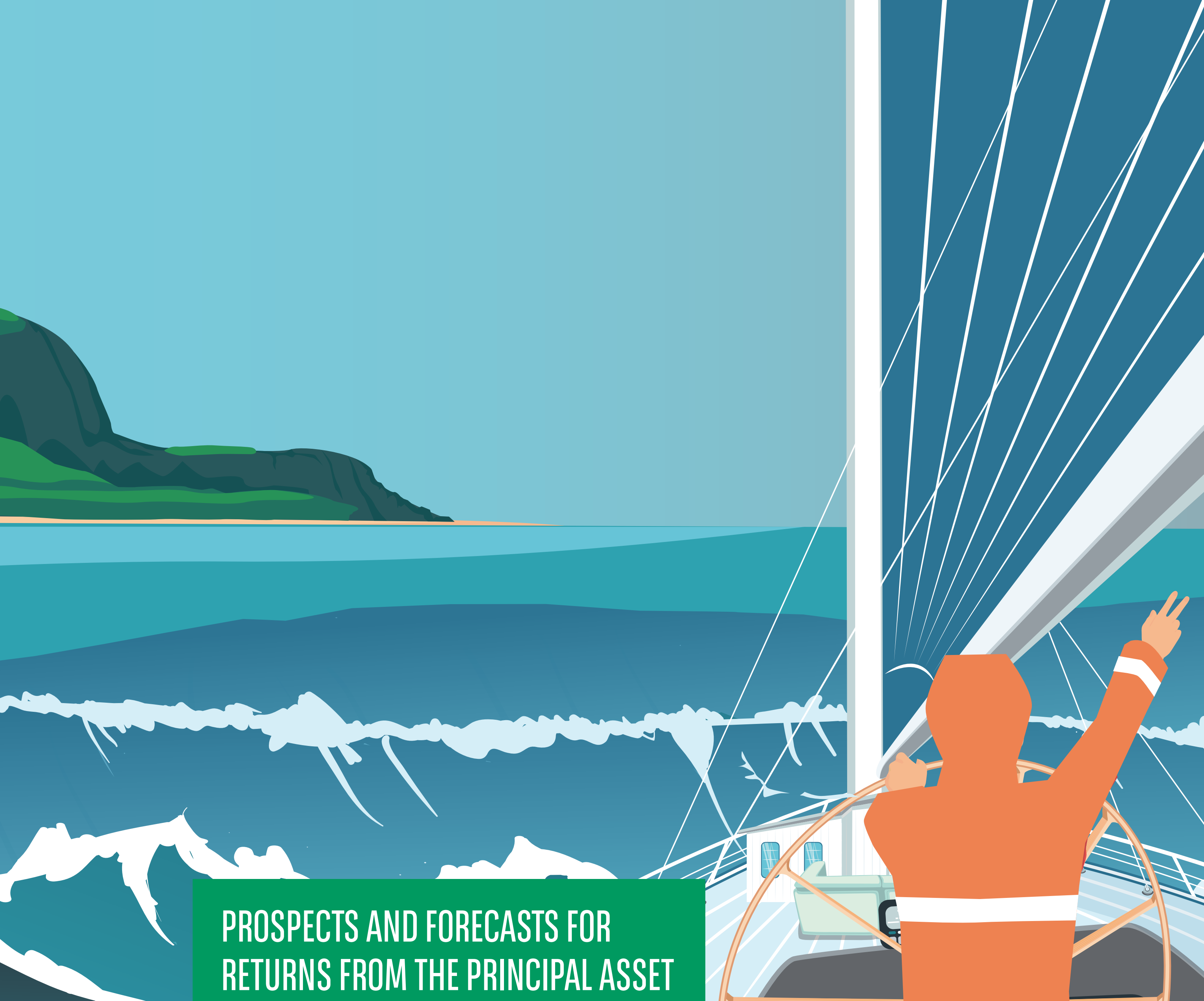
For professional investors - August 2025

LONG-TERM ASSET ALLOCATION

THE GREAT DISRUPTION?



PROSPECTS AND FORECASTS FOR RETURNS FROM THE PRINCIPAL ASSET CLASSES OVER THE NEXT 5 YEARS

BNP PARIBAS ASSET MANAGEMENT

The sustainable investor for a changing world

Koye Somefun

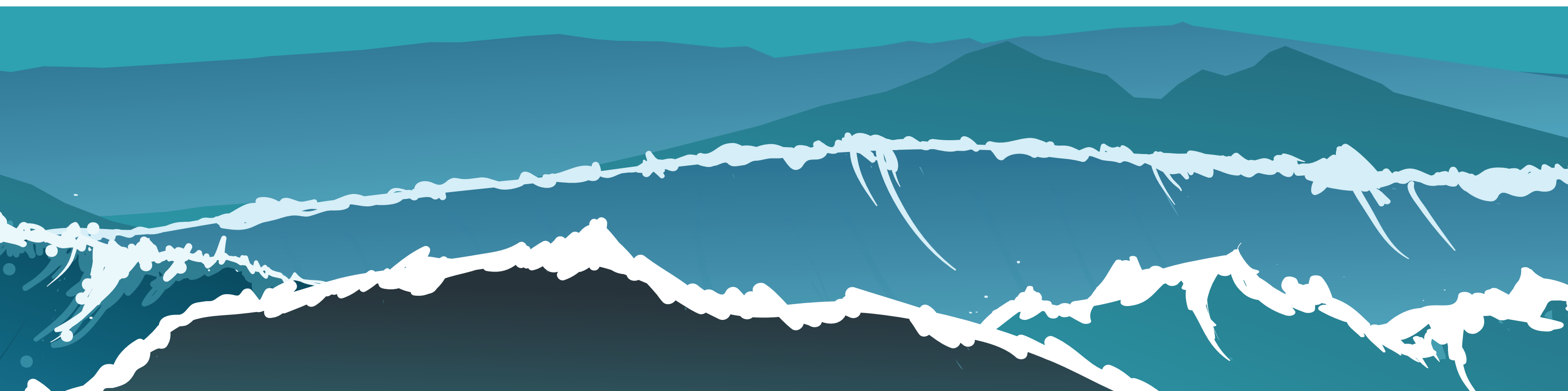
Head of Multi Asset & Solutions
Quantitative Research Group
koye.somefun@bnpparibas.com

Daniel Morris

Chief Market Strategist
daniel.m.morris@bnpparibas.com

Mehdi-Vincent Hacini

Quantitative Analyst,
Quantitative Research Group
mehdivincent.hacini@bnpparibas.com



- Our base case scenario is that the economic environment will again 'normalise' over the coming years and we will revert back to a situation of under-consumption and under-investment, pushing inflation back to central bank target levels (US and UK) or lower (Japan and eurozone). Demographic headwinds will likely make meeting inflation targets an uphill battle for all central banks.

- Our expectations for risk-adjusted returns for a euro-based investor over the next 10 years are modest. We see few of the major asset classes with a Sharpe ratio greater than 0.5.

- Within core assets, we are more positive on credit and rates than equity; within government bonds, we are more positive on nominal bonds than inflation-linked bonds.

- We are most negative on the risk-adjusted return of US equity. Based on our valuation metric, US equities are still quite expensive.

THE GREAT DISRUPTION?

How much has changed for long-term investors with Donald Trump's re-election as US president? The new administration is remaking the global trading system as well as disrupting much of post-war international relations. Europe has agreed to a significant increase in defence spending, while the economic models of much of the rest of the world are being called into question.

The challenge for investors is to assess to what degree these changes will impact medium-run economic growth and inflation rates – and thus asset performance.

Growth

One of the objectives of the Trump administration is to raise the US economy's growth rate. It hopes to do this through deregulation, a growth-oriented corporate tax regime, and increased domestic investment incentivised by tariffs. Factors which will offset the positive impulse include a smaller labour market due to a reduction in illegal immigration, and higher input costs for companies (at least in the short term) due to tariffs.

Economists appear to be unconvinced. Consensus estimates for 2027 GDP growth have been steady at 2% for the last six months.

