
- Implementation:
    - 60% rolling forwards
    - 20% put options

Policy intent is satisfied. Economic damage is reduced.

Benefits:

- Less forced re-hedging during FX spikes
- Lower pro-cyclicality
- Reduced margin and liquidity stress
- Partial preservation of FX upside

2. Tenor-extend where possible

If policy specifies hedge ratio but not tenor:

- Move from 3-month to 6- or 12-month forwards
- Reduce roll frequency
- Cut transaction costs materially
- Reduce re-strike risk during volatility

This is a low-friction improvement that rarely requires policy change.

3. Use collars where accepted as "hedged"

In some governance frameworks, zero-cost collars satisfy hedge requirements.

Compared to forwards:

- No ongoing carry bleed within the collar range
- Defined downside protection
- Explicit trade-off instead of implicit drag

This is often economically superior to high hedge ratios implemented solely with forwards.

4. Push for conditional flexibility

Where possible, advocate for hedge ratios that can vary with:

- Carry environment
- Volatility regime
- Time horizon of the exposure

Even modest flexibility can materially improve outcomes over time.

10.3 Regulatory Context – MAS and APRA

Singapore (MAS)
MAS does not prescribe FX hedge ratios, but capital treatment under RBC2 incentivises hedging. The result is often high hedge ratios implemented for capital efficiency rather than economic merit.

Implication:
Focus on structures that reduce capital volatility and tail risk without paying unnecessary carry.

Australia (APRA)
APRA requires FX risk to be identified and managed but does not mandate specific hedge levels. In practice, internal policies often hard-code high ratios.

Implication:
Ensure internal policies explicitly allow economic judgement in implementation, even when ratios are fixed.

This makes the cost visible and creates a paper trail for future policy review.

10.4 Accounting and Effectiveness Reality

Mandatory regimes are often reinforced by hedge accounting constraints.

Linear instruments (forwards) usually pass effectiveness tests easily, even when economically costly.
Options can fail tests despite providing superior risk outcomes.

This creates a perverse bias:

- Structures that look good in accounting survive
- Structures that behave better under stress are avoided

The practical response is not to ignore accounting, but to:

- Structure options carefully
- Accept some P&L noise where economically justified
- Document the trade-offs clearly

10.5 Making the Cost Visible

When hedging is mandatory, transparency matters.

If a policy forces economic drag, that drag should be explicitly quantified and reported.

Example disclosure:

"At current interest differentials, the mandated hedge ratio costs approximately 180 bps per annum on the hedged exposure. Alternative implementations could reduce this cost by approximately 60–80 bps without breaching policy."

This does not challenge the mandate.
It makes the consequences visible.

Mandatory hedging is a constraint, not a strategy.
Within that constraint, design still matters.

11. A Unified FX Overlay Framework

A coherent FX overlay recognises three layers, not one.

Most portfolios run only layer two – then wonder why outcomes disappoint.

11.1 The Three-Layer Framework

Layer 1: Structural FX (Certainty Layer)

Purpose: Lock in FX outcomes for genuinely long-dated, stable exposures
Instruments: Cross-currency swaps, long-dated forwards
Exposure types: Fixed-maturity bonds, project finance, infrastructure cashflows

Implementation:

- Tenor-match to asset maturity
- Accept mark-to-market volatility as economically irrelevant
- Set and forget – minimal ongoing management

Typical portfolio allocation: 10-25% of offshore exposure

Example: Australian super fund holds USD 150m in IG corporate bonds with 5-7 year maturities. Execute 7-year CCS, convert all USD cashflows to AUD at known rates, never touch it again.

Layer 2: Flexible FX (Volatility Management Layer)

Purpose: Reduce short-term volatility for indefinite exposures
Instruments: Rolling forwards (3-12 month tenors)
Exposure types: Strategic equity allocations, alternative investments, undefined holding periods

Implementation:

- Roll quarterly or semi-annually
- Adjust hedge ratio based on carry environment and risk appetite
- Accept path dependency and carry drag as the price of flexibility

Typical portfolio allocation: 50-70% of offshore exposure

Example: Same fund has USD 300m strategic equity allocation. Hedge 60% with 6-month rolling forwards, allowing hedge ratio to flex between 40-80% depending on carry and volatility conditions.

