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**Global Markets APAC** 

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The bank for a changing world

## Introducing the BNP Paribas Multi Asset Diversified (MAD) 5 AF Index

## **Index Highlights**

The BNP Paribas Multi Asset Diversified 5 AF Index ("BNPP MAD 5 AF Index") is a rules-based index comprised of eight components – three equity futures indices, three bond futures indices and two commodity indices (the "Hypothetical Portfolio"). BNPP MAD 5 AF Index seeks to measure the value of a hypothetical exposure to a range of asset classes and geographic regions based on momentum investing principles.

On a daily basis, BNPP MAD 5 AF Index determines weights of its components, using a rules-based methodology which seeks to identify weights for the components that would have resulted in the Hypothetical Portfolio with the highest return subject to a certain level of volatility. On any given day, this methodology will allocate a greater percentage of the BNPP MAD 5 AF Index towards components of the Hypothetical Portfolio that would have resulted in the Hypothetical Portfolio with the highest past returns subject to a certain level of volatility and weighting constraints<sup>2</sup>.

BNPP MAD 5 AF Index also includes an additional risk control mechanism which seeks to maintain its short-term volatility at the volatility target of 5% on a daily basis. This mechanism adds a further layer of volatility control to the value of the Hypothetical Portfolio with the goal of reducing volatility during unstable and unpredictable market periods.

BNPP MAD 5 AF Index is an "Excess Return Index" because its components are excess return and their returns are derived from changes in price (known as "price return") and profit or loss gained from rolling from one futures contract to another (known as "roll return"). Unlike Total Return Indices, it does not derive returns based on interest earned on cash or other collateral deposited in connection with the purchase of futures contracts (known as "collateral return")

The BNPP MAD 5 AF Index levels are net of rebalancing and replication fees, incorporate a daily Ajustement Factor of 1% per annum and are published on Bloomberg under the ticker BNPIMADT Index.

## **BNP Paribas MAD 5 AF Index Components**

	BNP Paribas US Equity Futures Index	BNPIFUS Index
Equity Futures	BNP Paribas Eurozone Equity Futures Index	BNPIFEU Index
Indices	BNP Paribas Japan Equity Futures Index	BNPIFJP Index
	BNP Paribas USD 10Y Futures Index	BNPIFU10 Index
Bond Futures	BNP Paribas EUR 10Y Futures Index	BNPIFE10 Index
Indices	BNP Paribas JPY 10Y Futures Index	BNPIFJ10 Index
Commodity	Bloomberg Commodity ex-Agriculture and Livestock Capped Index	BBUXALC Index
Commodity Indices	S&P GSCI Gold Index Excess Return	SPGSGCP Index

<sup>&</sup>lt;sup>1</sup>Computed based on a trend indicator that compares current component levels to past component levels over a 1 year period

## **Definitions**

A Rules-Based Index is an index where the weightings of the components are determined following a preset algorithmic set of rules and proprietary formulas.

A Futures contract is an agreement, to make and receive a cash payment based on changes in the price of a particular commodity or financial instrument at a pre-determined date in the future. The indices compiling the BNPP MAD 5 AF Index are Index Futures, which track the performance of certain futures contracts.

The Hypothetical Portfolio of the BNPP MAD 5 AF Index

represents the basket of the index's eight (8) components, whose individual weighting is dynamically adjusted on a daily basis according to the BNPP MAD 5 AF Index methodology. There is no actual portfolio of assets to which any person makes any investment or has any ownership interest.

Volatility is the amount of price variation in an asset or security. High volatility means the price moves up and down in wide ranges over a period of time. Low volatility means that the price does not change as dramatically, but rather changes at a more gradual pace.



<sup>&</sup>lt;sup>2</sup>The components' maximum weights are as follows: each Equity Futures Index 25%, each Bond Futures Index 50%, and each Commodity Index 25%. Leverage is allowed and the cost of borrowing is zero. The sum of all weights is capped at 200% and floored at 0%. Minimum weight is 0% for each component. On a daily basis the absolute change in weight for each component cannot be greater than 5%.

# Step-by-Step Composition of the BNP Paribas MAD 5 AF Index

## **Diversification**

The BNPP MAD 5 AF Index attempts to measure the hypothetical exposure to a range of asset classes and geographic regions by drawing on the performance of eight index components, which have been selected based on the following principles:

## Diversity in geographic zones covered

The components that form the BNPP MAD 5 AF Index are representative of three different geographic zones (U.S., Europe and Japan).