By contrast, export dependent regions like Europe could see their already low growth rates drop further as tariffs crimp corporate profits. Exports account for 50% of eurozone GDP compared to just 11% for the US (which also explains why the US administration's tariff policies have met such little resistance. The disparity in export shares gives the US a significant amount of leverage as Europe needs the US market much more than vice versa).

Europe is looking to offset the drag from tariffs by increasing investment, notably in defence and infrastructure (Germany). While this effort should boost growth, the benefits may be partly offset through higher interest rates as the additional spending will be at least partly funded by debt issuance. Germany also faces labour market constraints (Fachkräftemangel), despite high levels of immigration. Arguably the greatest constraint on the region's growth remains regulation, but is not clear there is a desire among its inhabitants to meaningfully reduce them.

As for China, overcapacity (both in manufacturing and in property) and newly limited export markets (not just the US but also Europe), may force the government to finally develop the social safety net (welfare, health and unemployment insurance), that will enable its inhabitants to lower savings rates and increase consumption.

Interest rates and inflation

Tariffs will lead to (temporarily) higher inflation in the US and perhaps more persistently lower inflation in the eurozone (exacerbated by increased Chinese imports). Long-run inflation expectations for both regions, however, are basically unchanged since the US election.

A more significant impact could be seen if the replacement for Federal Reserve Chairman Jerome Powell is more inclined to keep policy rates lower than necessary to meet the Fed's inflation target (or even proposes changing the target itself). In fact, market estimates of the long-run level of the fed funds rate has been rising, but merely in line with the trend that existed before the election as forecasts normalise from the Covid shock.

A similar pattern can be seen in the Treasury term premium. It has been noted that this measure of the risk of holding US government bonds is at its highest level in 10 years. While true, it has been rising ever since the Fed started its Quantitative Tightening programme. This was always expected to lead to higher term premium as QT simply reversed the impact of QE (whose objective was to lower the term premium). From the low in the summer of 2022, the term premium increased by 4bp a month on average through the US election. Since then, the increase has been 5bp, and it has fallen recently even as President Trump hardened his rhetoric towards Fed Chair Powell and fired the head of the Bureau of Labor Statistics (BLS).

One might conclude then that for all the volatility and disruption unleashed by the new US administration, the factors driving long-run economic growth and inflation (demographics, productivity) predominate. As for us, our model assumes the same long-run (i.e., steady-state) growth and inflation rates as in previous iterations.

> One might conclude that the 'great disruption' of the Trump Administration will not meaningfully impact long-run growth and inflation trends.

RECOMMENDATIONS

Our expectations for risk-adjusted returns for a euro-based investor over the next 10 years are relatively modest. Few of the assets shown in Exhibit 1 have a Sharpe ratio greater than 0.5. Within core assets, we are more positive on credit and rates than on equity; within government bonds, we are more positive on nominal bonds than inflation-linked bonds. Finally, we are most negative on the risk-adjusted return of US equities.

In the appendix (Exhibit 21) you will find a table with expected returns and risks across a broad range of assets and different long-term investment horizons.

Private assets offer the potential to further diversify the risks in an investment portfolio; they exploit the 'illiquidity premium' as they require a long-term commitment of capital. One should be cautious, however, about making simple like-for-like comparisons with public markets as private markets have highly specific characteristics.

Exhibit 1: Asset allocation recommendations

*Sharpe ratios for a 10-year investment horizon and euro-based investor**

BONDS

BONDS		
0.5		
Sovereign	Investment Grade Corp	High Yield Corp
0.5	0.51	0.41
Euro Sovereign	Euro Inflation-linked	
0.52	0.41	
High yield	EMD USD Sovereign	EMD LC Sovereign
0.41	0.32	0.33

EQUITY

EQUITY			
0.24			
US	Europe	Japan	Emerging
0.17	0.32	0.39	0.4
Equity	Listed Real Estate		
0.24	0.32		

*Hedging curency returns except for local currency emerging market debt and equity (in USD).
Source: BNP Paribas Asset Management, June 2025

INCOPORATING RECOMMENDATIONS INTO A STRATEGIC ALLOCATION

To translate the above recommendations into actionable portfolio recommendations one might directly use an optimiser However, this approach has its limitations--- it's not scalable when dealing with various portfolio constraints or objectives across different investors. Additionally, it fails to provide guidance on how clients can adjust their long-term asset allocations to align with these opportunities within their personal risk tolerance.

Rather than relying on such methods, which lack scalability, we propose a structured two-step approach:[1]

1 Issaoui, T., Perchet, R., Retière, O., Soupé, F. and Yin, C., 2020, R. Leote de Carvalho. Mass Customization of Asset Allocation. Journal of Investing April 2022, 31 (3) 73-97.

Step 1: Generate an unconstrained long-short portfolio based on the difference between the long-term (equilibrium) and 10-year risk and return numbers (presented in this document).

Step 2: Use the implied active returns derived from the unconstrained long-short portfolio in step 1 to construct the tailored portfolios with investor-specific constraints and targets using robust portfolio optimisation.

This approach produces portfolios consistent with the views while complying with clients' constraints. Moreover, it facilitates a detailed performance breakdown: distinguishing between the client's long-term asset allocation, the unconstrained portfolio and the impact of client-specific constraints.

Let's illustrate this performance breakdown of the unconstrained portfolio. Starting from the beginning of 2022--- when we had the last major model review --- and using the risk and return numbers we have on record up to the end of Q2 2025, this 'hypothetical' unconstrained portfolio would have generated an excess over cash of 2.2% with a realized volatility of 1.3%. The unconstrained portfolio contains overweight and underweight positions for more than 25 assets that are updated each quarter. Exhibit 2 details this performance. After neutralizing the return contribution for underlying common risk drivers such as market risk, duration and corporate spread, the performance attribution of the asset specific risk is positive for all major asset classes with a significant contribution coming from government bonds, inflation linked and Real Estate.

Exhibit 2: Return of hypothetical long-short portfolio from beginning of 2022*.

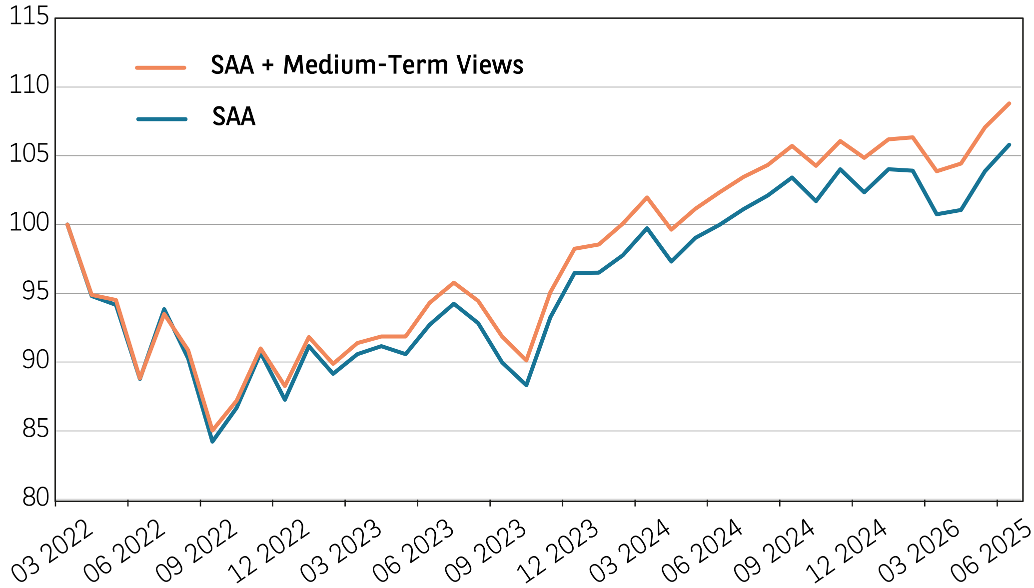
		Excess Return	Realized Volatility	Realized SR
Risk Factors	Market Risk	0.1%	0.2%	0.6
	Duration	0.2%	0.4%	0.4
	EM & Commodities	0.0%	0.2%	0.2
	Corporate spreads	0.1%	0.3%	0.5
	US	0.0%	0.2%	0.1
	Asia & China	0.1%	0.2%	0.7
Specific Risk	Equity	0.2%	0.7%	0.3
	Sovereign	0.4%	0.4%	1
	Inflation Linked	0.2%	0.3%	0.8
	Investment Grade	0.1%	0.3%	0.5
	High Yield	0.1%	0.2%	0.5
	Leveraged Loans	0.1%	0.2%	0.6
	Bond EMD	0.1%	0.2%	0.6
	Real Estate	0.2%	0.3%	0.7
	Commodity	0.0%	0.0%	0.3
Factors		0.6%	0.6%	1
Specific		1.6%	1.0%	1.6
Total		**2.2%**	**1.2%**	**1.8**

*Shows the hypothetical euro hedged excess return of the unconstrained long-short portfolio ignorng trading costs. Realised volatility and Sharp Ratio (SR) do not add up due to correlation effects.

