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Currency hedging: When one size doesn't fit all

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What works as an optimal
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Rather than treating currency
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1. Introduction

A US-based retailer orders goods from a supplier in China—to be paid in 90 days, in Chinese yuan. A Swiss investor buys an S&P 500 tracker. A British retiree living in Australia receives a pension, in pounds sterling. All three are exposed to the foreign exchange markets, where close to USD 10 tn is traded each day. These vast flows produce currency swings that can hurt profits, erode investments, and dent cross-border transfers.

In all three cases, the currency risk can be mitigated with hedging—a way of reducing or removing the risk of being caught on the wrong side of a foreign exchange swing. For many investors, currency fluctuations have long been seen as a risk to be eliminated, often resulting in an all-or-nothing approach to hedging. Investors typically either fully hedge their portfolios or leave them entirely unhedged.

Our research challenges this conventional wisdom. While it is true that foreign exchange moves introduce risk, they also introduce expected returns which may be favourable or unfavourable to the investor, depending on the assets and currency pairs involved. Furthermore, the risks and expected returns evolve over time with market conditions, monetary policy changes and external shocks. In our study, we examine a range of currency hedging strategies from the perspective of investors with different reference currencies, investing across different asset classes globally.

The evidence shows that the ideal hedge ratio can shift significantly over time, depending on the currency pair and asset class in question. What works as an optimal strategy for one investor or asset class may not suit another. Rather than treating currency hedging as a binary decision, we argue it should be viewed through the lens of risk-adjusted returns and integrated into the broader investment and portfolio construction process.

Optimal currency hedging, we find, should be dynamic and tailored to the specific assets and currencies involved. In some cases, hedging may not be beneficial at all; in others, it could even make sense to hedge more than 100% of the principal exposure, where feasible.

For multi-currency portfolios, our analysis suggests that a dynamic approach is particularly warranted. Some currency risk is naturally diversified away at the portfolio

level, meaning less exposure may need to be hedged compared to a single-currency portfolio invested in one asset class.

Our study evaluates different hedging strategies across five reference currencies—Swiss franc, US dollar, euro, Japanese yen, and British pound—spanning three asset classes (equities, government bonds, and high-yield credit) and four multi-currency portfolios, over a period of more than 25 years. This report distils the main findings from a more comprehensive study, focusing on how investors can manage exchange rate uncertainty in their portfolios.

We assess four hedging strategies: two dynamic and two static. Dynamic strategies actively adjust the hedge ratio in response to market conditions, currency movements, or economic indicators, aiming to optimise the balance between risk and return. Static strategies, by contrast, maintain a fixed hedge ratio over time.

Our findings highlight the importance of a nuanced, flexible approach to currency hedging—one that recognises the diversity of investor needs, asset classes, and market environments. As we show, in the currency markets, *one size does not fit all*.

The dynamic approaches we analyse are the minimum variance and minimum variance bounded strategies, both inspired by academic research that increasingly favours bespoke, adaptive hedging. For comparison, we also include two static industry standards: always hedging 100% of the principal, or not hedging at all.

Minimum variance strategies determine the hedge ratio by analysing the correlation between investment returns and currency risk. This ratio is not static—it evolves as market conditions and correlations change, and varies by currency and asset class.

Our findings highlight the importance of a nuanced, flexible approach to currency hedging—one that recognises the diversity of investor needs, asset classes, and market environments. As we show, in the currency markets, *one size does not fit all*.

2. Literature review

The conventional wisdom on hedging has evolved over time, with the direction of travel in academic thinking offering insights, on which our analysis builds.

For many years, currency risk was seen as an unwelcome source of volatility—something to be hedged or eliminated to maximise the benefits of global diversification. This led many institutional investors, especially in fixed income, to fully hedge their foreign exchange exposure, often without considering the impact on expected returns (Grubel, 1968; Levy and Sarnat, 1970).

This perspective began to shift as academic research revealed that forward exchange rates are not reliable predictors of future spot rates. In particular, empirical studies found that Uncovered Interest Parity (UIP)—which posits that the expected change in the spot exchange rate should equal the interest rate differential between two countries—does not hold in practice. Instead, the forward rate is often a biased predictor of the future spot rate, and currencies with higher interest rates tend to appreciate rather than depreciate. This empirical anomaly is known as the "forward premium puzzle" (Fama, 1984).

The failure of UIP and the presence of the forward premium puzzle suggest that investors are compensated for bearing currency risk, giving rise to currency risk premia. These premia can significantly influence the expected returns of investments involving foreign currencies.

Currencies carry significant, time-varying risk premia linked to global risks, macroeconomic conditions, and safe-haven status.

These deviations from UIP can materially impact investment returns, depending on the currencies involved and their relationship with the underlying assets. Consequently, investors in different countries face distinct risks and opportunities from currency movements—factors that are essential to consider in portfolio construction (Adler and Dumas, 1983). This has underscored that the most effective strategy is a customised currency hedge, tailored to the investor's specific profile and objectives.

UIP deviations have allowed investors to profit by borrowing in low-interest-rate currencies and investing in high-interest-rate ones—a strategy known in the industry as the "carry trade." These profits have proven to be persistent and significant, although there are periods during which the strategy performance breaks down (Burnside et al., 2006). Further research has shown that currency risk premia are closely linked to global risk factors, with high-yielding currencies often suffering in times of market stress. "Safe" currencies tend to offer lower returns, while riskier ones must pay a premium to attract investors (Farhi and Gabaix, 2016).

These insights have important implications for portfolio management. They challenge the old belief that currency risk is a zero-sum inconvenience to be fully hedged. Instead, they suggest that currency risk can be a source of compensated risk, requiring a more dynamic approach to hedging—one that aims not only to manage volatility but also to capture some of the available risk premia (Campbell et al., 2010).

These insights … challenge the old belief that currency risk is a zero-sum inconvenience to be fully hedged.

Similarly, the old ideas of a universal, one-size-fits-all hedge ratio has not stood up to real-world scrutiny and the test of time. Such approaches assume frictionless markets and identical investor preferences, which simply do not exist in practice (Black, 1989). In fact, static hedge ratios have performed poorly, failing to account for changing risk factors and market conditions. As a result, the focus has shifted toward dynamic, conditional hedging strategies that integrate currency exposure directly into portfolio construction (Campbell et al., 2010).

Recent research has also highlighted the macroeconomic impact of dynamic currency hedging. The demand for hedging by global investors fluctuates significantly over time and can drive large swings in exchange rates (Bräuer and Hau, 2023). Hedge ratios that adapt to market conditions—such as volatility, risk premia, and hedging pressure—have outperformed simple static rules in both risk and return (Castro et al., 2025). Institutional investors already show strongly time-varying hedging behaviour, and fixed mandates are increasingly at odds with both the latest research and observed practice.

Optimal hedging also depends on the investor's reference currency and the assets being hedged. For those whose reference currency is a safe haven, hedging foreign exposures can increase diversification by reducing the correlation between asset and currency risk (Ranaldo and Söderlind, 2010). Safe-haven currencies generally have low or negative risk premia, while high-yielding currencies offer significant positive premia, especially in debtor countries (Della Corte et al., 2016).

The most effective strategy is a customised currency hedge, tailored to the investor's specific profile and objectives.

If global capital markets were perfectly integrated and free of frictions, hedging currency risk would hardly matter. In reality, however, markets are far from perfect. Transaction costs, capital controls, and market segmentation mean that currency risk is a real concern—one that cannot fully be diversified away even in the context of an internationally diversified portfolio (Adler and Dumas, 1983).

The current consensus is that currencies carry significant, time-varying risk premia linked to global risks, macroeconomic conditions, and safe-haven status. Currency exposures are a crucial part of strategic asset allocation (Castro et al., 2025). For long-term investors, some foreign currency exposure can help mitigate real-rate and macro risks, with the optimal position depending on time horizon, preferences, the asset class of the investment and reference currency. Institutional hedge ratios vary over time, and the hedging practices of large asset managers shift with risk conditions and uncertainty, influencing exchange rates. The evidence suggests that static hedging policies should be reconsidered in favour of more dynamic approaches. The remainder of this study illustrates this point by examining how some simple dynamic minimum variance hedging strategies perform compared to always hedging or never hedging.