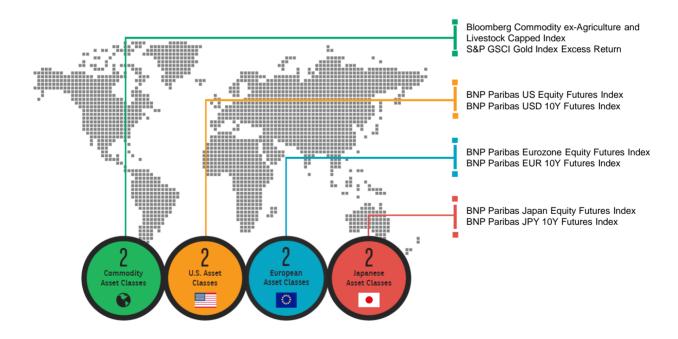
## Use of market benchmarks

The components that form the BNPP MAD 5 AF Index are futures-based indices tracking the performance of futures contracts referencing market benchmarks where such futures contracts are typically highly liquid and representative of market movement.

## Components representing multiple asset classes

The components represent a range of generally non-correlated assets including equities, commodities and government bond futures which are sub-components of the components that comprise the Index.

## A Diversified Index based on 8 Index Components



## **Definitions**

Liquidity describes the degree to which an asset or security can be quickly bought or sold in the market without affecting the asset's price.



## Step-by-Step Composition of the BNP Paribas MAD 5 AF Index

## **Dynamic Allocation**

On a daily basis, the BNPP MAD 5 AF Index dynamically rebalances the weightings of its components according to a proprietary rules-based methodology which seeks to identify weights for the components that would have resulted in the Hypothetical Portfolio with the highest past returns<sup>1</sup> subject to a certain level of volatility and weighting constraints<sup>2</sup>. This can be explained in three steps:

## Step 1

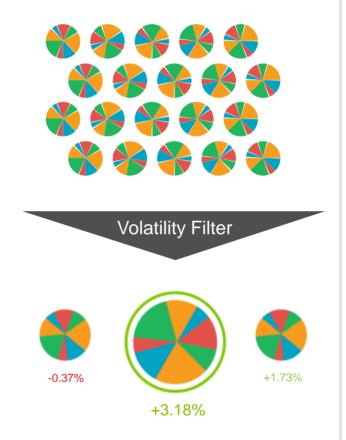
The BNPP MAD 5 AF Index begins by creating a universe of potential Hypothetical Portfolios where the components are differently weighted across the board and under weight constraints<sup>2</sup>.

## Step 2

The BNPP MAD 5 AF Index then tests the different portfolio combinations in the universe, considering only those that have demonstrated long term realized volatility below a certain level.

## Step 3

Out of the remaining portfolios after step 2, the final Hypothetical Portfolio is chosen based on the BNPP MAD 5 AF Index rules and a proprietary methodology which takes into account momentum - investing principles that allocate more to recent outperformers and less to recent underperformers.



For Illustrative Purposes Only

<sup>1</sup>Computed based on a trend indicator that compares current component levels to past component levels over a 1 year period <sup>2</sup>The components' maximum weights are as follows: each Equity Futures Index 25%, each Bond Futures Index 50%, and each Commodity Index 25%. Leverage is allowed and the cost of borrowing is zero. The sum of all weights is capped at 200% and floored at 0%. Minimum weight is 0% for each component. On a daily basis the absolute change in weight for each component cannot be greater than 5%.

## **Definitions**

The Realized Volatility of a financial instrument describes its historical volatility over a given time period.

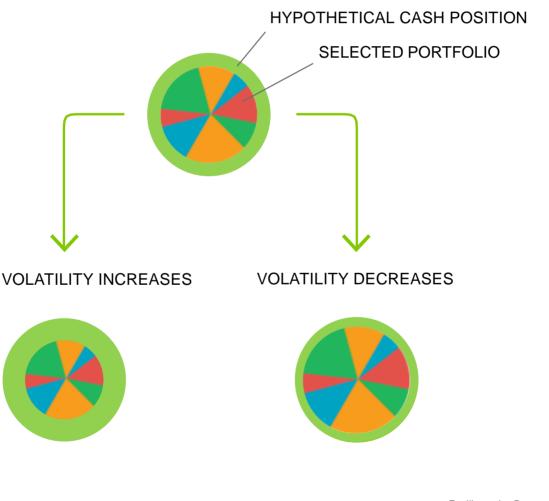
A Momentum-Based Investment Strategy seeks to capitalize on positive market price trends based on the supposition that positive market price trends may continue.