Source: BNP Paribas Asset Management, June 2025

This unconstrained portfolio is hypothetical as it ignores typical implementation constraints such as no outright short positions and the investment universe being restricted to the universe of the underlying long-term asset allocation. However, the impact of these two restrictions is very modest for a relatively traditional balanced portfolio with allocations to EUR sovereign, global credits and global equity. Excess return drops from 2.2% to 1.8% with realised volatility unchanged at 1.3%. The return of the portfolio starts to lag more significantly if we introduce the additional constraint of being fully invested without leverage. The excess return then drops to 0.8% with realised volatility a touch lower at 1.2%. Exhibit 3 illustrates the added value of this more restricted implementation.

Exhibit 3: Performance of long-term asset allocation (SAA) with and without medium-term tilts. The tilts constraints are the universe of the underlying SAA, no short position and fully invested without leverage



Source: BNP Paribas Asset Management, June 2025

The unconstrained long-short portfolio based on the difference between long-term and 10-year risk and return numbers assumes hedging of the currency exposure. If a client cannot hedge their currency exposures, then most of the excess returns could evaporate due to the implicit currency exposure that follows from the tilts, for example long Japanese Equity, if not hedged, also implies a long position on the Japanese yen which would have been detrimental to the overall performance.

This two-step approach provides a robust and scalable way to implement portfolio recommendations based on medium-term valuation dislocations (discussed in this document). Moreover, it also facilitates greater explainability of the final portfolio performance by allowing for an easy split between the performance coming from the long-term strategic asset allocation and the medium-term portfolio recommendations. Finally, the performance of the latter can be further broken down by showing the impact of various portfolio constraints vis-à-vis the unconstrained portfolio.

GOVERNMENT BONDS

For many of our clients, assets and liabilities both play a key role in their strategic asset allocation decisions. Liabilities are client-specific and therefore typically do not resemble the cash flow pattern of any standard bond index. To incorporate these liabilities into an asset allocation requires a view of the entire yield curve so that the present value and sensitivities to interest rates and inflation shocks of any liability pattern can be calculated. In other words, we must create a 'customised bond index' that closely mimics the interest-rate sensitivities of a client's liabilities and corresponding matching assets. This approach has the additional benefit of being able to deal with a customised bond index of an asset-only client. Focusing on the term-structure of interest rates provides flexibility in terms of customising our expected returns for fixed-income assets.

More flexibility comes at the price of increased complexity, however. To keep complexity to a minimum, we use a parsimonious yield curve model that only needs a limited number of input parameters to generate the yield curve. A key input for this approach is the 10-year yield.

Exhibit 4 gives the expected equilibrium inflation, 10-year nominal and real yield for different currencies. At the moment inflation is still a touch above the target level of most central banks, albeit decelerating. Our base case scenario is that the economic environment will again 'normalise' over the coming years and we will revert back to a situation of under-consumption and under-investment, pushing inflation back to central bank target levels (US and UK) or lower (Japan and eurozone). However, we expect this convergence to take longer due to the uncertainty around tariffs; moreover, demographic headwinds will likely make this an uphill battle for all central banks.

The target 10-year real yield is simply the difference between the 10-year nominal yield and inflation. The lower growth potential in Japan and the eurozone, partly due to ageing populations, in combination with expected under-investment and consumption due to excess savings will likely result, in equilibrium, in small negative real yields for these two regions.

Exhibit 4: Equilibrium expectations nominal and real 10-year yield plus equilibrium inflation assumptions.
The 10-year real yield is obtained by subtracting inflation from the nominal yield.

	USD	EUR Core	GBP	JPY
10Y Nominal	2.8%	1.3%	2.7%	0.9%
Inflation	2.3%	1.8%	2.0%	1.0%
10Y Real Yield	0.6%	-0.4%	0.7%	-0.1%

Source: BNP Paribas Asset Management, June 2025

Our framework requires a view on how 10-year nominal and real yields (for inflation-linked bonds) converge from current levels to equilibrium levels. We then use BNPP AM's proprietary Monte Carlo (MC) simulation framework to transform the expected convergence path of the (nominal and real) yields into expected return and risk figures.

Exhibit 5 gives the resulting expected returns for the various investment horizons. Our base case scenario is that monetary policy will continue to ease over the coming years, after which yield curves will converge back to lower equilibrium levels. However current uncertainty around tariffs might at least initially slow down the convergence as central bankers need to assess the impact of tariffs on inflation and growth. For government bonds and cash this means that for all investment horizons expected returns lie above equilibrium levels. The dislocation for cash is especially high as the current short end of the yield curves lies significantly above the equilibrium rate for all major regions.

Exhibit 5: Average expected total return for nominal government bonds and cash in local currency over various horizons

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Bond EUR Sovereign Core	3.7%	3.3%	2.5%	1.7%
Bond EUR Sovereign	4.4%	4.0%	3.1%	2.1%
Bond USD Sovereign	5.5%	4.6%	3.8%	3.0%
Bond GBP Sovereign	7.1%	5.7%	4.5%	3.3%
Bond JPY Sovereign	2.7%	2.5%	2.0%	1.4%
Cash EUR	1.5%	1.2%	0.9%	0.6%
Cash USD	3.4%	2.7%	2.3%	1.9%
Cash GBP	3.0%	2.5%	2.2%	1.8%

Source: BNP Paribas Asset Management, June 2025

INFLATION-LINKED BONDS

Expected returns of inflation-linked government bonds (in local currency) are detailed in Exhibit 6. Equilibrium returns are slightly higher than nominal bonds for the US and the UK. In the UK, this is mainly caused by the significantly longer maturity of UK inflation-linked bonds.

In the US, inflation-linked bonds are significantly more risky than nominal bonds (consequently pushing up the arithmetic mean in our MC simulation framework used to transform the expected convergence paths of the nominal and real yields into expected return and risk figures).

It is the Sharpe ratio which determines the allocation, and, in equilibrium, it is marginally lower for inflation-linked bonds than for comparable nominal bonds. This is something you would expect as inflation-linked bonds neutralise part of the inflation risk.

For euro, GBP and US dollar-denominated inflation-linked bonds, the expected returns for the different investment horizons are higher than the equilibrium returns. This is caused by higher current inflation and a real yield curve that is expected to decrease from its current levels, having a positive effect on the price of the current bond portfolio (positive duration effect).

Exhibit 6: Average expected total return for inflation-linked bonds in local currency over various horizons

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Bond EUR Inflation Linked	4.4%	3.6%	2.7%	1.7%
Bond USD Inflation Linked	7.0%	5.6%	4.5%	3.4%
Bond GBP Inflation Linked	5.5%	5.3%	4.5%	3.6%

Source: BNP Paribas Asset Management, June 2025

INVESTMENT-GRADE CREDIT AND HIGH YIELD

The modelling approach taken for credit distinguishes between the duration and credit risk components. The return from the duration component simply mirrors the corresponding government bond return. The cash flow pattern of the credit index in combination with the corresponding government bond term-structure is used to calculate the expected return and risk coming from the duration exposure.

Separately, the credit model determines the expected spread return (and risk). Total expected return is simply the sum of the expected return on exposure to duration and credit risk. This is a slight simplification as these components are not exactly linearly separable. However, it typically provides a good approximation and leads to a more intuitive understanding of the build-up of credit returns.