3. Empirical methodology

This study examines how different currency hedging strategies perform across a range of asset classes and currencies. We compare two dynamic hedging approaches with the two most common static strategies: fully hedging all currency risk or not hedging at all.

We test these strategies on single-asset-class investments—such as equities, government bonds, and credit—as well as on multi-currency portfolios that combine several assets or asset classes. The analysis covers the past 25 years, the period for which we have reliable data for all relevant variables and assets.

For multi-currency portfolios, we assume each asset is equally weighted. This allows us to clearly see how each currency pair's exchange rate risk contributes to the overall risk and return of the portfolio. This approach is used for illustration only and should not be taken as a recommendation for how to construct a portfolio.

4. Case studies

To shed light on the different hedging approaches and highlight some key aspects of the results from our expanded study, we provide five case studies below. These show the different, time-varying advantages of different hedging strategies depending on the reference currencies, underlying assets and time periods involved.

When multiple currencies are present in a portfolio, some of this exchange rate risk is diversified away at the portfolio level. As a result, the individual hedge ratios for each currency may be lower than they would have been if that currency was the only one in the portfolio.

US EQUITIES FROM A CHF PERSPECTIVE

Over the sample considered, the dynamic hedge ratio of US equities for CHF-based investors varied significantly, ranging from -7% to 158% (FIGURE 1). Several important events, recessions, monetary and fiscal policy changes and crises drove those changes, together with the changing behaviour of US equity returns over the past 25+ years.

Variations in the dynamic hedge ratio can be decomposed into the correlation of the (unhedged) asset return with the currency risk premium, and the ratio of the volatility of the (unhedged) asset return to the volatility of the currency risk premium. This decomposition can provide insights into the drivers of the time variations in hedge ratios as illustrated in FIGURE 2. FIGURE 2 provides a scatter plot of the 36-month rolling window hedge ratios along contour curves that denote constant hedge ratios of different levels (-100%, -50%, 0%, 50% and 100%) for different combinations of correlations and volatility ratios.

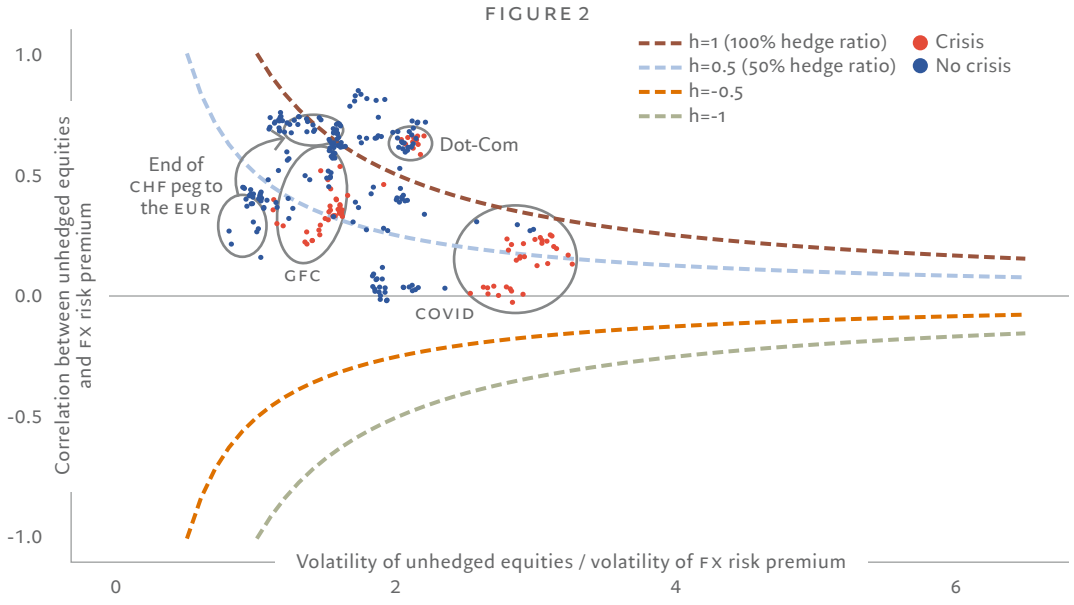
The red dots denote hedge ratios during high volatility periods, and the blue ones refer to normal times. Relative monetary policy decisions, external shocks, financial crises and fiscal or international policy changes with broader economic and financial

Minimum variance hedge ratios for US equities from a CHF perspective

FIGURE 1

Sources: Pictet Research Institute, Datastream

FIGURE 2



Sources: Pictet Research Institute, Datastream

implications play an important role in affecting the size and variation of the hedge ratio between two currencies. Asset-specific factors remain important as they determine the size of the correlation and the ratio of the volatilities in the hedge ratio. Clearly, the conventional wisdom that the volatility of the underlying asset is the sole factor of whether to hedge or not is not supported by the data and our analysis.

Depending on the case, variations in optimal currency hedging ratios can be driven by both components, or only one of them. In the case of US equities from a CHF perspective, both components are responsible for the variation in the dynamic currency hedge ratio.

The bursting of the dot-com bubble led to a weakening of the USD as the US economy entered a recession, while the CHF strengthened given its safe-haven status. That led to an increase in both the correlation of unhedged US equities with the exchange rate risk premium, as well as the respective volatilities, resulting in higher hedge ratios that exceeded 150%.

Similarly, the correlations and volatilities rose again during the early phases of the Great Financial Crisis (GFC) as the USD experienced an early weakness due to the subprime crisis, the US recession and the Fed's slashing of interest rates. The shortage of USD in the global financial system towards the end of 2008 led to an appreciation of the USD, causing the dynamic hedge ratio to fall. The steady slide was further reinforced by the global unprecedented monetary policy accommodation through rounds of quantitative easing and negative interest rates in certain countries, including in Switzerland. Those policies suppressed volatility and risk premia, reducing the need for exchange rate hedging.

The sudden appreciation of the CHF by 30% on 15 January 2015 when the Swiss National Bank removed its 1.20 ceiling against the euro led to a spike in the hedge ratio, which continued to hover around 100% until part of the Covid period.

When the Fed started to raise interest rates in 2022 to combat the pandemic-induced global inflationary shock, the USD strengthened significantly, eliminating temporarily the need for exchange rate hedging between the USD and the CHF. But as inflation in the US continued to hover above that in Switzerland, and US-imposed tariffs took centre stage, the USD weakened, increasing once again the need for hedging USD exposures for CHF-based investors.

TABLE 1 provides summary statistics for the four alternative hedging approaches, including details regarding their three major drawdowns.

We observe that the risk-adjusted returns of the different hedging strategies as captured by the Sharpe ratios improve significantly when the currency exposure is hedged over our sample period. The difference in the Sharpe ratios is minimal between the case of always hedging 100% and that of dynamically varying the hedge ratio. But this result may well be sample-specific, rather than a feature of the currencies involved. What we can safely conclude is that not hedging the exchange rate risk of US equities from a CHF perspective leads to a sub-optimal risk-adjusted performance of US equities in CHF terms, at least over the sample considered.

Across hedging strategies, the conventional approach of not hedging foreign equities performed the worst over the sample considered. Risk-adjusted returns benefit from some degree of hedging, as both dynamic minimum variance strategies and the 100% hedge strategy yield Sharpe ratios around 0.55, while that of the unhedged strategy is 0.46. In this specific case, however, adopting a dynamic strategy compared to a fixed 100% hedge strategy does not provide a material improvement in terms of risk-adjusted returns (Sharpe ratio).

