

Understanding Portfolio Insurance Management (CPPI/TIPP)

July 2024



Constant Proportion Portfolio Insurance (CPPI) strategy, also known as portfolio insurance or “cushion management” strategy, is an investment approach designed to safeguard the initial capital invested at a specific maturity date while also providing the potential for additional returns based on market performance. In this case, the investment is made upfront, the protection is provided at the end, and the potential bonus is conditional on market performance.

While CPPI aims to provide protection at maturity, Time-Invariant Portfolio Protection (TIPP) seeks continuous protection throughout the investment period. The management methodology behind this strategy is similar to CPPI. TIPP offers ongoing protection, covering less than 100% of the invested capital throughout its duration.

The value of investments may fall as well as rise and you may not get back the full amount invested.

How does it work?

Portfolio insurance involves splitting a portfolio between a low-risk asset and a more volatile portion invested in a high-risk asset. The protection goal aims to be accomplished by continuously adjusting the allocation between high-risk and low-risk assets. The exposure to the high-risk asset varies based on market conditions and past performance, often referred to as “path-dependent” characteristics. Given its trend-following feature, this strategy seeks to increase exposure to the high-risk asset in rising markets and decrease it in falling markets, aiming to generate returns while protecting the capital.

This dynamic approach requires detailed and precise daily monitoring, although rebalancing may not necessarily occur every day. Portfolio insurance relies on three key components:

1 | The floor or “bond floor”

This represents the minimum value of the investment required to secure the capital at maturity (for CPPI) or at all times (for TIPP). In CPPI, it is calculated as the present value of the guaranteed amount at maturity, discounted at the current market interest rate. The floor works like a liability, with a single payment due at product’s maturity, and its value decreases with longer maturities and higher interest rates. In TIPP, the floor is simply the level of protection of the strategy.

2 | The cushion

This refers to the portion of the investment’s value that can be lost without compromising the capital protection. It is the difference between the total value of the investment and the floor.

3 | The multiplier

This variable determines how much of the portfolio is invested in the high-risk asset. The multiplier is used to calculate the exposure to the high-risk asset by multiplying it with the cushion. The multiplier’s level is defined asset class by asset class. The solution provider or guarantor sets a multiplier based on the maximum estimated overnight loss of the high-risk asset. The maximum multiplier is the inverse of the maximum acceptable overnight stress (i.e. a Gap Event) that can be borne by the high-risk asset while seeking to ensure capital protection. Assuming that the high-risk asset will not suffer an overnight decline greater than 20%, the multiplier would be 5 (5 corresponding to 1/20%).

Multipliers are generally determined sub asset class by sub asset class (for example, the multiplier for emerging equities is lower than that for US large cap equities), and the multiplier level itself is often variable, depending on the volatility of the sub asset class.

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Illustration of average indicative multipliers by high level asset class

Asset Class	Indicative Overnight Stress	Indicative Multiplier
Equities	Between -25% and -16.7%	Between 4 (ie 1/25%) and 6
Fixed Income	10%	10
Commodities	20%	5
High Yield	14.30%	7
Real Estate	25%	4

Source : AXA IM as of July 2024. The multiplier values provided are for illustrative purposes only.

Main parameters impacting a portfolio insurance strategy

Parameter	Impact	Exposure to high-risk asset
Interest rate	CPPI: The higher, the lower the floor, hence the higher the cushion TIPP: No impact	CPPI: The higher the better TIPP: No impact
Maturity	CPPI: The longer, the lower the floor TIPP: No impact	CPPI: The longer the better TIPP: No impact
Multiplier		The higher the better
High-risk asset	The higher the risk and volatility, the lower the multiplier	The lower the risk, the higher the exposure