To determine the spread return, current spreads, equilibrium spreads and the probabilities of rating migrations play a key role. For corporate bonds, we believe a focus on default probabilities is too narrow. Especially for investment-grade corporate bonds, a rating downgrade is a bigger risk. Investors often refer to this as the risk of an issuer becoming a 'fallen angel'. To take this into account, we include Moody's long-term and forecast rating migration matrices in our approach.

Exhibit 7 shows the average transition matrix for a global corporate bond portfolio from 1920-2022. The rows represent the rating at which a particular corporate issue starts the year; the columns represent the rating at which the issue ends the year. The numbers in the table represent the probability of transitioning from the 'row-state' to the 'column-state'.

For example, the matrix tells us there is a 7.4% probability of any given Aaa bond being downgraded to Aa within a year. Consequently, the expected return in any given month on a 10-year AAA bond (for example) is given by combining the yield (or roll-down) effect and the risk of ratings transition or default.

Exhibit 7: Average one-year ahead rating migration rates 1920-2024

From\To	Aaa	Aa	A	Baa	Ba	B	Caa	Ca_C	WR	Def
Aaa	87.2%	7.4%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%	4.4%	0.0%
Aa	1.0%	84.8%	7.5%	0.7%	0.2%	0.0%	0.0%	0.0%	5.9%	0.1%
A	0.1%	2.6%	86.1%	5.1%	0.5%	0.1%	0.0%	0.0%	5.4%	0.1%
Baa	0.0%	0.2%	3.8%	84.4%	4.0%	0.6%	0.1%	0.0%	6.6%	0.2%
Ba	0.0%	0.1%	0.4%	5.9%	74.9%	6.6%	0.7%	0.1%	10.3%	1.1%
B	0.0%	0.0%	0.1%	0.5%	5.5%	72.4%	6.3%	0.4%	11.6%	3.0%
Caa	0.0%	0.0%	0.0%	0.1%	0.3%	5.7%	70.9%	3.0%	13.3%	6.6%
Ca_C	0.0%	0.0%	0.1%	0.1%	0.4%	2.3%	10.0%	45.5%	13.6%	28.1%

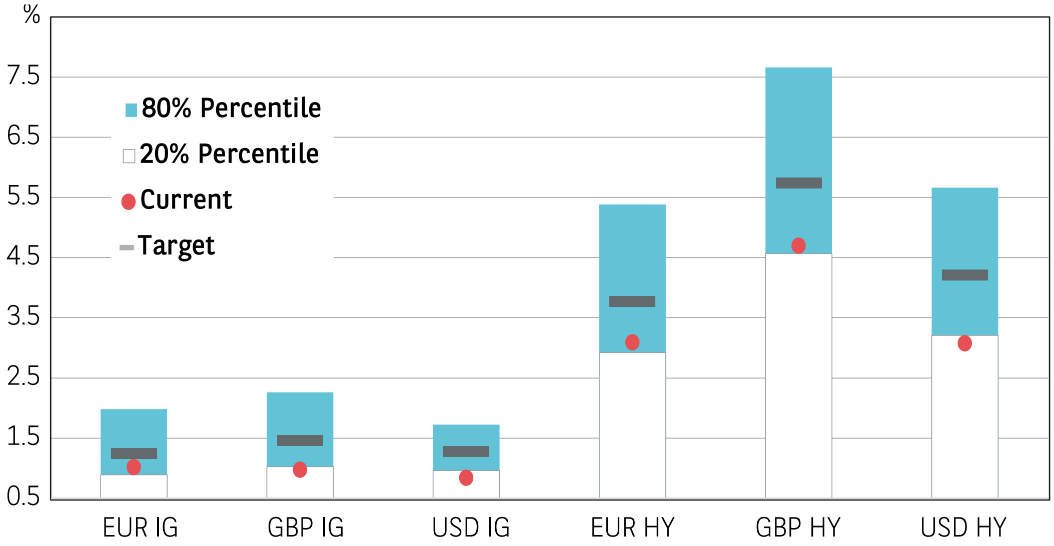
Source: Moody's 2024

To calculate the yield (or roll-down) effect requires for each region a consideration of the underlying credit curves. For all these credit curves, we construct a current and equilibrium curve in a similar way to the one we constructed for government bonds. The current spread curve moves in future years to the equilibrium curve. As an anchor point of each equilibrium spread curve, we use the median spread for each rating since February 2003. We take the 7-year point as the reference for Investment Grade ratings and the 4-year point for High-Yield ratings.

Exhibit 8 shows the current spread and equilibrium spreads for the target durations. A complicating factor is the rating migration. For example, an AA-rated bond today will not necessarily be an AA-rated bond tomorrow due to default, downgrade or upgrade. Therefore, we use Moody's current one-year-ahead migration matrix and long-run migration matrix to assess the impact of defaults and rating migrations. In year one, we start with the current one-year-ahead migration matrix and converge in a linear fashion in 10 years to the long-run migration matrix, using from the tenth year onwards the long-run migration matrix.

> 66 A complicating factor is the rating migration. An AA-rated bond today will not necessarily be an AA-rated bond tomorrow due to default, downgrade or upgrade.

Exhibit 8: Current & long-term target spreads – Q2 2025—assuming fixed weights to underlying letter rating buckets to facilitate inter period comparison



Source: Bloomberg and BNP Paribas Asset Management, June 2025

Exhibits 9 and 10 show the total return in local currency, and the excess return over local cash of credit over various investment horizons for the standard Bloomberg Barclays Aggregate corporate indices.

For all regions expectations lie above the equilibrium numbers. This is mainly because of higher expectations for the underlying government bonds. The absolute returns for the US and the UK are significantly higher than for their eurozone counterparts. These differences are partly driven by the underlying local cash rates (as can be seen from the numbers in excess over local cash in Exhibit 10). In excess return (and for hedged return) terms, we have a regional preference for UK credit partly due to higher absolute spread levels for the UK (leading to a larger spread contraction) and higher expectations for the underlying government bonds (over local cash).

Exhibit 9: Expected total return in local currency of developed market credit over various horizons.

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Bond GBP Investment Grade	6.8%	6.0%	5.2%	4.2%
Bond GBP High Yield	6.8%	6.5%	6.1%	6.0%
Bond EUR Investment Grade	4.0%	3.7%	3.1%	2.5%
Bond EUR High Yield	4.7%	4.4%	3.9%	3.8%
Bond USD Investment Grade	6.4%	5.8%	5.1%	4.3%
Bond USD High Yield	5.9%	5.6%	5.2%	5.1%

Source: BNP Paribas Asset Management, June 2025

Exhibit 10: Expected excess return in local currency of developed credit over various horizons

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Bond GBP Investment Grade	3.6%	3.4%	3.0%	2.3%
Bond GBP High Yield	3.6%	3.9%	3.8%	4.1%
Bond EUR Investment Grade	2.4%	2.5%	2.2%	1.9%
Bond EUR High Yield	3.1%	3.2%	3.0%	3.2%
Bond USD Investment Grade	2.9%	2.9%	2.7%	2.3%
Bond USD High Yield	2.4%	2.8%	2.8%	3.1%

Source: BNP Paribas Asset Management, June 2025

EMERGING MARKET DEBT

For emerging market debt (EMD) we distinguish between emerging market corporate and sovereign debt. Sovereign and supranational debt is comprised of hard currency (HC) and local currency (LC) sovereign global bonds. Hard currency emerging market debt is denominated in foreign currencies, predominantly in US dollars, but with denomination in euros being more common for Eastern European countries.

Typically, a country can default on its hard currency debt whereas for local currencies a credit event is generally channelled through a strong depreciation/devaluation of the currency (as a country can typically print more money to pay for its debts in local currencies).

Emerging market debt – hard currency

As with credit, the expected return for EMD HC consists of a US Treasury or underlying yield and a spread component. Partly due to the limited availability of data, we opt for a more stylised approach than the curve approach used for developed credit by estimating the historical relationship between the spread over US treasuries for EMD HC and key explanatory variables: (expected) GDP growth, the average rating for the EMD HC index, and the weighted average US corporate debt spread.