TABLE 1

Panel A. US equities from a CHF perspective. Summary statistics of hedging strategies (Feb 02 – Aug 25)

	UNHEDGED			HEDGE = 100%			MINVAR			MINVAR BOUNDED		
Mean return	7.85			8.72			8.79			8.61		
Volatility	15.90			14.88			14.61			14.50		
Sharpe ratio	0.46			0.55			0.56			0.56		
Top 3 drawdowns	-50.1%	-39.3%	-21.1%	-50.9%	-26%	-25.6%	-53.2%	-23.3%	-21.2%	-50.9%	-25.6%	-21.2%
Peak dates	05/07	03/02	11/19	10/07	12/21	03/02	10/07	03/02	12/21	10/07	03/02	12/21
Trough dates	02/09	02/03	03/20	02/09	09/22	09/02	02/09	09/02	09/22	02/09	09/02	09/22
Recovery time (months)	51	44	5	42	17	15	49	13	17	47	15	17

Panel B. Minimum variance hedge ratios statistics

Average: 72%	Minimum: -7%	Maximum: 158%	Standard deviation: 41%

Mean return and volatility are in percent and annualised.
Sources: Pictet Research Institute, Datastream

Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations.

EU EQUITIES FROM A USD PERSPECTIVE

The dynamic minimum variance hedge ratio for European equities from a USD perspective remained consistently high across the entire sample, averaging 224% and never falling below 100%, as shown in FIGURE 3.

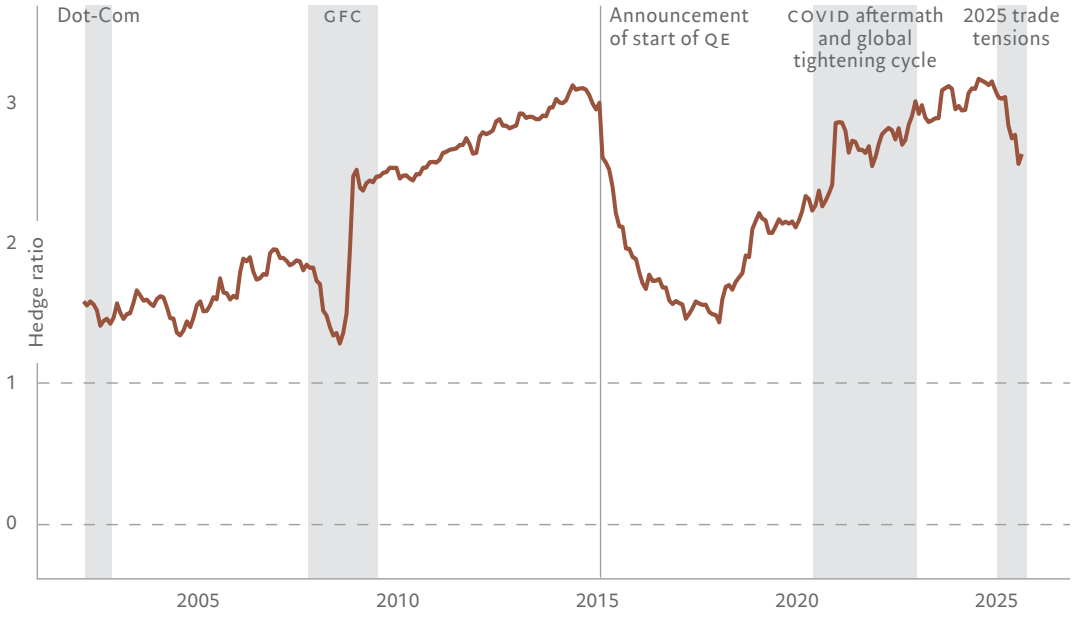
This outcome results primarily from two factors: the structurally high volatility of European equities relative to the EUR/USD risk premium, and a consistently strong positive correlation between unhedged equity returns and the currency risk premium, which ranged between 50% and 95% during most of the sample period considered.

During the early 2000s, the bursting of the dot-com bubble and the ensuing global recession initially weighed on the EUR, but as the USD weakened in the aftermath of the US recession and the Fed's aggressive rate cuts, European equities and the EUR/USD exchange rate began to move more closely in sync, pushing hedge ratios higher. The mid-2000s saw a steady rise as the European economy expanded and the EUR appreciated against the USD.

The GFC marked another turning point: European banks were heavily exposed to US subprime assets, and as credit losses mounted, European equity markets fell sharply in tandem with a steep depreciation of the EUR against the USD. Mancini et al. (2013)

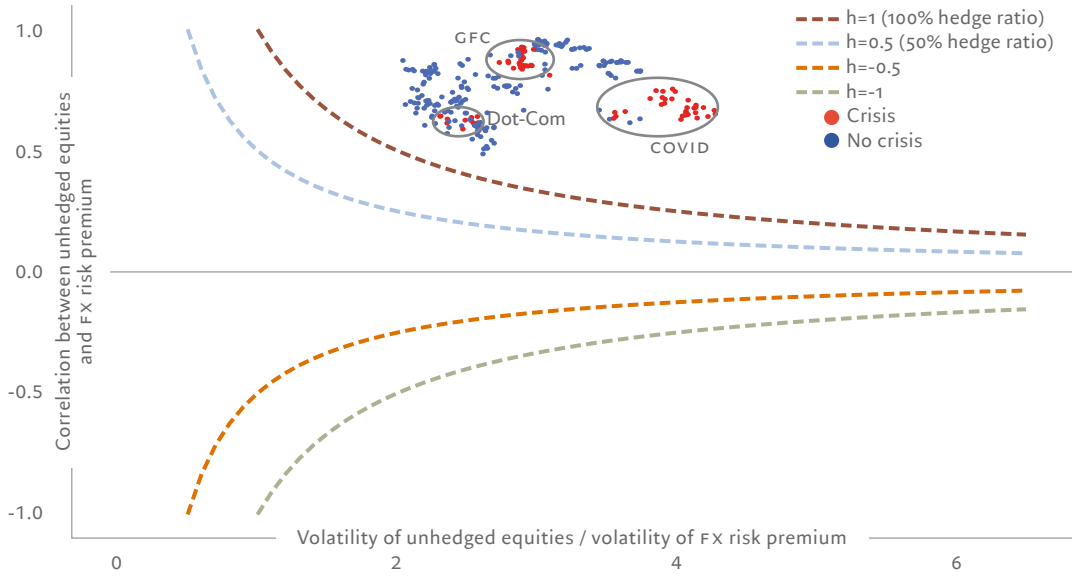
Minimum variance hedge ratios for EU equities from a USD perspective

FIGURE 3



Sources: Pictet Research Institute, Datastream

FIGURE 4



Sources: Pictet Research Institute, Datastream

document how the associated liquidity spirals in FX markets amplified the co-movement between equity and currency returns during this period, generating very high positive correlations and pushing the hedge ratio above 250%, as seen in FIGURE 4.

Notably, neither the European sovereign debt crisis (2010–2012) nor the Ukraine war and associated energy crisis (2022–2023) produced an increase in the hedge ratio, despite the significant macroeconomic turbulence that both episodes led to for European assets. In contrast, the ECB's announcement of its quantitative easing programme in 2015 was associated with a pronounced decline in the dynamic hedge ratio, as currency movements came to reflect monetary policy divergence rather than crisis-driven stress (Altavilla et al., 2015), thereby weakening the mechanical link between the FX risk premium and equity returns.

The ratio subsequently stabilised through the late 2010s, before rising again in the wake of the Covid pandemic and into the 2022 tightening cycle, reaching a peak of 316% in late 2024 as volatility and the co-movement between equities and FX increased.

Towards the end of the sample, the escalation of US trade tensions and tariff announcements in early 2025 led to a reduction in the hedge ratio, as the USD weakened, and safe-haven flows into the euro decoupled EUR/USD movements from European equity returns, reducing the correlation and mechanically lowering the hedge ratio.