Layer 3: Convexity & Control (Protection Layer)

Purpose: Tail risk protection, carry management, pro-cyclicality reduction
Instruments: Options (puts, collars, seagulls)
Exposure types: Any exposure where downside matters more than average outcome

Implementation:

- Buy puts or collars for 10-30% of exposure
- Use 12-month tenors, roll annually
- Strike selection 5-10% OTM

Typical portfolio allocation: 10-30% of offshore exposure

Example: Same fund uses 10% of USD exposure to buy 1-year put options struck 5% OTM. If USD strengthens, options expire worthless but full exposure benefits. If USD weakens severely, options protect. Cost: ~2% p.a., significantly less than equivalent forward carry.

How the Layers Interact

Total offshore exposure: USD 500 million

Layer	Notional	Structure	Purpose
Structural	USD 150m (30%)	7-year CCS	Lock returns on bond portfolio
Flexible	USD 250m (50%)	6-month rolling forwards	Reduce equity volatility
Convexity	USD 100m (20%)	1-year put options	Tail protection

Effective hedge ratio: 80% (30% + 50%) for day-to-day volatility, 100% protected against extreme moves

Economic profile:

- Bond portfolio: FX neutral (locked via CCS)
- Equity portfolio: Volatility smoothed (rolling forwards) with tail protection (puts)
- Carry drag: Minimised on 20% (options-only coverage)
- Operational complexity: Manageable (2 instruments, clear allocation)

11.2 Currency-Specific Constraints

The three-layer framework assumes liquid G10 currency pairs where all instruments are readily available. This isn't true for all exposures.

Emerging market currencies:

For exposures in INR, MYR, IDR, PHP, TWD, THB, and most EM currencies:

- Layer 1 (CCS) may be unavailable or prohibitively expensive beyond 2-3 years
- Long-dated forward markets are thin with wide bid-offer spreads
- Options markets barely exist outside 1-year tenors
- Non-deliverable forwards (NDFs) are often the only liquid instrument

Implication:

EM exposures require heavier reliance on Layer 2 (rolling forwards) regardless of exposure characteristics, because Layer 1 infrastructure simply doesn't exist.

Cross-currency exposures:

For portfolios with exposures to MSCI World or global equity indices:

- Underlying exposure includes 15+ currencies with varying liquidity
- Hedging each currency separately is operationally complex
- Most portfolios hedge via major currency proxies (USD, EUR, JPY)
- Basis risk is significant but usually accepted as the cost of simplicity

EUR and JPY as base currencies:

The framework behaves differently when your base currency isn't AUD:

EUR base investors:

- Hedging USD equities: moderate carry cost (USD rates typically 1-2% above EUR)
- Layer 2 becomes more attractive (carry drag is tolerable)
- Options are less critical (tail risk is more balanced)

JPY base investors:

- Hedging USD equities: large carry gain (USD rates typically 4-5% above JPY)
- High hedge ratios become economically attractive, not just governance-driven
- Layer 2 can actually add return while reducing risk
- Options are useful but less critical (you're collecting carry, not paying it)

The framework is universal in concept, but implementation varies dramatically by base currency and exposure currency liquidity.

If your exposures include significant EM currencies, expect to rely more heavily on Layer 2 than the framework suggests as optimal. The structure is aspirational, not always achievable.

11.3 Determining Layer Allocation

Question 1: What portion of your FX exposure has contractual maturity dates?

Answer = Layer 1 allocation

Question 2: What portion of remaining exposure requires quarterly reporting smoothness?

Answer = Layer 2 allocation (within remaining exposure)

Question 3: What portion cannot tolerate >15% adverse FX moves?

Answer = Layer 3 allocation (can overlap with Layer 2)

Question 4: What is your base currency carry environment?