Exhibit 12 illustrates the historical fit of this relationship. The actual spread and the modelled spread show a closer relationship between 2010 and 2020. We believe the recent history is most representative of the future as emerging markets have become more mature and intertwined with the global economy (this view assumes the impact of the current deglobalisation trend and the impact of tariffs will be limited). The simple spread model, derived from this relationship, allows for the calculation of target spreads conditional on the expected value of the three explanatory variables.

This target spread changes during the first 10 years as the three explanatory variables change. After 10 years, the spread represents the equilibrium spread and does not change further as the explanatory variables are static. The current actual spread typically differs from this target spread.

We assume that this difference between target spread and actual spread disappears in a linear fashion over a 10-year horizon. Combining this target spread and the difference gives the actual (predicted) spread in the next 10 years. This spread is translated into a spread return by simply using the spread duration: i.e.,

$$R_t = s_{t-1} + Duration_{t-1} \cdot (s_t - s_{t-1}) - default\ impact_t \quad (1)$$

where R_t and $Duration_t$ denote the spread return and duration, while s_t denotes the index spread. As with developed credit, we assess the impact of defaults and rating migrations using Moody's long-run sovereign migration matrix. We combine the spread return with the US Treasury returns.

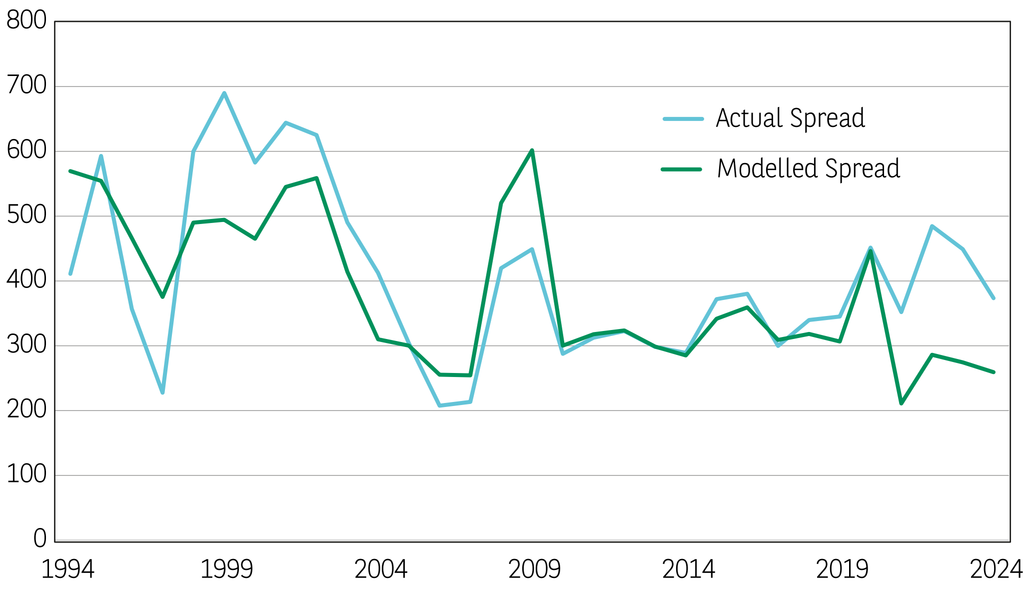
Exhibit 11 gives the expected average spread return, US Treasury return and total return at different investment horizons. For the shorter investment horizon, the expected return of underlying Treasuries and spread returns lie above and below equilibrium, respectively, as a net results total return for EMD HC lies around the equilibrium level for all investment horizons: i.e., EMD HC looks 'fair valued.'

Exhibit 11: Expected return - Emerging market debt, hard currency.

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Spread return	-0.5%	0.6%	1.4%	2.2%
US Treasury return	5.5%	4.6%	3.8%	3.0%
Total return	5.0%	5.2%	5.2%	5.2%

Source: BNP Paribas Asset Management, June 2025

Exhibit 12: Actual and modelled hard currency emerging market debt spreads (in bp).



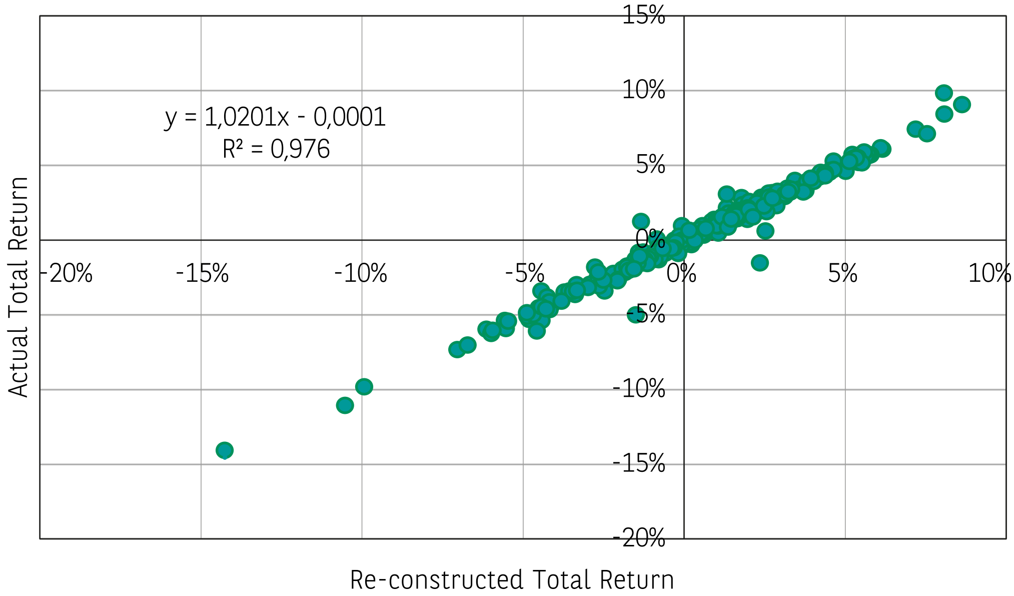
Source: Bloomberg, Moody's and BNP Paribas Asset Management, March 2024

Emerging market debt local currency

The return of EMD local currency (LC) can be decomposed into three components:
(a) **Yield** — the income return corresponding to the yield-to-maturity of the index
(b) **Duration** — the valuation return corresponding to changes in the yield
(c) **Foreign exchange (FX)** — the return coming from the evolution of EM FX vs. USD.

By adding these separate components together we can closely match the actual total return of the index. This can be seen in Exhibit 13, which shows monthly actual and re-constructed total returns of the JPM GBI EM Global Diversified Composite since 2003.

Exhibit 13: Illustrating that decomposing EMD LC in yield, duration and FX closely tracks the realised annual return of JPM GBI EM Global Diversified Composite.

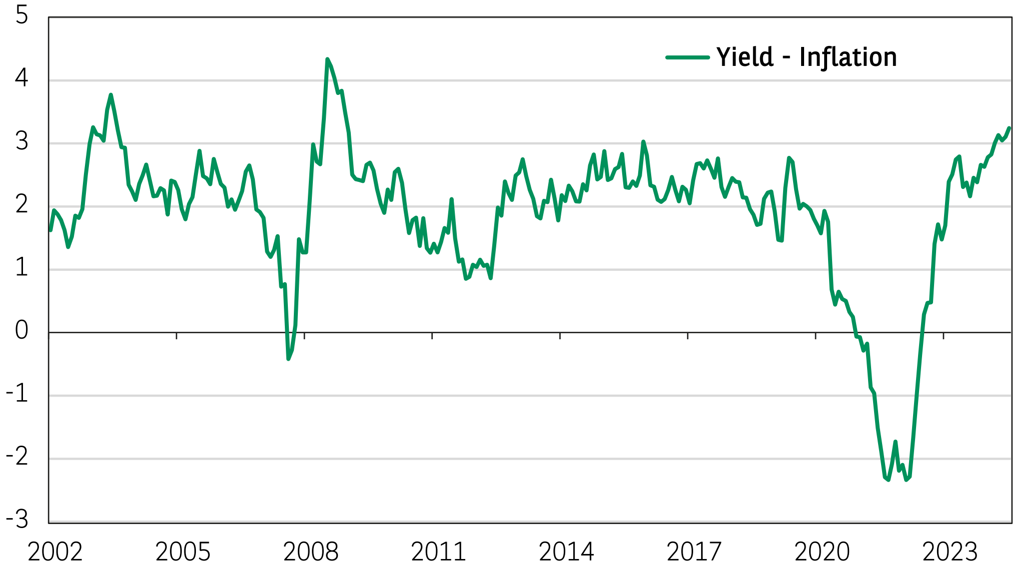


Source: JP Morgan and BNP Paribas, June 2025

As can be seen in Exhibit 14, the difference between the yield of EMD LC and the inflation rate of the corresponding EM basket has been relatively stable over the past 20 years, hovering around 2.2%. We assume that, in equilibrium, yields will adhere to this relationship, that is, yield is equal to the average inflation expectation of EM plus a spread.