In terms of performance, the case of EUR equities from a USD perspective illustrates the long-term risk-adjusted superiority of dynamic hedging (SEE TABLE 2). The unhedged strategy delivers the highest mean return (11.21%) but at the cost of dramatically higher volatility (26.79%) and the deepest drawdowns (maximum drawdown of -67.1%, with a 147-month recovery). The minimum variance strategy achieves a Sharpe ratio of 0.55, substantially higher than the unhedged (0.34) and fully hedged (0.41) alternatives, by reducing volatility to 15.93% while maintaining comparable returns. The dynamic minimum variance hedge ratio remains above 100% throughout, so the bounded minimum variance strategy coincides with the fully hedged approach in practice. The fully hedged strategy reduces drawdowns and recovery times relative to the unhedged approach, but the dynamic minimum variance approach delivers the smallest and shortest drawdowns overall. Therefore, to the extent that it is practically feasible, the recommended hedging approach remains the unbounded dynamic minimum variance hedge ratio.

These findings underscore that the optimal hedge ratio is not determined solely by the volatility of the underlying asset, but also by the evolving correlation between equity returns and currency risk premia – a relationship shaped by macroeconomic events, policy divergence and the nature of financial crises.

The results support the case for dynamic hedging strategies as they are able to adapt to the changing market conditions, unlike the static or unhedged approaches. Boudoukh et al. (2019) and Castro et al. (2025) provide independent evidence that is supportive of our findings.

TABLE 2

Panel A. EU equities from a USD perspective. Summary statistics of hedging strategies (Feb 02 – Aug 25)

	UNHEDGED			HEDGE = 100%			MINVAR			MINVAR BOUNDED		
Mean return	11.21			10.28			10.87			10.28		
Volatility	26.79			20.15			15.93			20.15		
Sharpe ratio	0.34			0.41			0.55			0.41		
Top 3 drawdowns	-67.1%	-47.1%	-25.3%	-60.2%	-32.7%	-28.0%	-56.0%	-33.5%	-23.3%	-60.2%	-32.7%	-28.0%
Peak dates	10/07	05/21	06/02	10/07	08/21	03/02	10/07	03/02	12/19	10/07	08/21	03/02
Trough dates	02/09	09/22	09/02	02/09	09/22	09/02	02/09	03/03	03/20	02/09	09/22	09/02
Recovery time (months)	147	31	7	99	10	13	67	11	8	99	10	13

Panel B. Minimum variance hedge ratios statistics

Average: 224%	Minimum: 128%	Maximum: 316%	Standard deviation: 58%

Mean return and volatility are in percent and annualised.
Sources: Pictet Research Institute, Datastream

Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations.

EU GOVERNMENT BONDS FROM A JPY PERSPECTIVE

The dynamic minimum variance hedge ratio for EU government bonds from a JPY perspective remains tightly clustered around 100% for most of the sample, averaging 99% with a standard deviation of 15% and a range of 54–138%.

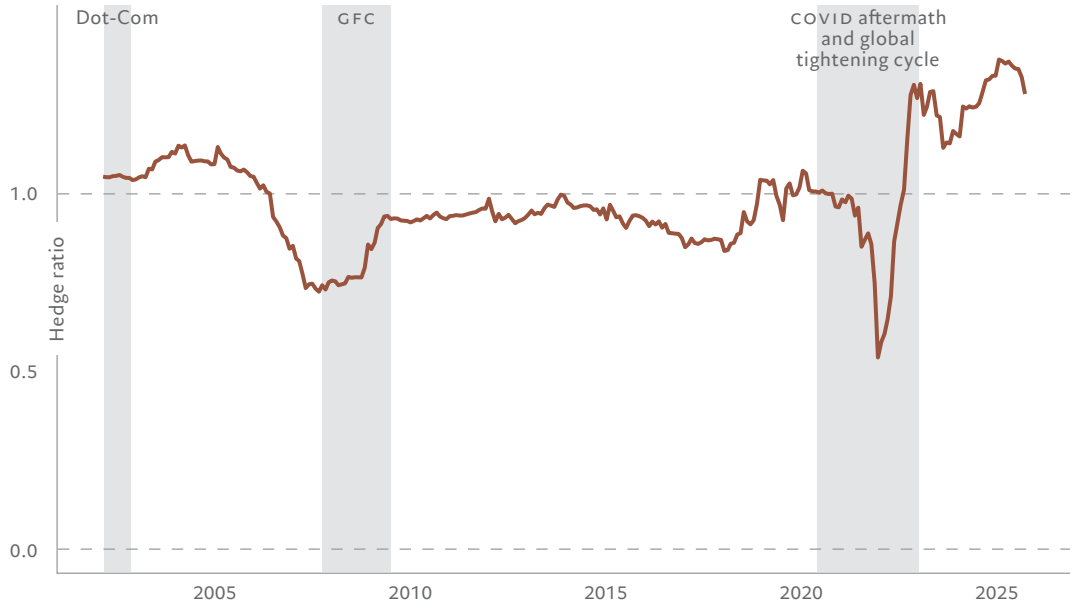
This relative stability of the dynamic hedge ratio reflects the persistently high correlation between unhedged EU bond returns and the EUR/JPY currency risk premium, as well as the relatively contained volatility ratio between asset and currency risk premium. Nevertheless, the empirical evidence here suggests a more nuanced reality, as illustrated by FIGURES 5–6.

During the early 2000s, the dot-com crisis saw the JPY benefit from its safe-haven status, with the correlation between unhedged EU bond returns and the EUR/JPY risk premium rising sharply and the hedge ratio hovering near or above 100%.

The GFC produced a modest dip in the hedge ratio as the volatility of the asset relative to the FX premium declined while the correlation remained close to 1. The unwinding of JPY carry trades during the crisis (Brunnermeier et al., 2009) led to large JPY appreciations, reinforcing the positive correlation and increasing once again the hedge ratio to closer to 100% where it stabilised during the low-rate, low-volatility environment that followed.

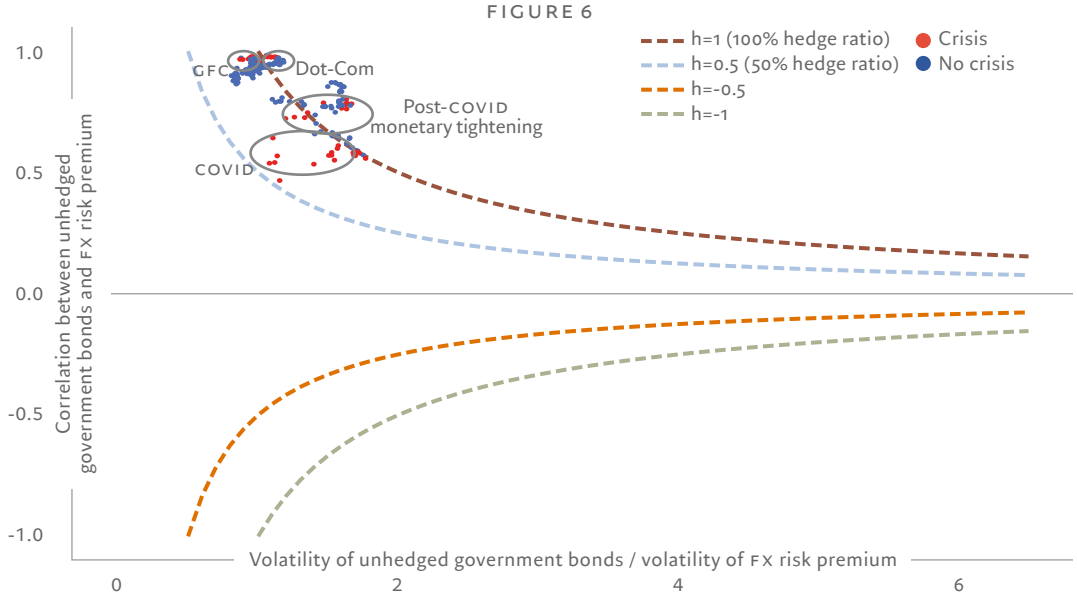
Minimum variance hedge ratios for EU government bonds from a JPY perspective

FIGURE 5



Sources: Pictet Research Institute, Datastream

FIGURE 6



Sources: Pictet Research Institute, Datastream

The most dramatic episode occurred during the 2022 global tightening cycle amidst the Covid pandemic: while major central banks tightened policy, Japan maintained ultra-loose rates, causing sharp JPY depreciation. The initial extreme JPY move produced a brief dip in the hedge ratio. However, as FX risk premium volatility remained elevated and the correlation increased, the hedge ratio quickly spiked back up and remained well above 100% through the end of our sample. While the BoJ's initial steps toward policy normalisation in 2024 temporarily lowered the hedge ratio, it remains above its historical average through the end of our sample.