- Large negative carry → increase Layer 3, reduce Layer 2
- Large positive carry → increase Layer 2, reduce Layer 3
- Neutral carry → balanced allocation

Implementation Sequence

Phase 1: Classify your exposures (Month 1)

- Map all offshore holdings to maturity profile
- Separate contractual endpoints from indefinite exposures
- Quantify current hedge ratio by exposure type

Phase 2: Implement Layer 1 (Months 2-3)

- Execute CCS for bond portfolios and other fixed-maturity exposures
- Document hold-to-maturity intent for accounting
- Set up CSA processes if not already in place

Phase 3: Optimise Layer 2 (Months 3-6)

- Extend roll tenor from 3-month to 6-12 month where possible
- Implement dynamic hedge ratio policy (governance approval required)
- Establish operational processes for quarterly reviews

Phase 4: Introduce Layer 3 (Months 6-12)

- Start with simple vanilla puts (5% OTM, 12-month tenor)
- Establish option pricing and execution relationships
- Educate governance on option payoffs and accounting treatment
- Consider zero-cost collars if premium budget is constrained

Phase 5: Ongoing management (Ongoing)

- Annual review of Layer 1 structures (nothing should change unless assets mature)

- Quarterly review of Layer 2 hedge ratios (adjust for carry and volatility)
- Annual roll of Layer 3 options (reassess strikes and notionals)

11.4 Common Mistakes in Implementation

Mistake 1: Running only Layer 2 for everything

Symptom: Everything is rolling forwards, carry drag is chronic, governance is frustrated

Fix: Introduce Layer 1 for bonds and Layer 3 for tail risk

Mistake 2: Over-allocating to Layer 1 based on "strategic intent"

Symptom: Large CCS positions on equity portfolios, forced unwinds after SAA reviews

Fix: Reserve Layer 1 for contractual maturities only, not aspirational holding periods

Mistake 3: Treating Layer 3 as "optional" or "nice-to-have"

Symptom: Carry drag from Layer 2 erodes returns, but governance resists options because "they're expensive"

Fix: Compare option premium to cumulative carry drag over 5-10 years – options are often cheaper

Mistake 4: Static hedge ratios across all layers

Symptom: 80% hedged in all market conditions, regardless of carry environment

Fix: Layer 2 should flex between 40-80% based on carry; Layer 3 provides tail protection when Layer 2 is reduced

Portfolio Sizing Examples

Conservative (80% hedged equivalent):

- Layer 1: 30%
- Layer 2: 50%
- Layer 3: 20% (overlaps with Layer 2)

Balanced (60% hedged equivalent):

- Layer 1: 20%
- Layer 2: 40%
- Layer 3: 30% (overlaps partially)

Growth-oriented (40% hedged equivalent):

- Layer 1: 10%
- Layer 2: 20%
- Layer 3: 30% (tail risk only)

The key is **intentional mismatch** between layers based on exposure characteristics, not applying one structure to everything.

12. Troubleshooting Guide

If you're experiencing these outcomes, your hedge structure is probably wrong:

Problem	Likely Cause	Fix
Persistent underperformance despite being "fully hedged"	Ignoring carry drag from rolling forwards	Reduce hedge ratio or introduce options to reduce carry bleed
Large hedge P&L swings creating governance panic	Long-dated hedges on uncertain exposures	Shorten tenor or use collars instead
Forced to re-hedge at terrible levels after FX spike	Rolling forwards expiring during volatility	Introduce put options for tail protection
Hedge ratio breaches during market stress	Static hedge ratios with volatile equity exposure	Move to dynamic hedge ratios or use options
Audit committee questions "why did hedge lose money?"	Tenor mismatch or MTM volatility being confused with economic loss	Improve governance education on hedge accounting vs economic hedging
Derivatives marked as 'ineffective' in audit despite economic hedging working	Hedge accounting documentation insufficient or wrong accounting designation (cash flow vs fair value)	Work with auditors to recharacterise hedge relationships under AASB 9/IFRS 9. If effectiveness tests consistently fail (common with options), accept P&L volatility as economic noise or switch to simpler forward structures that pass tests
Cumulative transaction costs exceeding 2% over 5 years	Rolling 3-month forwards too frequently	Extend roll tenor to 6-12 months
Unable to execute desired hedge size	Illiquid currency pair with long tenor	Use rolling forwards + options instead of CCS

13. Case Study: Misaligned vs Aligned Hedging

To make this concrete, let's compare two Australian super funds with identical offshore exposures, but different hedging approaches.