Starting from the current yield level, the yield converges in 10 years to 6.2% (an equilibrium inflation expectation of 4% plus a 2.2% spread).

Exhibit 14: Difference between the yield of the JPM GBI EM Global Diversified Composite and inflation of the EM basket.



Source: Bloomberg, Moody's and BNP Paribas, June 2025

Exhibit 15 gives the expected return, at different investment horizons, for the total yield. It also shows average values for different horizons for the duration effect and foreign currencies. The duration effect is calculated using equation (1), while the impact of foreign currency exposure on EMD LC is assessed using Purchasing Power Parity (with adjustment for difference in productivity). In equilibrium, we assume a zero-currency effect.

Exhibit 15: Expected return for EMD Local Currency in USD at different investment horizons for the total yield components (inflation + spread), Duration Effect and Currency effect.

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Total Yield	6.1%	6.1%	6.2%	6.2%
Duration Effect	0.0%	-0.1%	0.0%	0.0%
FX Effect	0.4%	0.4%	0.1%	0.0%
Total Return	6.5%	6.4%	6.3%	6.2%

Source: BNP Paribas Asset Management, June 2025

EQUITIES

To model equity returns we decompose them into the various components — inflation, total yield/income and real total payout growth — which contribute to the expected return. This approach is often referred to as a total payout model.[2] With the growing importance of buybacks we prefer this approach over the dividend discount model. Additionally, a total payout method has the advantage over an earnings-driven approach in that, unlike earnings, payout is not sensitive to changes in accounting standards.

The total payout model decomposes equilibrium returns into inflation, total yield and real total payout growth. For inflation, we use the same equilibrium assumption as for fixed income. Consequently, the total payout model for real equity returns becomes the real equilibrium return plus a valuation adjustment:

Real Return = Total Yield + Real Total Payout Growth (adj B.) + Valuation Adjustments (2)

To gauge the valuation component, we look at the variation in the price to total payout (of an index). The starting point is the Cyclically Adjusted Price to Total Payout (CAPTP) ratio, calculated by taking the 10-year median real total payout divided by the current price. The idea is that the current CAPTP will converge to its equilibrium level in 10 years. However, since 2009, we have seen a spectacular increase in the balance sheets of developed economy central banks, which supported an expansion of valuation measures such as the CAPTP.

Exhibit 17 depicts this balance sheet growth versus CAPTP. Regression analyses confirm a relatively significant statistical relationship between central bank balance sheet expansion and CAPTP. These regressions are in-sample, so they do not necessarily confirm the predictive power of balance sheet expansion vis-à-vis equilibrium CAPTP.

With central banks reducing their balance sheets, however, we try to proxy the effect this may have on CAPTP and consequently on the valuation adjustment. We assume current CAPTP will converge to a long-term CAPTP adjusted for each central bank's balance sheet.

Combining the valuation adjustments with the equilibrium equity expectations over inflation gives real equity return expectations for the first 10 years. Adding the inflation equilibrium assumptions used within the fixed income model gives the total return expectations depicted in Exhibit 16.

For the developed regions, these numbers assume, after the central banks' balance sheets contracted quite a bit over the past years, relatively stable central bank balance sheets over the next 10 years; resulting in a marginal impact on the expected returns. Most large cap regional equity indices look relatively expensive while small caps look attractive.

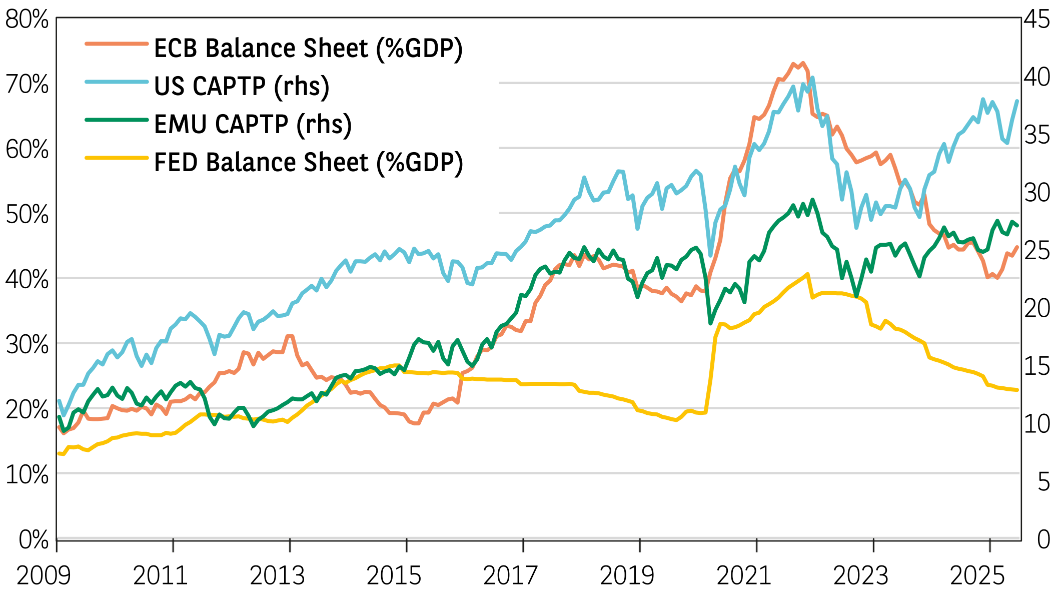
2 Philip U Straehl and Roger G. Ibbotson, "The Long-Run Drivers of Stock Returns: Total Payouts and the Real Economy" *Financial Analysts Journal*, Third Quarter 2017.

Exhibit 16: Expected equity returns in local currency for different investment horizons*

	First 5 Years	First 10 Years	First 20 Years	Equilibrium
USA	4.9%	5.4%	6.9%	8.4%
USA SC	10.6%	10.3%	9.6%	8.9%
EMU	4.9%	5.3%	6.5%	7.7%
EMU SC	9.5%	9.2%	8.4%	7.7%
UK	8.6%	8.4%	8.0%	7.5%
Japan	6.3%	6.3%	6.3%	6.3%
Emerging	10.2%	10.2%	10.2%	10.1%

*EM returns are in USD. Source: BNP Paribas Asset Management, June 2025

Exhibit 17: Balance sheet as % of GDP of FED vs. US MSCI CAPTP & ECB vs. MSCI EMU CAPTP



Source: FED, ECB and BNP Paribas Asset Management, June 2025

REAL ESTATE

We decompose real estate returns into inflation, income, growth and valuation components. To proxy the income and growth components, we rely on dividends and earnings. The model for real returns is:

Real Return = Dividend Yield + Real Earnings Growth + Valuation Adjustments (3)

The reason for choosing the dividend model instead of a total payout approach as we do for equities is twofold. Firstly, buybacks are less relevant. A large part of real estate indices consists of real estate investment trusts (REITs), which require payments in dividend for most of their taxable income. Secondly, the data on buybacks is more limited for real estate indices.

Exhibit 18 gives the expected return for real estate over different investment horizons. After the market correction we saw in 2022, real estate has not fully recovered for the US and Europe; it still looks slightly undervalued for these regions.