Ratchet Mechanism

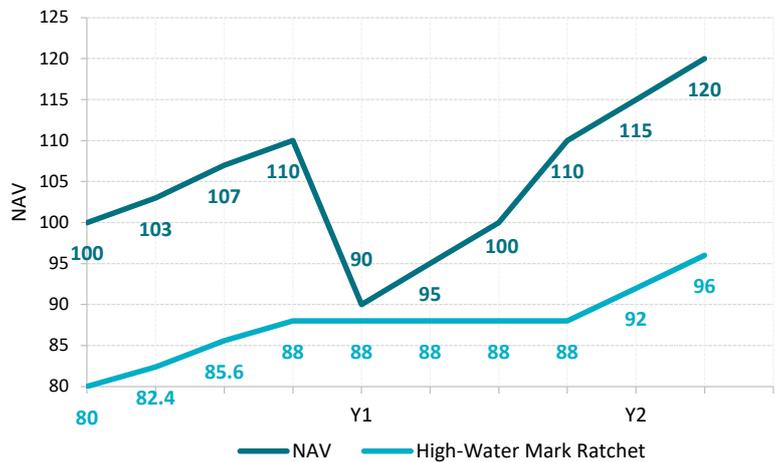
The range of **protection mechanisms offered is broad** and extends beyond simply the goal of protecting the invested capital. Some products aim to protect a specific return at maturity, rather than just the initial capital, or offer performance linked to market path over time. In such cases, an **intermediate protection** mechanism, known as a **“ratchet option”**, aims to **lock in returns** achieved.

A key feature of this dynamic approach is indeed the ability to “lock in” gains generated throughout the investment horizon. For instance, some ratchet mechanisms are designed to secure 60% or 90% of the portfolio’s highest performance over its lifespan, with the most conservative products offering up to 100%. This ratchet mechanism protects not only the invested capital, but also a portion of the gains realized during the investment period.

Ratchet Mechanism	Definition	Example	For which type of investors	Impact on the exposure
High Water Mark Ratchet (HWM) known as “MaxNAV” ratchet Daily, quarterly, yearly ...	This ratchet mechanism aims to secure a percentage of the portfolio’s highest value by safeguarding a portion of the peak performance, ensuring the investor receives a revised minimum return, even if the market experiences a downturn afterward.	If a product protects 80% of the highest portfolio value achieved during its lifespan, that evolving protection becomes the new floor, aiming to ensure the investor receives at least 80% of the peak performance, even if the market declines after the peak is reached.	For open ended products invested by the most conservative clients.	Generally, reduces the exposure to the high-risk asset over time. Another option is to combine the mechanisms, such as resetting the HWM ratchet.
Step Ratchet Continuously or at a set frequency	The floor is periodically adjusted based on portfolio performance, allowing for gradual increases in the minimum return over time. While less common, this approach offers a schedule for floor potential upward adjustments.	If the portfolio increases by 10%, the product might lock in 50% of that gain, thus a 5% gain is protected moving forward.	For conservative clients.	Aims to limit the exposure when performances are locked-in, but also aims to provide a good smoothing effect when the market decreases.
Resettable Ratchet (for TIPP only) Typically reset annually	A mechanism that seeks to adjust the protection (and so the floor) either upward or downward on a specified anniversary date.	On each anniversary date (annual reset), the floor for the year to come is adjusted upward or downward compared to the previous annual floor depending on the portfolio’s performance over the previous year.	When the primary goal is to have a high participation to the high-risk asset performance, with the protection being a secondary objective to limit major market drawdowns only.	Limits the impact of path dependency: even in the event of a market collapse, the potential cash event (investment in cash only) would be temporary, and the product will be exposed after the ratchet.

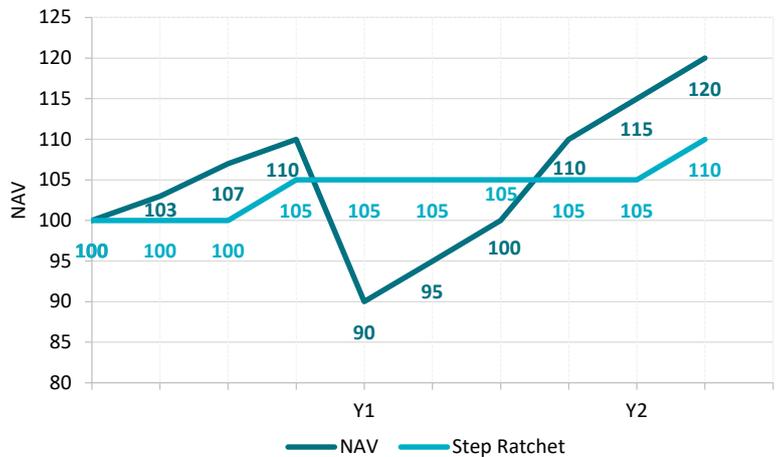
High-Water Mark Ratchet or MaxNAV ratchet¹