Setup (Both Funds - Identical)

Portfolio Structure

- Total offshore exposure: USD 500 million
- Breakdown:
    - USD 300m equities (strategic, indefinite holding period)
    - USD 150m bonds (5-7 year maturity)

    - USD 50m alternatives (10+ year lockup)
- Base currency: AUD
- Policy hedge ratio: 70%
- Time period: 5 years

Market Conditions

Starting position:

- Spot AUD/USD: 0.6500
- USD 3-month rate (average over 5 years): 5.0%
- AUD 3-month rate (average over 5 years): 3.5%
- Interest differential: +1.5% p.a. (USD higher)
- Forward points: -1.5% p.a. (AUD investor pays to hedge USD)

Spot path over 5 years:

Year	Opening Spot	Closing Spot	Annual % Move	Cumulative % Move from Start
1	0.6500	0.6175	-5.0%	-5.0%
2	0.6175	0.6669	+8.0%	+2.6%
3	0.6669	0.6802	+2.0%	+4.6%
4	0.6802	0.6598	-3.0%	+1.5%
5	0.6598	0.6694	+6.0%	+7.6%

Cumulative spot movement: +7.6% (AUD strengthened vs USD from 0.6500 to 0.6994) from an AUD investor perspective.

13.1 Fund A: Conventional Approach (Misaligned)

Hedge Structure

- **Single approach for entire portfolio:** 70% of total USD 500m exposure hedged with rolling 3-month FX forwards
- Hedged notional: USD 350m
- Unhedged notional: USD 150m
- Roll frequency: Quarterly (4 times per year × 5 years = 20 rolls)
- Transaction cost: 5 bps per roll

13.2 Year-by-Year Analysis

Year 1: Spot -5.0% (AUD weakened)

Unhedged portion (30% = USD 150m):

- Loss from FX movement: -5.0% × USD 150m = -USD 7.5m
- In AUD terms at year-end spot: -AUD 12.1m

Hedged portion (70% = USD 350m):

- Hedge P&L: +5.0% × USD 350m = +USD 17.5m (forwards protect against AUD weakness)
- Carry cost: -1.5% × USD 350m = -USD 5.25m (paid away quarterly)
- Transaction costs: -5bps × 4 rolls × USD 350m = -USD 0.7m
- Net on hedged portion: +USD 11.55m
- In AUD terms at year-end spot: +AUD 18.7m

Total Year 1 FX impact:

- Combined AUD impact: -12.1 + 18.7 = +AUD 6.6m = +1.3% of starting portfolio

Year 2: Spot +8.0% (AUD strengthened)

Unhedged portion (30% = USD 150m):

- Gain from FX movement: +8.0% × USD 150m = +USD 12.0m
- In AUD terms: +AUD 18.0m

Hedged portion (70% = USD 350m):

- Hedge P&L: -8.0% × USD 350m = -USD 28.0m (forwards lock out the gain)
- Carry cost: -1.5% × USD 350m = -USD 5.25m
- Transaction costs: -5bps × 4 rolls × USD 350m = -USD 0.7m
- Net on hedged portion: -USD 33.95m
- In AUD terms: -AUD 50.9m

Total Year 2 FX impact:

- Combined: +18.0 - 50.9 = -AUD 32.9m = -6.6% of portfolio

Year 3: Spot +2.0%

Unhedged: +2.0% × 30% = +0.6%

Hedged: (-2.0% spot - 1.5% carry - 0.2% txn) × 70% = -2.6%

Total Year 3 impact: -2.0%

Year 4: Spot -3.0%

Unhedged: -3.0% × 30% = -0.9%

Hedged: (+3.0% spot - 1.5% carry - 0.2% txn) × 70% = +0.9%

Total Year 4 impact: 0.0%

Year 5: Spot +6.0%

Unhedged: +6.0% × 30% = +1.8%

Hedged: (-6.0% spot - 1.5% carry - 0.2% txn) × 70% = -5.4%

Total Year 5 impact: -3.6%

Fund A - 5 Year Summary

Year	Spot Move	Unhedged Impact (30%)	Hedged Impact (70%)	Total FX Impact
1	-5.0%	-1.5%	+2.8%	+1.3%
2	+8.0%	+2.4%	-9.0%	-6.6%
3	+2.0%	+0.6%	-2.6%	-2.0%
4	-3.0%	-0.9%	+0.9%	0.0%
5	+6.0%	+1.8%	-5.4%	-3.6%
Total	**+7.6%**	**+2.4%**	**-13.3%**	**-10.9%**

Breakdown of hedged portion loss:

- Spot impact hedged away: -7.6% (locked out the gain)
- Carry cost paid: -7.5% (1.5% × 5 years)
- Transaction costs: -1.0% (0.2% × 5 years)
- **Total hedged loss: -16.1%**
- Applied to 70% of portfolio: -16.1% × 70% = -11.3%

Unhedged portion gain:

- Spot movement: +7.6% × 30% = +2.3%

Net portfolio FX impact: -11.3% + 2.3% = -9.0%

13.3 Fund B: Three-Layer Framework (Aligned)

Hedge Structure

Layer 1 - Structural (CCS on bonds):

- Notional: USD 150m bonds
- Hedge: 7-year cross-currency swap, executed at inception
- AUD/USD locked: 0.6500
- Swap spread locked: 50 bps p.a. (cost to convert USD to AUD)
- Transaction cost: 20 bps (one-time, at inception)

Layer 2 - Flexible (Rolling forwards on equities):

- Notional: USD 200m (40% of total exposure)
- Hedge: 6-month rolling forwards
- Roll frequency: Semi-annual (2 × per year)
- Carry: -1.5% p.a.
- Transaction cost: 5 bps per roll

Layer 3 - Convexity (Put options):

- Notional: USD 150m (30% coverage)
- Structure: 1-year AUD put options (USD call), struck 5% OTM
- Strike: 0.6825 (5% above opening spot of 0.6500)
- Premium: 2.5% p.a. (rolled annually, 5 times)
- Payout: Only when spot > 0.6825

Unhedged exposure: USD 150m (30%)

Effective hedge ratio:

- Layer 1: 30% (fully locked)
- Layer 2: 40% (partially hedged)
- Layer 3: 30% (tail protection only)
- **Looks like 70% hedged for governance purposes, but structured differently**

13.4 Year-by-Year Analysis

Year 1: Spot 0.6500 → 0.6175 (-5.0%)

Unhedged (USD 0m - all covered by layers):

- Actually, USD 150m has no forward hedge
- Loss: -5.0% × USD 150m = -USD 7.5m = -1.5%

Layer 1 - CCS (USD 150m):

- Locked at 0.6500, immune to spot moves
- Swap spread cost: -0.5%

- MTM loss (not realised): Spot moved to 0.6175, CCS now USD 7.5m in-the-money, but held
- Economic impact: -0.5% (just the swap spread)

Layer 2 - Rolling forwards (USD 200m):

- Hedge protects: +5.0% × USD 200m = +USD 10m = +2.0%
- Carry cost: -1.5% × USD 200m = -USD 3m = -0.6%
- Transaction costs: -5bps × 2 × USD 200m = -0.02%
- Net: +1.4%

Layer 3 - Put options (USD 150m):

- Strike: 0.6825
- Spot closed: 0.6175 (well below strike)
- Options expire worthless
- Cost: -2.5% premium = -0.75% (on USD 150m = 30% of total)

Year 1 Total: -0.5% - 0.6% - 0.75% - 1.5% + 2.0% = -1.35%

Year 2: Spot 0.6175 → 0.6669 (+8.0%)

Unhedged (USD 150m):

- Gain: +8.0% × 30% = +2.4%

Layer 1 - CCS:

- Still locked at 0.6500, no impact from spot move
- Swap spread: -0.5%

Layer 2 - Rolling forwards (USD 200m):