Exhibit 18: Expected return in local currency for real estate over different investment horizons

Total Return	First 5 Years	First 10 Years	First 20 Years	Equilibrium
Real Est. US	8.1%	8.0%	8.0%	7.9%
Real Est. Europe	8.1%	7.9%	7.4%	6.9%
Real Est. Asia-Pacific	8.1%	8.1%	8.1%	8.1%

Source: BNP Paribas Asset Management, June 2025

PRIVATE ASSETS

Private assets provide the potential to further diversify the risks in an investment portfolio. They exploit the 'illiquidity premium' as they require a long-term commitment of capital. Unlike with public assets, we do not distinguish in expected returns over different investment horizons for private assets; they represent a long-term commitment with long lead times for investing and disinvesting, making timing the market more difficult.[3]

We believe that private assets form a useful addition to a portfolio. Nonetheless, one must be very careful in comparing private and public/liquid assets solely in risk and return terms. For example, a forced sale of a private asset is usually extremely detrimental to performance, meaning there are significant tail risks. Using volatility as the sole measure of risk is therefore not ideal, but to facilitate the comparison with public/liquid assets we use volatility as the reported risk measure, cognisant that this is a simplification.

Exhibit 19 gives the return and risk for a variety of private debt and equity assets. For all private assets there is a difference between committed and actual invested capital. The expected return numbers are for invested capital only. According to Preqin (a private asset

1 New European fund regulation provides more possibilities for managing private assets in an open-ended fund structure with regular liquidity windows facilitating the investments in private assets, for more details see https://viewpoint.bnpparibas-am.com/eltif-2-0-investing-in-private-credit-through-open-ended-funds/.

index provider) historically around 25% of the capital is not invested. Whether this committed but not invested capital is kept as cash or, say, equity, will have a marked impact on the total expected return.

The risk of private equity is typically not fully reflected in the net asset value (NAV) data. This data is based on a limited number of actual transactions and hence does not fully reflect the mark-to-market risk.

Capturing the long-term risk of these kinds of investments is critical. Simply looking at the quarterly data, which only contain limited additional information, will likely lead to underestimating this risk. Instead, we try to directly estimate the longer-term risk of these investments.

For private debt, we explicitly model the risk of a portfolio of buy-and-hold loans with different vintages (i.e., maturing at different dates). The risk measured by volatility is less than that of a bond of similar rating quality but fixed duration: the dominant risk for the latter is rating migration whereas for the former, it is default.

Exhibit 19: The expected return and risk in local currency for private assets*

	Total return	Volatility
Unlisted Bond EUR Infrastructure Junior	5.2%	4.9%
Unlisted Bond EUR Infrastructure Senior	3.0%	3.9%
Unlisted Bond EUR Real Estate Senior	3.2%	2.8%
Unlisted Bond EUR SME	4.8%	4.9%
Unlisted Bond EUR Unitranche	5.9%	8.0%
Unlisted Private Equity Global	10.4%	16.5%
Unlisted Private Equity Venture Capital Global	10.2%	32.6%

*For global assets it is a cap weighted average of local returns. Source: BNP Paribas Asset Management, June 2024

66 The risk of private equity is typically not fully reflected in the net asset value data, while capturing the long-term risk of these kinds of investments is critical.

CURRENCY AND VALUATION: TO HEDGE OR NOT

All risk and return numbers are presented in local terms, avoiding the issue of what an asset's expected return will be from a particular investor's currency perspective. As a rule of thumb, we believe an investor should hedge the currency risk of their fixed-income investments as it could otherwise dominate the volatility of their fixed-income exposure.

As a proxy for the hedging cost, we take the difference between US and euro cash returns, resulting in a hedging cost of 1.5% on a 10-year horizon. The expected 4.6% local currency total return for US Treasuries (on a 10-year horizon) becomes a 3.1% euro-hedged return, which is slightly lower than the 3.3% expected return on euro sovereign core government bonds (see Exhibit 5).

Another factor in determining whether one should hedge foreign currency exposure is the return we can expect on the currency. To address this, we turn to the relative version of the Purchasing Power Parity (PPP) theory of currency determination.

In a world of free trade, the price of identical tradable goods across countries should be normalised by cross-border arbitrage. In other words, nominal exchange rates should move to offset relative changes in price levels. PPP seems to provide a good anchor for foreign exchange forecasts. However, purchasing power parity (PPP) often fails to predict short-term exchange rate movements due to market frictions, capital flows and speculative behaviour. Given the present economic landscape marked by US tariffs and a global realignment of trade patterns, this observation is particularly relevant.

The assumption is that if prices in country A rise relative to those in country B, we would expect to see a depreciation of country A's nominal exchange rate (i.e. a rise in the number of units of currency A necessary to buy one unit of currency B). An ECB study comparing equilibrium exchange rate models confirms that in terms of predictability, PPP outperforms two other fair value models.

Exhibit 20 gives the expected currency return from a euro investor's point of view. In terms of relative purchasing power parity, the US dollar (USD), British pound (GBP) and Swiss France (CHF) are overvalued versus the euro while the Japanese yen (JPY) is undervalued. Taking into account valuation, hedging costs, but also the extent to which hedging can reduce portfolio risk, we would at the moment typically advise investors to underweight the currency exposure of CHF and overweight JPY and GBP relative to their strategic weights; we are neutral on the dollar exposure mainly due the high hedging costs.

Exhibit 20: The expected currency returns for a euro-based investor over different investment horizons

Total Return	First 5 Years	First 10 Years	First 20 Years	Equilibrium
USDEUR	-1.4%	-1.2%	-0.6%	0.0%
GBPEUR	-0.9%	-0.7%	-0.4%	0.0%
JPYEUR	5.1%	4.3%	2.2%	0.0%
CHFEUR	-0.5%	-0.4%	-0.2%	0.0%

Source: BNP Paribas Asset Management, June 2025

APPENDIX

The approach

The long-term expected return views can be broken down into equilibrium returns and valuation adjustments. The idea is that financial assets typically go through economic cycles. Equilibrium returns represent the return expectations for financial assets over multiple economic cycles. Economic and financial conditions more specific to the current cycle are captured in the valuation-adjustment component.

For five to 10-year investment horizons, the valuations component is quite important, whereas for >20-year investment horizons, return expectations are dominated by the equilibrium return. Explicitly separating out the valuation component has the benefit of transparency as it shows how the valuation assumption contributes to the period return.

We have generated these expected return and risk views to facilitate the asset allocation of our clients. Some of our clients have very long liabilities, e.g., the decommissioning of a nuclear power plant could easily lead to liabilities of 50-plus years, or a pension fund with a large number of young participants could have decades-long liabilities.

Having forecasts of long-term returns and risk facilitates the design of a strategic asset allocation to finance these very long-term liabilities.