While the average minimum variance hedge ratio has been close to 100% (in fact, 99%) during our sample period, the case of EU government bonds from a JPY perspective provides a challenge to the conventional recommendation to always fully hedge fixed income currency exposure, as the hedge ratio variations illustrated in FIGURES 5 AND 6 show.

The statistics presented in TABLE 3 provide yet another layer of nuance in the decision-making process of the optimal hedging strategy for this particular case. Specifically, the unhedged approach provides the best risk-adjusted outcome from a JPY perspective, with a Sharpe ratio of 0.49 compared to 0.42 for both the fully hedged and bounded minimum variance strategies, and just 0.35 for its unconstrained counterpart. The mean return of 5.93% under the unhedged strategy far exceeds the 2.0–2.4% range for all hedged alternatives, with the return penalty for hedging stemming from the cost of buying JPY forward over a prolonged period of JPY carry. While hedging reduces volatility (from 11.90% unhedged to around 5.6% hedged), the risk reduction is more than offset by the loss of the currency risk premium, which has been persistently positive due to Japan's structural low-rate environment (Lustig et al., 2014). Therefore, for investors who are prepared to withstand a higher volatility level, not hedging at all has been the superior approach during the period studied.

This analysis underscores once again the multilayered decision process regarding the optimal hedging strategy for a given currency pair and investment. The evidence here demonstrates that a blanket full-hedge approach that looks natural given the relative stability of the dynamic hedge ratio does not actually earn the best risk-adjusted returns. Hedging decisions are more complex in practice and need to be made based on a number of relevant metrics that take also into account monetary and macroeconomic factors as well as the investor's risk aversion.

TABLE 3

Panel A. EU government bonds from a JPY perspective – Summary statistics of hedging strategies (Feb 02 – Aug 25)

	UNHEDGED			HEDGE = 100%			MINVAR			MINVAR BOUNDED		
Mean return	5.93			2.40			1.99			2.43		
Volatility	11.90			5.55			5.60			5.62		
Sharpe ratio	0.49			0.42			0.35			0.42		
Top 3 drawdowns	-29.8%	-24.7%	-16.1%	-17.5%	-16.6%	-7.4%	-23.1%	-17.7%	-6.8%	-17.7%	-16.6%	-6.8%
Peak dates	07/08	03/18	11/14	03/18	12/22	08/05	12/22	03/18	08/10	03/18	12/22	08/10
Trough dates	11/11	08/19	10/16	02/19	05/25	06/08	07/25	02/19	11/11	02/19	05/25	11/11
Recovery times (months)	17	32	17	39		9		38	3	38		3

Panel B. Minimum variance hedge ratios statistics

Average: 99%	Minimum: 54%	Maximum: 138%	Standard deviation: 15%

Mean return and volatility are in percent and annualised.
Sources: Pictet Research Institute, Datastream

Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations.

JP EQUITIES FROM A USD PERSPECTIVE

The dynamic minimum variance hedge ratio for Japanese equities from a USD perspective stands out as one of the most volatile in the study, exhibiting major swings over the sample period, as seen in FIGURES 7–8.

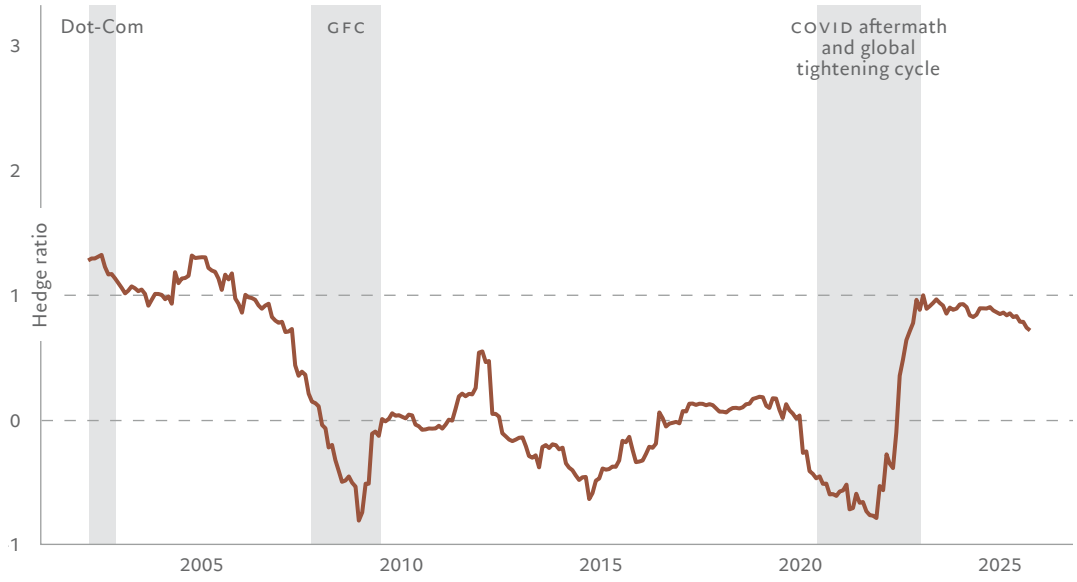
The ratio starts near 100% during the dot-com period, reflecting a positive correlation between Japanese equity returns and JPY fluctuations. It then declines through the mid-2000s before collapsing into negative territory following the GFC. This shift was driven by the JPY's safe-haven appreciation during the crisis, which cushioned USD returns and produced a negative correlation between equity returns and the USD/JPY risk premium (Ranaldo & Söderlind, 2010). The hedge ratio remains low or negative through much of the 2010s, as the yen continued to serve as a diversifier for USD-based equity investors.

The case of Japanese equities is particularly instructive because the correlation component of the hedge ratio has changed sign multiple times, as FIGURE 8 shows, driven by fundamental shifts in Japanese monetary policy and the evolving safe-haven role of the JPY (Campbell et al., 2010; Cho et al., 2020).

During the early 2000s, the BoJ's zero-interest-rate policy and the JPY's role as a funding currency for global carry trades sustained a positive

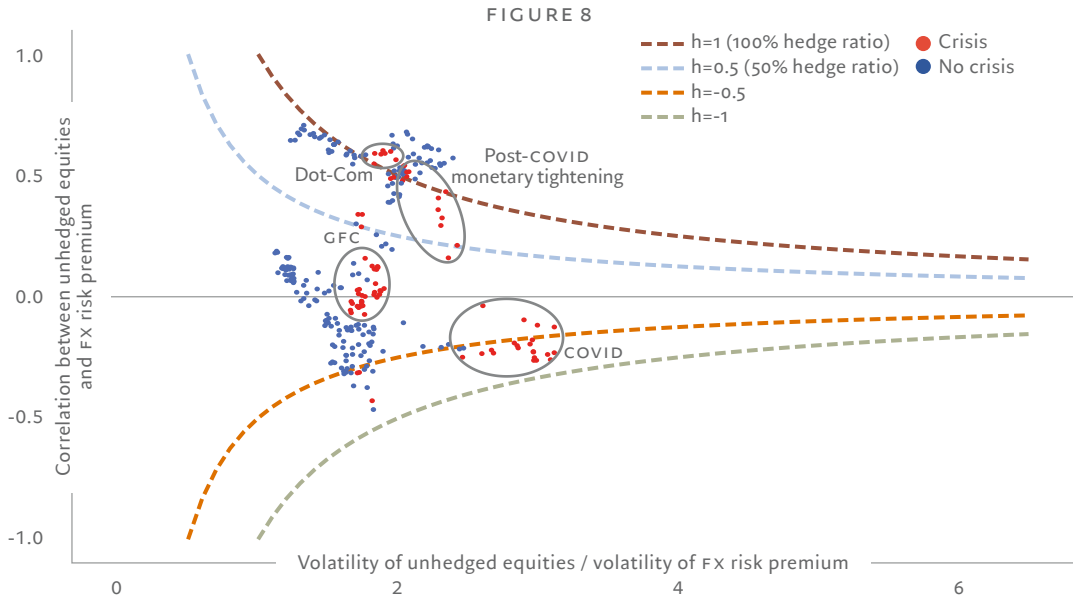
Minimum variance hedge ratios for JP equities from a USD perspective

FIGURE 7



Sources: Pictet Research Institute, Datastream

FIGURE 8



Sources: Pictet Research Institute, Datastream

correlation and hedge ratios near 100%. The GFC marked a pivotal turning point: the abrupt unwinding of the carry trade triggered a massive JPY appreciation, and Japanese equities fell alongside global markets, but the JPY strengthened, driving the hedge ratio sharply downward and into negative territory.