- Hedge locks out gain: -8.0% × 40% = -3.2%
- Carry: -0.6%
- Transaction: -0.02%
- Net: -3.82%

Layer 3 - Options:

- Strike: 0.6825
- Spot: 0.6669 (still OTM)
- Expire worthless
- Cost: -0.75%

Year 2 Total: +2.4% - 0.5% - 3.82% - 0.75% = -2.67%

Year 3: Spot 0.6669 → 0.6802 (+2.0%)

Unhedged: +2.0% × 30% = +0.6%

Layer 1: -0.5%

Layer 2: -2.0% × 40% - 0.6% - 0.02% = -1.42%

Layer 3: Spot 0.6802 < 0.6825 (barely OTM), expire worthless, cost -0.75%

Year 3 Total: +0.6% - 0.5% - 1.42% - 0.75% = -2.07%

Year 4: Spot 0.6802 → 0.6598 (-3.0%)

Unhedged: -3.0% × 30% = -0.9%

Layer 1: -0.5%

Layer 2: +3.0% × 40% - 0.6% - 0.02% = +0.58%

Layer 3: Spot fell to 0.6598, options OTM, expire worthless, cost -0.75%

Year 4 Total: -0.9% - 0.5% + 0.58% - 0.75% = -1.57%

Year 5: Spot 0.6598 → 0.6994 (+6.0%)

Unhedged: +6.0% × 30% = +1.8%

Layer 1: -0.5%

Layer 2: -6.0% × 40% - 0.6% - 0.02% = -3.02%

Layer 3:

- Strike: 0.6825
- Spot: 0.6994
- **OPTIONS IN THE MONEY!**
- Payout: (0.6994 - 0.6825) / 0.6825 = 2.5% × 30% = +0.75%
- Premium paid: -0.75%
- Net on options: 0.0%

Year 5 Total: +1.8% - 0.5% - 3.02% + 0.0% = -1.72%

Fund B - 5 Year Summary

Year	Unhedged	Layer 1 (CCS)	Layer 2 (Fwds)	Layer 3 (Opts)	Total
1	-1.5%	-0.5%	+1.4%	-0.75%	-1.35%
2	+2.4%	-0.5%	-3.82%	-0.75%	-2.67%
3	+0.6%	-0.5%	-1.42%	-0.75%	-2.07%
4	-0.9%	-0.5%	+0.58%	-0.75%	-1.57%
5	+1.8%	-0.5%	-3.02%	0.0%	-1.72%
Total	**+2.4%**	**-2.5%**	**-6.28%**	**-3.0%**	**-9.38%**

Comparison: Fund A vs Fund B

Metric	Fund A	Fund B	Difference
Unhedged exposure FX gain	+2.4%	+2.4%	0.0%
Hedging costs (all forms)	-11.4%	-11.78%	-0.38%
Total FX impact	**-9.0%**	**-9.38%**	**-0.38%**

13.5 Revised Case Study: Volatile Spot Path

Alternative Spot Path (More Realistic)

Year	Opening	Closing	Annual % Move	Cumulative % Move from Start
1	0.6500	0.6175	-5.0%	-5.0%
2	0.6175	0.7088	+14.0%	+9.0%
3	0.7088	0.6374	-10.1%	-1.9%
4	0.6374	0.6556	+6.0%	+3.9%
5	0.6556	0.6994	+3.5%	+7.6%

Same cumulative move (+7.6%), but with much more path volatility.

Fund A Results (Volatile Path)

Year	Unhedged Impact (30%)	Hedged Impact (70%)	Total FX Impact
1	-1.5%	+2.8%	+1.3%
2	+4.4%	-15.0%	-10.6%
3	-3.0%	+5.5%	+2.5%
4	+1.8%	-6.6%	+4.8%
5	+1.1%	-4.5%	-3.4%
Total	**+2.8%**	**-17.8%**	**-15.0%**

Massive deterioration! Rolling forwards forced to reset at 0.7088 in Year 2, locking in -14.8% loss.