The high-water mark ratchet refers to a mechanism that aims to enable the protection level to increase with the highest historical Net Asset Value (NAV). This means that if the portfolio value reaches a new high, the protection level will be adjusted upwards based on this new high-water mark (80% of the HWM in this example). This mechanism aims to provide a safeguard against market downturns while allowing potential gains to be «locked in» as the portfolio value increases. Conversely, when the NAV decreases, the ratchet remains locked and is not adjusted downwards.



Step Ratchet¹

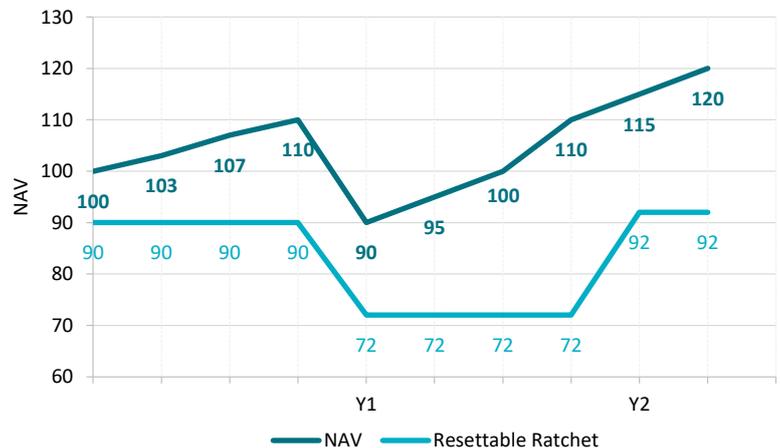
The step ratchet is a mechanism that aims to adjust the protection level at predefined return intervals or “steps”. This means that the protection level remains constant until the Net Asset Value reaches a predefined positive performance step (+10% in this example), at which point the protection level is adjusted upwards to a new step level (For each +10% in NAV performance, 50% of that performance is secured). The step ratchet offers a method for periodically enhancing the level of protection as the NAV increases, offering a balance between safeguarding against market downturns and potential gains as the NAV rises.



Resettable Ratchet¹

“Resettable ratchet” refers to a mechanism where the protection level is adjusted at a specific frequency, usually yearly. At the end of each year, the protection level is reset based on the NAV at that date. This approach provides the opportunity to adapt the protection level at a specific frequency (80% yearly reset in this example) allowing for a more responsive approach to changes in the NAV performance over time.

The value of investments may fall as well as rise and you may not get back the full amount invested.



¹ Source : AXA IM as of 30th July 2024. For illustrative purposes

A protection objective accomplished through daily rebalancing

The management objective of these strategies is achieved through **daily rebalancing**, ensuring capital preservation while maximising gains from rising markets: they follow a disciplined approach. However, the theoretical rebalancing mechanism follows a “buy after market rallies and sell after market declines” behaviour (known as the **Negative Gamma effect or trend following effect**). We look to consistently enhance our portfolio management by **adding a discretionary layer**: the “quantamental” approach.

Our active decision-making process consists in deciding whether or not we set the exposure at its maximum level, meaning potentially de-risking the portfolio beyond what the algorithm would recommend and / or adjust the timing. We believe this approach helps to counterbalance the trend-following behaviour of CPPI/TIPP.

For some specific products, especially those tailored for long-term investments such as retirement solutions, it is a key factor in order to offer flexibility.

“To go further”: Formal guarantee versus objective of protection

Three types of protection can be provided, ranging **from the most robust one (Formal Guarantee) to an objective of protection only**. It does not affect the way the products are managed.