In the aftermath of the GFC, the hedge ratio remained depressed, hovering around zero, as the BoJ stuck to its accommodative policy and the persistent strength of the JPY kept correlations negative or near zero. There was still no lasting upward shift in the hedge ratio following the launch of Abenomics in 2013, with aggressive monetary easing and deliberate JPY devaluation (Ito, 2021), and the introduction of negative interest rates in 2016.

Around Covid, the ratio dipped further as the JPY again provided a safe-haven cushion (Cho et al., 2020). However, the post-pandemic tightening cycle saw the Fed raise rates aggressively while the BoJ remained accommodative, causing a sharp JPY depreciation. This reduced returns on Japanese equities in USD, even when local equity performance was stable, increasing the covariance between unhedged equity returns and the FX premium and pushing the hedge ratio back up towards the 100% range.

The performance analysis in TABLE 4 confirms that fully hedging investments in Japanese equities from a USD perspective is the preferred approach. The fully hedged strategy delivers the highest mean return (10.01%), compared to 8.00% unhedged, and achieves the best risk-return trade-off with a Sharpe ratio of 0.49.

The bounded minimum variance strategy achieves the lowest volatility (14.15%) and a comparable Sharpe ratio (0.48). The unconstrained minimum variance strategy adds only modest improvement to the unhedged case, reflecting its low average hedge ratio of just 26% and extreme dispersion (minimum -81%, maximum 134%, standard deviation 60%).

The bounded minimum variance strategy also limits drawdowns more consistently and achieves faster recoveries, providing a smoother cumulative return path through volatile periods. However, for all practical purposes, a strategy of fully hedging the principal exposure of Japanese equities in USD may be operationally simpler to implement.

This case exemplifies how monetary policy changes can significantly affect the optimal hedging approach at any point in time. Hedging practices should be re-examined during periods of major monetary policy shifts.

TABLE 4

Panel A. JP equities from a USD perspective. Summary statistics of hedging strategies (Feb 02 – Aug 25)

	UNHEDGED			HEDGE = 100%			MINVAR			MINVAR BOUNDED		
Mean return	8.00			10.01			8.22			8.87		
Volatility	14.69			15.98			14.44			14.15		
Sharpe ratio	0.40			0.49			0.42			0.48		
Top 3 drawdowns	-43.2%	-30.8%	-25.3%	-52.6%	-28.2%	-21.7%	-39.8%	-29.0%	-28.8%	-42.8%	-28.2%	-24.8%
Peak dates	04/06	09/21	05/02	06/07	05/02	07/15	02/07	05/02	09/21	02/07	05/02	09/21
Trough dates	02/09	09/22	03/03	02/09	03/03	06/16	02/09	03/03	09/22	02/09	03/03	09/22
Recovery times (months)	50	18	6	69	11	12	50	11	16	50	11	11

Panel B. Minimum variance hedge ratios statistics

Average: 26%	Minimum: -81%	Maximum: 134%	Standard deviation: 60%

Mean return and volatility are in percent and annualised.
Sources: Pictet Research Institute, Datastream

Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations.

GB CREDIT FROM A USD PERSPECTIVE

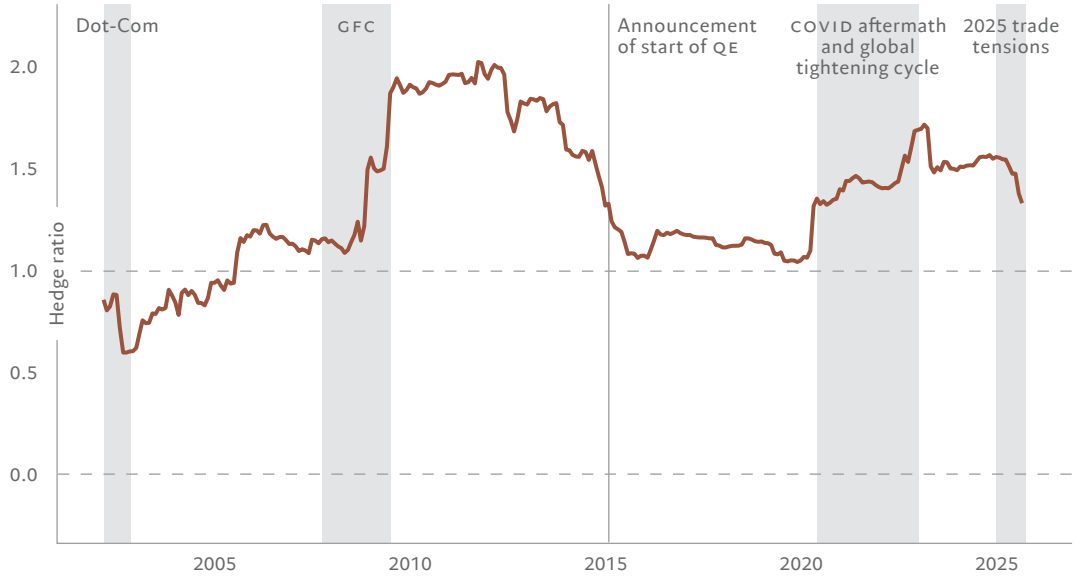
Another case worth highlighting is GB credit from a USD perspective, as it demonstrates how significant monetary policy changes and asset-specific factors (i.e. changing credit spreads) affect the variation in the optimal hedge ratio. FIGURE 9 shows that the dynamic minimum variance hedge ratio varies between 61% and 203%, with an average ratio of 135% and a standard deviation of 35%. More than the variability itself, what is important is understanding what drives it.

FIGURE 10 shows that the high hedge ratios are driven by the strong correlation between UK credit spread dynamics and GBP/USD risk premium, as well as the fact that credit-specific volatility often exceeds FX volatility. As Della Corte et al. (2023) highlight, credit spreads tend to widen during periods of economic stress, precisely when the GBP also tends to depreciate against the USD, resulting in a structurally positive and often strong correlation between unhedged credit returns and the GBP/USD risk premium.