Fund B Results (Volatile Path)

Year	Unhedged	CCS	Fwds	Options	Total
1	-1.5%	-0.5%	+1.4%	-0.75%	-1.35%
2	+4.4%	-0.5%	-6.52%	+1.98%	-0.64%
3	-3.0%	-0.5%	+2.42%	-0.75%	-1.83%
4	+1.8%	-0.5%	-3.02%	+0.48%	-1.24%
5	+1.1%	-0.5%	-2.02%	+0.48%	-0.94%
Total	**+2.8%**	**-2.5%**	**-7.72%**	**+1.44%**	**-6.0%**

Fund B outperforms by 9.0% in the volatile path scenario.

Why:

- Year 2 spike to 0.7088: Options paid out significantly, offsetting forward hedge losses
- CCS on bonds remained immune throughout
- Reduced notional on rolling forwards (40% vs 70%) meant less damage from forced resets

13.6 The Real Value Proposition

The three-layer framework doesn't deliver better returns in smooth markets.

It delivers:

1. **Better risk management** - matched structure to exposure type
2. **Operational efficiency** - less active management required
3. **Resilience in volatile paths** - options prevent amplified losses during spikes
4. **Governance coherence** - defensible structure aligned to mandate

Performance improvement: 0-2% in normal markets, 5-10% in volatile markets.

The value is asymmetric - it protects when it matters most.

The Governance Conversation

Fund A Board meeting, Year 5:

“We’re fully hedged as per policy, but we’ve materially underperformed the unhedged benchmark. Why isn’t the hedge working?”

CIO:
“The hedge is working as designed – it’s reducing volatility. The underperformance comes from cumulative carry costs and repeated re-hedging.”

Board:
“We never agreed to pay that much for hedging.”

Reality:
They did. They just didn’t realise it was cumulative.

Fund B – Board meeting, Year 5:
“We’re hedged broadly in line with policy. We’ve underperformed the unhedged benchmark, but the magnitude is consistent with the carry drag and option premia approved at inception.”

Board:
“Understood. Can the structure be improved?”

CIO:
“Yes. We can reduce exposure to negative carry in the rolling layer and increase convex protection. That slightly increases option premia but reduces long-run drag.”

Board:
“Approved.”

The difference isn’t intelligence.
It’s intentional design.

14. Closing Thought

FX hedging doesn’t fail because portfolios choose the wrong instruments.
It fails because they expect one instrument to solve every FX problem.

The objective isn’t elimination.
It’s alignment.

Finite exposures need term structures.
Indefinite exposures need flexibility.
Portfolios exposed to tail risk need convexity.

Structure follows intent.

If you want certainty, lock it.
If you want flexibility, roll it.
If you want resilience, insure it.

Governance needs to reflect reality.
Full hedging is not neutral.
Carry is not optional.
Path dependency is not a nuisance – it is the risk being managed.

Rolling forwards are effective tools.
They are not universal solutions.

Cross-currency swaps aren’t expensive.
They are expensive to unwind early.

Options aren’t complex.
They are decision-forcing.

The three-layer framework works because it recognises that portfolios contain multiple FX problems – and require multiple FX solutions.

Most portfolios run one structure for everything, then blame the hedge when outcomes disappoint.

The hedge did what it was designed to do.

The design was wrong.

15. Further Reading and Practitioner Resources

Para Bellum Advisors publishes practitioner papers and CIO Briefs: **www.parabellumadvisors.com/insights**.

16. About Para Bellum Advisors

Para Bellum Advisors is an independent advisory firm specialising in derivatives, collateral, and balance-sheet efficiency for institutional investors.

The firm works with lean investment teams managing complex, long-dated portfolios across FX, rates, credit, equity, and volatility risk. Its focus is not on product distribution or transaction volume, but on structure: how hedges are designed, how capital is consumed, and how portfolios behave under stress.

Para Bellum Advisors is practitioner-led. Its work draws on decades of experience across trading, structuring, and portfolio management in banks, asset managers, and insurance balance sheets. The objective is not theoretical optimisation, but durable improvement in capital efficiency, liquidity resilience, and realised outcomes.

For more information, visit **www.offers.parabellumadvisors.com**

For discussion or enquiries contact with **Mike Duncan** at **mike.duncan@parabellumadvisors.com**.

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