Formal guarantee provided by an investment bank:

- The formal guarantee or formal protection shields investors from risks such as drastic declines in the high-risk asset **beyond the gap initially considered** in the calibration of the multiplier, and a default in the low-risk asset. This is achieved by entering an Over The Counter (OTC) derivatives instrument (gap swap) and a **“guarantee agreement”** with the same counterparty.
- This highly secured type of guarantee imposes constraints on the assets used and associated costs.

This conservative **formal** feature is mandatory in certain jurisdictions to allow the **use of the term “guarantee” or “protection”**.

Objective of protection with a gap swap:

This is achieved by entering a gap swap (OTC instrument) only. As such, it generally **safeguards investors only from risks associated** with significant and abrupt declines in **the high-risk asset**, but not from a default of the low-risk asset. The embedded costs are generally lower than those incurred with the formal guarantee feature above.

This category of protection is generally required by **institutional clients** to have a recognition of a real protection (including in **Solvency II regulation**).

Objective of protection:

The objective of protection is achieved through the dynamic rebalancing of the portfolio on its own (with no additional gap swap instrument nor guaranteed agreement on top). This implies that under certain severe market conditions (such as a gap risk event, being a daily drop higher than the maximum acceptable loss initially considered), the objective of protection may not be met.

The growth participation with this last category is generally higher than with the two other protection categories, as there are no additional costs and fewer constraints on the high-risk asset. It fills some demands for investors considering protection as a secondary objective.

At AXA IM we are used to managing all types of guarantee from formal guarantee to objective of protection, and can share our insights on structuring depending on specific needs.

Advanced portfolio insurance solutions

Max NAV Put TIPP – an alternative to standard TIPP with a Max NAV ratchet

Max NAV Put TIPP is an innovative option-based protection mechanism (formula) which combines:

- The continuous protection benefits of TIPP: the increase of the daily protection with max NAV ratchet (with a high water mark feature),
- Without the risk of being cash-locked over a medium-term investment horizon (3 to 5 years)

The Max NAV Put TIPP is an option-based strategy whereby a put option is purchased. The put option valuation is assessed using a recursive approach: the put payoff references the strategy NAV, while the strategy NAV itself depends on the prevailing put option price.

Individualised CPPI (iCPPI) :

It designs a set of **customised strategy for each client** covering features such as the high-risk asset constituents, protection characteristics such as level and ratchet type, maturity, etc. iCPPIs are designed to address the specific needs of each end-saver. Furthermore, each client can modify the features of his tailored product over time.

Implementing an iCPPI framework presents **technological challenges** for distributors, resulting in higher costs, which explains the limited number of offerings. AXA IM has assisted insurance companies in delivering these offers by managing and structuring the underlying CPPI.

Why subscribe into CPPI/TIPP: an attractive strategy to meet a range of needs

For retail clients:

The key advantage of this strategy is the peace of mind it aims to provide for conservative investors who have a risk averse approach to financial markets. End-savers are offered the opportunity to benefit from equity market gains while their investments are designed to protect against market downturns.

For institutional investors:

These strategies, when including a formal guarantee or at least a gap swap, provide two key advantages:

- It effectively limits potential losses for the company, as an **explicit protection** is embedded in the product, and
- It lowers capital requirements for insurance companies under Solvency II regulation.

For UK Defined Contribution Plans during accumulation and decumulation phases:

The portfolio insurance management techniques seek to safeguard the pension pot, especially as individuals approach and enter retirement, when preserving accumulated wealth is essential. This ensures that savers are shielded from significant losses at the beginning of their retirement, **addressing the sequencing risk**.

By automatically adjusting the asset allocation based on market conditions, these techniques provide **more stable returns and a reduced portfolio volatility** that retired clients are often looking for. Moreover, with the management handled by the asset manager, individuals are relieved from the decision-making burden, which is often influenced by emotional biases. As a result, these techniques aim to promote a more stable and thoughtful approach to long-term investing.

How does AXA IM's approach to portfolio insurance management stand out?