During our sample period, the hedge ratio fluctuated around 100% during the dot-com period and rose gradually through the mid-2000s as credit spreads and GBP volatility increased. The Great Financial Crisis (GFC) led to a dramatic spike in the

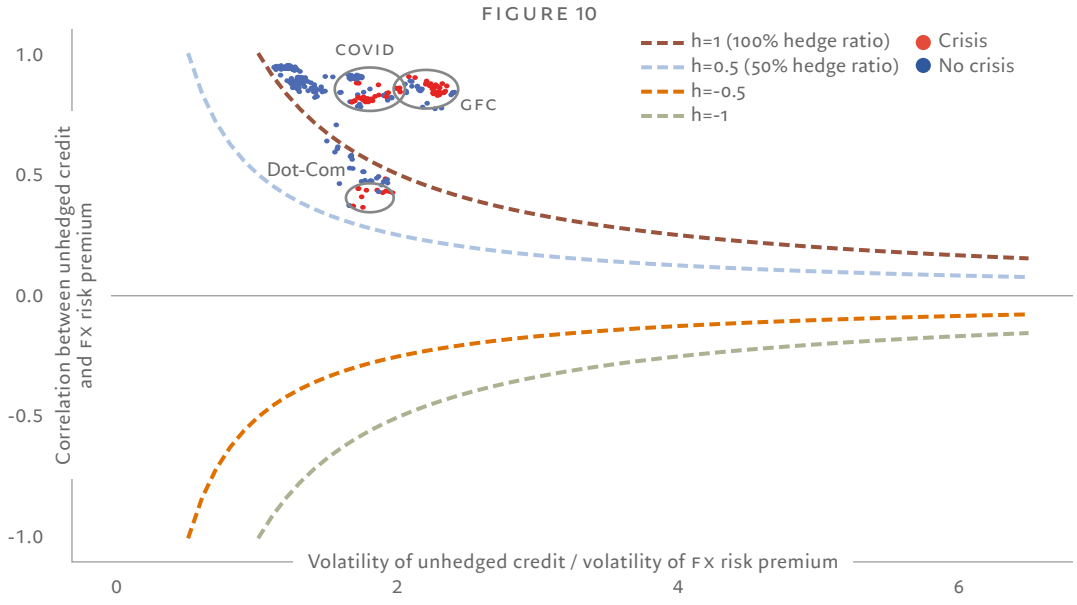
Minimum variance hedge ratios for GB credit from a USD perspective

FIGURE 9



Source: Pictet Research Institute, Chronos

FIGURE 10



Source: Pictet Research Institute, Chronos

hedge ratio as the UK banking sector was among the hardest hit globally and the GBP depreciated sharply following Bank of England's slashing of interest rates and quantitative easing. The simultaneous widening of credit spreads and GBP depreciation generated a very strong positive correlation, pushing the hedge ratio to around 175%.

With credit markets gradually normalising in the post-GFC period and volatility subsiding, the hedge ratio moved down closer but above 100%. The still elevated level reflected the persistent structural correlation between the UK credit conditions and the volatility of the GBP/USD exchange rate.

The Covid pandemic in 2020 brought about a further increase in the hedge ratio, as global risk aversion surged, UK credit spreads widened, and the GBP fell against the USD (Cho et al., 2020).

The September 2022 UK mini-budget crisis caused another mechanical jump: the GBP fell sharply, gilt yields surged and credit spreads widened, with credit volatility momentarily exceeding FX volatility and pushing the hedge ratio up before it stabilised again (Pinter, 2023). Towards the end of the sample, the escalation of US trade tensions and the April 2025 tariff announcements pushed the hedge ratio downward, as broad USD weakness rather than specific GBP depreciation drove FX movements, decoupling them from credit spread dynamics and reducing the correlation between the two.

Given the multitude of credit and monetary policy events discussed above, it is not surprising that the performance analysis in TABLE 5 confirms that the minimum variance strategy was the best hedging strategy on a risk-adjusted basis during the sample period considered. It achieved a Sharpe ratio of 0.89, well above both the unhedged position (0.53) and the fully hedged strategy (0.79), while recording the lowest volatility at 8.88% versus 15.30% unhedged. Mean returns are broadly comparable across strategies (9.77–10.20%), so the advantage of the dynamic minimum variance strategy comes almost entirely from superior risk reduction.

Since the optimal hedge ratio after 2007 has always been above 100%, fully hedging from that date onwards would be a practical choice, with the bounded minimum variance strategy ranking as the second-best strategy in terms of risk-adjusted performance. Note, however, that the drawdowns generated by the unconstrained dynamic hedging approach are shallower than in all other cases and take less time to be recovered.

TABLE 5

Panel A. GB credit from a USD perspective. Summary statistics of hedging strategies (Feb 02 – Aug 25)

	UNHEDGED			HEDGE = 100%			MINVAR			MINVAR BOUNDED		
Mean return	10.20			9.77			9.98			10.04		
Volatility	15.30			9.72			8.88			9.74		
Sharpe ratio	0.53			0.79			0.89			0.81		
Top 3 drawdowns	-49.2%	-34.0%	-19.7%	-29.6%	-16.8%	-16.6%	-24.9%	-15.5%	-13.5%	-29.6%	-16.6%	-15.5%
Peak dates	10/07	05/21	01/20	05/07	04/02	09/21	05/07	04/02	01/20	05/07	09/21	04/02
Trough dates	12/08	09/22	03/20	11/08	10/02	09/22	11/08	10/02	03/20	11/08	09/22	10/02
Recovery times (months)	10	23	8	8	6	14	7	6	8	8	14	6

Panel B. Minimum variance hedge ratios statistics

Average: 135%	Minimum: 61%	Maximum: 203%	Standard deviation: 35%

Mean return and volatility are in percent and annualised.
Source: Pictet Research Institute, Chronos

Past performance should not be taken as a guide to or guarantee of future performance. Performances and returns may increase or decrease as a result of currency fluctuations.

5. Main findings

In what follows, we summarise the results of our expanded study that includes our findings across the four hedging approaches considered for equities, government bonds, credit and multi-asset portfolios denominated in Swiss franc, US dollar, euro, Japanese yen and British pound and viewed from the perspective of investors in each of these currencies. Given the volume of the results, we summarise them based on a single descriptive measure which is the Sharpe ratio – a measure of risk-adjusted returns. While the previous case studies discussed show that at times it is instructive to consider several metrics to evaluate alternative hedging approaches, in the plurality of cases, the Sharpe ratio is an adequate metric. To conserve space, we will discuss the remainder of our results based on that.

Note that the results of this study are contingent on our sample and are not intended to provide an automatic playbook or manual for practitioners to pick the "optimal" hedging strategy no matter what the conditions. Instead, our analysis highlights a key takeaway: rigid, one-size-fits-all rules are best avoided. The most effective approach to currency hedging is a flexible one, tailored to the prevailing conditions and case at hand. More than anything, our analysis highlights the considerations that are important for choosing a currency hedging approach at each point in time and what could prompt variations in it.

EQUITIES (JAN 1999–AUG 2025)

Conventional wisdom and widespread industry practices suggest that equities denominated in a currency other than the investor's reference currency do not need to be hedged because the exchange rate risk accounts for only a relatively small part of their total risk. As previous sections highlighted though, this recommendation stems from the old and now debunked notion that exchange rate fluctuations contribute only risk to an investment and no return. We now know that this is not the case.

Our summary results in TABLE 6 show that hedging currency risk in equities is highly beneficial for the risk-adjusted performance of equity investments not denominated in the reference currency. In general, dynamic currency hedging appears to be the preferred approach. This is not surprising, given that UIP does not hold and currency risk premia are time-varying.

The local currency of the investment does matter, however. Our results reveal one exception that cannot be dismissed as sample specific. We find that Swiss equities need not be hedged regardless of whether the investor's reference currency is the USD, EUR, JPY or GBP. MinVar and no hedge strategies yield Sharpe ratios that are almost equal for Swiss equity investments from a EUR and GBP perspective. The ultra safe-haven nature of the CHF, which tends to appreciate often more than other safe-haven currencies during times of crises or heightened market volatility, implies that hedging does not improve risk-adjusted performance.

TABLE 6
Strategies with the highest Sharpe ratio for equity investments

INVESTOR CURRENCY	INVESTMENT CURRENCY				
	CHF	USD	EUR	JPY	GBP
CHF		MinVar	MinVar	MinVar	MinVar
USD	No Hedge		MinVar	Hedge 100%	MinVar
EUR	MinVar	MinVar		MinVar	MinVar
JPY	No Hedge	No Hedge	No Hedge		No Hedge
GBP	No Hedge	MinVar	MinVar	MinVar	

GOVERNMENT BONDS (JAN 1999–AUG 2025)

As expected, our results suggest that exchange rate risk in government bonds should be hedged, often at 100% of the principal investment, as shown in TABLE 7 for the sample period considered. One exception is Japanese investors investing in bonds in USD, EUR, GBP and CHF. The reason has to do with the general weakness of the JPY relative to the other currencies considered here for much of the period studied, making this result sample period-specific.