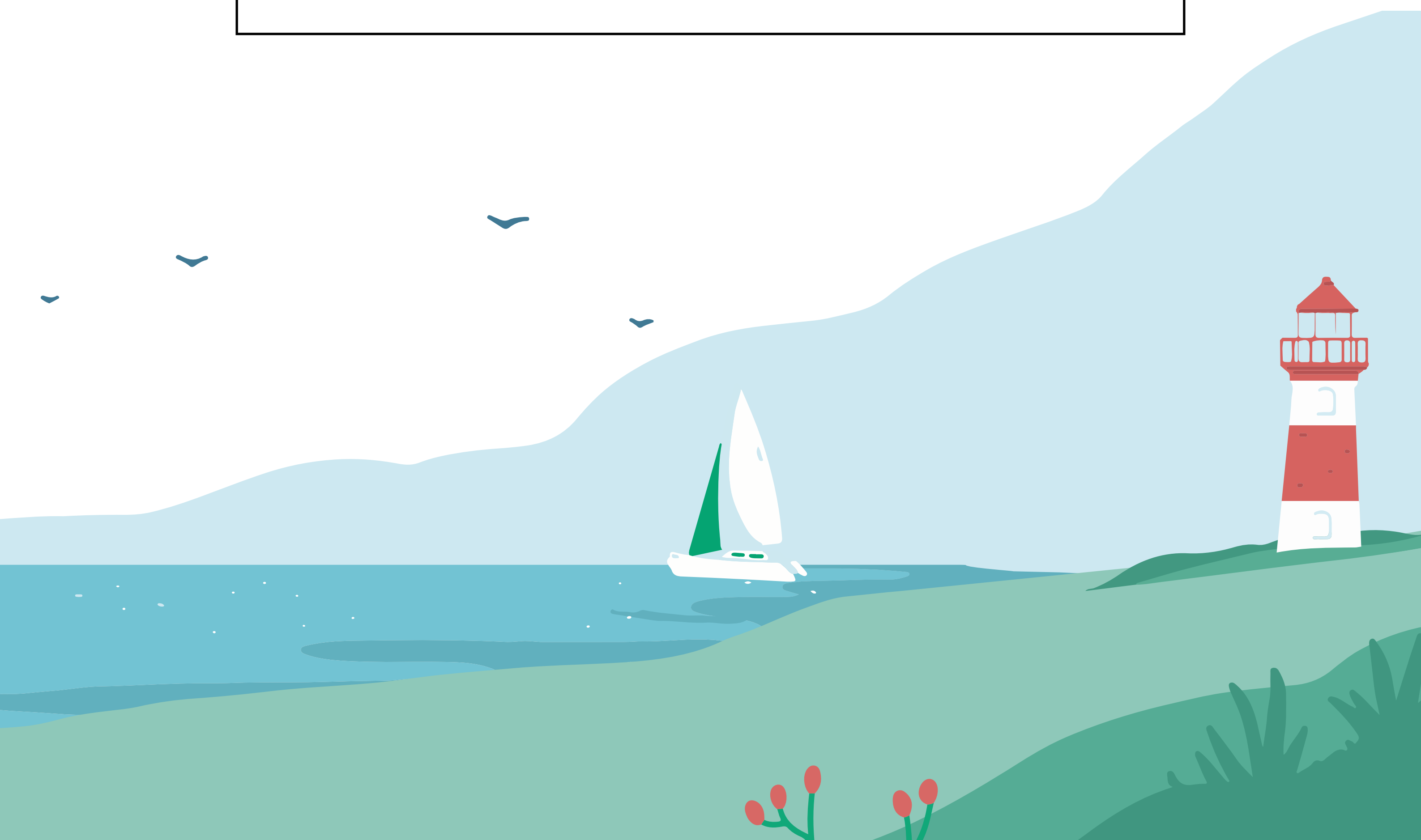


Exhibit 21: Risk and return numbers for different investment horizons in local terms*

Total Return Q2 2025	First 5 Years	First 10 Years	First 20 Years	Equilibrium
CASH				
Cash GBP	3,0%	2,5%	2,2%	1,8%
Cash EUR	1,5%	1,2%	0,9%	0,6%
Cash USD	3,4%	2,7%	2,3%	1,9%
FIXED INCOME				
Bond EUR Sovereign	4,4%	4,0%	3,1%	2,1%
Bond EUR Sovereign Core	3,7%	3,3%	2,5%	1,7%
Bond GBP Sovereign	7,1%	5,7%	4,5%	3,3%
Bond USD Sovereign	5,5%	4,6%	3,8%	3,0%
Bond EUR Inflation Linked	4,4%	3,6%	2,7%	1,7%
Bond USD Inflation Linked	7,0%	5,6%	4,5%	3,4%
Bond GBP Investment Grade	6,8%	6,0%	5,2%	4,2%
Bond GBP High Yield	6,8%	6,5%	6,1%	6,0%
Bond EUR Investment Grade	4,0%	3,7%	3,1%	2,5%
Bond EUR High Yield	4,7%	4,4%	3,9%	3,8%
Bond EUR Leveraged Loans	3,5%	3,4%	3,2%	3,2%
Bond USD Investment Grade	6,4%	5,8%	5,1%	4,3%
Bond USD High Yield	5,9%	5,6%	5,2%	5,1%
Bond USD Leveraged Loans	4,7%	4,5%	4,4%	4,3%
Bond EMD HC Sov Global	5,0%	5,2%	5,2%	5,2%
Bond EMD LC Sov Global	6,5%	6,4%	6,3%	6,2%
EQUITY				
Equity North America USA	4,9%	5,4%	6,9%	8,4%
Equity North America USA SC	10,6%	10,3%	9,6%	8,9%
Equity Europe Pan-Europe	5,5%	5,8%	6,5%	7,3%
Equity Europe EMU	4,9%	5,3%	6,5%	7,7%
Equity Pacific Japan	6,3%	6,3%	6,3%	6,3%
Equity Emerging Global	10,2%	10,2%	10,2%	10,1%
Equity Global Devel-oped Countries	5,4%	5,8%	6,9%	8,0%
ALTERNATIVES				
Alternative Real Estate Pan-Europe	8,1%	7,9%	7,4%	6,9%
Alternative Real Estate USA	8,1%	8,0%	8,0%	7,9%
Alternative Real Estate Asia-Pacific	7,7%	7,8%	7,9%	8,1%
Alternative Convertible Global	6,1%	6,0%	6,2%	6,4%
Alternative Commodity Global	10,2%	9,6%	7,8%	6,1%

Volatility Q2 2025	First 5 Years	First 10 Years	First 20 Years	Equilibrium
CASH				
Cash GBP	0,7%	0,7%	0,8%	0,9%
Cash EUR	0,5%	0,5%	0,6%	0,7%
Cash USD	0,6%	0,6%	0,6%	0,6%
FIXED INCOME				
Bond EUR Sovereign	4,9%	5,4%	5,7%	5,9%
Bond EUR Sovereign Core	4,5%	4,8%	5,0%	5,2%
Bond GBP Sovereign	6,9%	7,2%	7,2%	7,2%
Bond USD Sovereign	4,9%	5,2%	5,3%	5,3%
Bond EUR Inflation Linked	5,8%	5,9%	6,0%	4,8%
Bond USD Inflation Linked	8,3%	8,5%	8,6%	7,7%
Bond GBP Investment Grade	6,4%	6,6%	6,7%	6,8%
Bond GBP High Yield	8,1%	8,1%	8,7%	9,5%
Bond EUR Investment Grade	4,4%	4,8%	5,0%	5,2%
Bond EUR High Yield	7,1%	7,2%	7,9%	9,1%
Bond EUR Leveraged Loans	6,9%	7,0%	7,2%	7,4%
Bond USD Investment Grade	6,1%	6,3%	6,4%	6,4%
Bond USD High Yield	7,3%	7,3%	7,9%	8,6%
Bond USD Leveraged Loans	5,5%	5,5%	5,7%	6,1%
Bond EMD HC Sov Global	7,4%	7,4%	8,0%	8,8%
Bond EMD LC Sov Global	11,0%	11,0%	11,3%	11,7%
EQUITY				
Equity North America USA	15,6%	15,6%	15,3%	15,0%
Equity North America USA SC	20,9%	20,9%	20,3%	19,7%
Equity Europe Pan-Europe	13,9%	13,9%	14,5%	15,2%
Equity Europe EMU	16,2%	16,2%	16,8%	17,4%
Equity Pacific Japan	15,1%	15,1%	16,2%	17,6%
Equity Emerging Global	18,1%	18,1%	19,3%	20,7%
Equity Global Developed Countries	13,9%	13,9%	13,9%	13,9%
ALTERNATIVES				
Alternative Real Estate Pan-Europe	19,6%	19,6%	17,9%	15,7%
Alternative Real Estate USA	19,4%	19,4%	18,4%	17,2%
Alternative Real Estate Asia-Pacific	17,6%	17,6%	16,5%	15,3%
Alternative Convertible Global	11,3%	11,3%	11,3%	11,4%
Alternative Commodity Global	17,9%	17,9%	18,6%	19,4%

*Except emerging market debt in local currency and emerging equity they are in USD. Source BNPP AM, June 2025..

August 2025 - Design: Creative Services BNPP AM - P2508013

VIEWPOINT

BNP PARIBAS
ASSET MANAGEMENT

The sustainable investor for a changing world