AXA IM's **approach** to portfolio insurance combines a systematic investment strategy with the active management of the high-risk asset exposure through a "quantamental management". This includes interest rate hedging, use of derivatives and other techniques to manage the high-risk asset on top of the CPPI, which aims to reduce the trigger event risk. By managing these strategies for a broad spectrum of investors, we believe we maintain a client-focused viewpoint and provide tailored solutions aligned with specific investment objectives.

Risks and limitations

Interest rates risk – only for CPPI

Rebalancing the CPPI portfolio may also be necessary in response to changes in interest rates, as they can affect the floor level over time if this risk is not hedged. A decrease in interest rates will increase the present value of the guarantee offered at maturity. This, in turn, reduces the cushion and negatively impacts the maximum exposure to the high-risk asset.

To limit this risk and reduce the negative impacts of declining interest rates on the cushion, we can decide to hedge this risk. There are two possible approaches:

- Static hedging at the product's inception, or
- Dynamic hedging by adjusting the hedging amount, instruments used and the timing.

At AXA IM, depending on market conditions (including liquidity), the currency of the portfolio, the maturity of the CPPI and the definition of the bond floor, we optimise the hedging strategy by choosing or combining three hedging strategies:

- Entering long Receiver Swaps positions, which aim to lock in the interest rate used for discounting the product protection at maturity. The market value of the swaps indeed increases when long-term interest rates decrease and aims to make the cushion not sensitive to any interest rate move. The cushion would however not benefit from an increase in interest rates,
- Entering long Receiver Swaptions positions, which provide a floor to the interest rate applied for discounting the protection at maturity while still allowing the maximum exposure to the high-risk asset to benefit from rising interest rates,
- Buying the bonds that match the bond floor definition (the amount bought would depend on the composition of the fund, if a funded or unfunded high-risk asset).

These strategies can be combined and adjusted through time, depending on our market forecast.

Volatility of the high-risk asset

Both CPPI and TIPP involve adjusting the allocation between high-risk (growth) and low-risk (protective) assets based on market conditions. During periods of high volatility, the value of the high-risk asset fluctuates significantly, requiring more frequent rebalancing to maintain the desired level of capital protection. This high frequency trading activity is detrimental to the performance, because of the negative gamma effect.

At AXA IM, we use various methods to aim to minimise this risk:

- Managing dynamically the algorithm rebalancing: an active discretionary management of the high-risk asset exposure (lower exposure than the maximum one calculated systematically, based on our forecasts), thus reducing the frequency of rebalancings,
- Incorporating a volatility mechanism into the multiplier's definition, thereby considering market potential turbulence before exposing the portfolio, and
- Applying a volatility cap or volatility target strategy to the high-risk asset to smooth the high-risk asset returns and then decrease the number of rebalancings.

These techniques can be combined for an optimal efficiency.

Severe drawdown of the high-risk asset performance

The main risk is the occurrence of a sharp decrease in the performance of the high-risk asset. This may compel the portfolio manager to drastically reduce the allocation to the high-risk asset to meet the protection, and potentially lead to a “cash out event” or “trigger event”. In the case of CPPI products, this specific event can also be triggered by a large decrease in interest rates if this risk is not hedged (cf section above “interest rates risk – only for CPPI”).

In such scenarios, the portfolio loses its “growth” exposure either until maturity (CPPI) or temporarily (TIPP). Without growth exposure, the portfolio’s future performance would come solely from the low-risk asset, explaining the term of a “cash locked” product. The asset of the portfolio would indeed be fully invested in the bond floor, awaiting maturity to benefit from the protection for CPPI, and in money market instruments for a long period for TIPP (the time to bring the cushion back to viable level when the performance of money market instruments is higher than the total expense ratio of the TIPP).

At AXA IM, to reduce the likelihood of a product “cashing out”, we implement additional measures. This includes actively managing the interest rate sensitivity of the cushion, adjusting exposure using our “quantamental” approach and applying volatility cap features to the high-risk asset. Additionally, we may allocate a small portion of the cushion to the purchase of a long-dated call option on the high-risk asset, ensuring ongoing participation in market growth regardless of prevailing market conditions once the product is launched.



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