In particular, Japan's lost decade and the Asian crisis led to a depreciation of the JPY against the USD and other major currencies in the late 1990s. This depreciation stabilised in the 2000s prior to the financial crisis of 2008, with the JPY relatively stable and only moderately weak. This is when carry trades proved profitable, with traders often borrowing in JPY to invest in higher yielding currencies. In the post-GFC period of 2008-2012, the JPY became a safe haven due to Japan's status as a major creditor nation.

The arrival of Abenomics in 2013 led to a reversal of JPY's strength with strategic depreciations that lasted until 2020. The Covid pandemic-induced inflation episode in 2020 led most major central banks to raise interest rates and tighten monetary policy. In contrast, the Bank of Japan maintained its loose monetary policy leading to a major relative depreciation of the JPY against other major currencies. As a result, the JPY has declined in value against the other currencies in our study, making it unnecessary for Japanese investors to hedge the exchange rate risk from EUR, CHF and GBP government bonds.

The summary results for both equities and government bonds highlight that the currencies involved are crucially important in exchange rate hedging decisions. The safe-haven status (or not) of a currency influences the choice of the hedging approach, as does the type of investment to be hedged. The latter is important because as discussed earlier, the correlation of the unhedged asset return with the currency risk premium, and the ratio of the volatilities of the unhedged asset return and the currency risk premium determine the size of the hedge ratio. Different assets exhibit different correlations with the currency risk premium and have different volatility ratios, resulting therefore in different optimal hedging strategies.

TABLE 7

Strategies with the highest Sharpe ratio for government bond investments

INVESTOR CURRENCY	INVESTMENT CURRENCY				
	CHF	USD	EUR	JPY	GBP
CHF		Hedge 100%	Hedge 100%	MinVar	Hedge 100%
USD	Hedge 100%		MinVar	MinVar	No Hedge
EUR	MinVar	Hedge 100%		Hedge 100%	MinVar
JPY	No Hedge	MinVar	No Hedge		No Hedge
GBP	Hedge 100%	Hedge 100%	MinVar	Hedge 100%	

CREDIT (JAN 1999–AUG 2025)

It is generally recommended to hedge the currency exposure in credit investments, as shown in TABLE 8, at least for the exchange rates considered in our sample. A dynamic hedging approach seems to dominate most cases, with Japanese credit being the case where hedging ratios are more often closer to 100% than not. Again, this is related to the depreciation of the JPY during most of the time covered by our study, confirming that relative monetary policy and macro factors can play a significant role in exchange rate hedging decisions.

TABLE 8
Strategies with the highest Sharpe ratio for credit investments

INVESTOR CURRENCY	INVESTMENT CURRENCY				
	CHF	USD	EUR	JPY	GBP
CHF		MinVar	MinVar	Hedge 100%	MinVar
USD	Hedge 100%		MinVar	MinVar	MinVar
EUR	MinVar	MinVar		Hedge 100%	MinVar
JPY	MinVar	MinVar	MinVar		MinVar
GBP	MinVar	MinVar	MinVar	Hedge 100%	

MULTI-CURRENCY AND MULTI-ASSET PORTFOLIOS (JAN 1999–AUG 2025)

Dynamic hedging is the preferred strategy when a portfolio is invested in assets denominated in multiple currencies, as is the case in TABLE 9. Note that as the exchange rate risk premia in the cases considered are not independent of each other, when multiple currencies are present in a portfolio, some of this exchange rate risk is diversified away at the portfolio level. As a result, the individual hedge ratios for each currency may be lower than they would have been if that currency was the only one in the portfolio. This in turn implies that fully hedging each asset prior to including it in the portfolio will likely lead to unnecessary excess hedging that could detract from performance. Instead, the decision of whether to hedge a currency should be an integral part of portfolio construction.

TABLE 9
Strategies with the highest Sharpe ratio for multi-currency and multi-asset investments

INVESTOR CURRENCY	INVESTMENT CURRENCY			
	EQUITIES	GOVT BONDS	CREDIT	EQUITY & GOVT BONDS
CHF	MinVar	MinVar	MinVar	MinVar
USD	MinVar	MinVar	MinVar	MinVar
EUR	MinVar	MinVar	MinVar	MinVar
JPY	MinVar	MinVar	MinVar	MinVar
GBP	MinVar	MinVar	MinVar	MinVar

6. Conclusions

This study provides an in-depth analysis of currency hedging strategies across major currencies, asset classes, and portfolio types from 1999 to 2025. We compare both static hedging approaches—fully hedged or unhedged—with dynamic, minimum-variance strategies, assessing their impact on portfolio risk and performance. The results are bound to be largely specific to the period studied and are not intended as blanket recommendations to be followed blindly in the future. Instead, the goal is to highlight the drivers of changes in the optimal hedging policies and alert the reader to considerations one needs to keep in mind in managing exchange rate risk in global portfolios.

Our analysis simulates portfolios invested in equities, government bonds, high-yield bonds, and diversified combinations. We look at average returns, volatility, risk characteristics, and drawdowns from the perspective of five key reference currencies: Swiss franc, US dollar, euro, sterling, and yen.

There is no universal answer to currency hedging. The best hedge ratio depends on the investor's reference currency, the currency of the underlying assets, the asset class, and market conditions.

The main takeaway is clear: there is no universal answer to currency hedging. The best hedge ratio depends on the investor's reference currency, the currency of the underlying assets, the asset class, and market conditions. In most cases, dynamic hedging strategies outperform static rules, but the optimal approach varies across currency pairs, portfolios and macro developments.

For Swiss franc investors, hedging foreign currency exposure generally improves risk-adjusted returns, especially in government bonds and credit, where full

hedging is usually optimal. In equities, minimum-variance hedging can add value, but the resulting hedge ratios are volatile, making a static full hedge a more practical choice, given the franc's safe-haven status.

US dollar-based investors face more mixed results. The benefits of equity hedging depend on the investment currency, while for bonds, the strong link between unhedged returns and currency risk premia usually favours hedging. However, unhedged positions can outperform when volatility rises. For multi-currency portfolios, minimum-variance hedging offers a balanced approach.

[Our] results challenge the conventional wisdom of static hedging rules—such as "0% for equities, 100% for bonds"

Euro-based investors typically benefit from dynamic hedging in equities and credit, while full hedging is preferable for government bonds. In multi-currency portfolios, dynamic strategies make the most of currency relationships and enhance performance.

For yen-based investors, staying unhedged in equities and government bonds almost always delivers the highest risk-adjusted returns, despite higher volatility. In high-yield bonds and diversified portfolios, dynamic hedging can help reduce drawdowns without sacrificing returns.

Sterling investors find that dynamic currency exposure pays off in equities—except for Swiss stocks, where hedging offers little benefit. Dynamic hedging also improves the risk-return profile in credit, while full hedging is usually best for government bonds, except for euro-denominated bonds, where a dynamic approach can be advantageous. At the portfolio level, minimum-variance strategies tend to outperform static rules, echoing the findings for yen investors.

Overall, these results challenge the conventional wisdom of static hedging rules—such as "0% for equities, 100% for bonds"—which may work in some cases but fall short across different currencies, asset classes and time

periods. The optimal hedge ratio is highly dependent on the reference currency and changes over time. In some cases, such as for yen-based investors, hedging can actually reduce risk-adjusted returns, highlighting the need for active management.

Our analysis across different volatility regimes shows that currency risk affects both volatility and expected return, with its impact shifting across currencies and over time. Crisis periods do not fundamentally change this dynamic but do amplify the importance of factors like safe-haven status and currency risk premia.

In summary, our findings support treating currency hedging as a core part of portfolio construction and asset allocation—not just a tool for reducing volatility. Effective currency management requires a flexible, data-driven approach that recognises the diversity of currencies and assets.

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