# Step-by-Step Composition of the BNP Paribas MAD 5 AF Index

## **Daily Volatility Control**

On a daily basis, the Hypothetical Portfolio of the BNPP MAD 5 AF Index targets an annualized realized volatility of 5% utilizing a set of rules that seeks to manage the hypothetical portfolio's short term volatility on a daily basis in changing market conditions. This mechanism complements the control over long-term volatility which is part of the BNPP MAD 5 AF Index's dynamic allocation methodology. (See Step 2 under "Dynamic Allocation"). The Realized Volatility of the daily hypothetical portfolio is the highest trailing 21 day historic volatility calculated over a sliding 20 day period. If the realized volatility exceeds the 5% target volatility rate on any day, the BNPP MAD 5 AF Index will reduce the weight of the hypothetical selected portfolio and rebalance it with a non-remunerable hypothetical cash position. Based on the realized volatility, the BNPP MAD 5 AF Index may be partially or wholly uninvested, and will not earn interest or any other return with respect to that cash position.

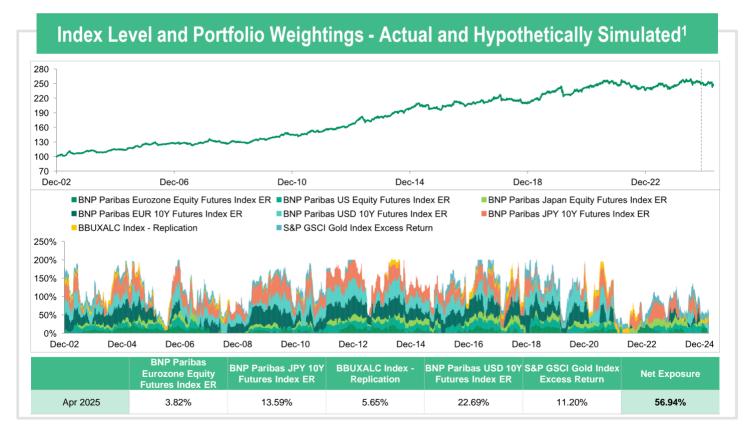




# Index Level and Past Hypothetical Portfolios Weightings (Actual and Hypothetical Simulations)

The charts and tables below show an analysis of the levels of the BNPP MAD 5 AF Index.

Index Return Summary <sup>1</sup>					Index Information		
	Since Start Date	1Y	2Y	3Y	Website Bloomberg ticker	Multi Asset Diversified 5 AF BNPIMADT Index	
Annualized Performance	4.14%	-1.95%	0.90%	-0.45%	Calculation Agent Index Sponsor	BNP Paribas Financial Markets BNP Paribas	
Annualised Volatility	4.90%	5.77%	5.25%	5.01%	Index Type  Weighting  Ajustement Factor	Excess Return  Daily rebalancing  1.0% per annum, charged on daily basis	
Sharpe Ratio	0.84	-	0.17	-	Index Publication Date <sup>1</sup>	November 22 <sup>nd</sup> 2024  December 31st 2002	



<sup>&</sup>lt;sup>1</sup>Sources: Bloomberg, BNP Paribas. Past performance is not an indicator of future performance. The BNP Paribas Multi-Asset Diversified 5 AF Index Is based on Hypothetical Past Performance Data ("PPD"). Because the BNPP MAD 5 AF Index did not exist prior to this date, all retrospective levels provided in the graph and table above are simulated and must be considered illustrative only. The presentation of hypothetical data reflects the deduction of fees and charges. These simulations are the result of estimates made by BNP Paribas at a given moment on the basis of the parameters selected by BNP Paribas, certain assumptions that may or may not hold in future periods, of market conditions at this given moment and of historical data, which should not be used as guidance, in any way, of the future results of the BNPP MAD 5 AF Index.



## Selected Risks and Considerations Associated with the Index

#### The BNPP MAD 5 AF Index levels are based on the values of notional assets and liabilities

The BNPP MAD 5 AF Index only calculates the exposure to a dynamic, Hypothetical Portfolio that tracks the excess returns of the components of the BNPP MAD 5 AF Index ("the Index Components") and is purely notional. There is no actual portfolio of assets to which any person makes any investment or has any ownership interest.

#### No recommendation

BNP Paribas makes no recommendation as to the suitability for investment of the BNPP MAD 5 AF Index or any products or strategies based partly or wholly on the BNPP MAD 5 AF Index. You should reach a decision after careful consideration with your advisors.

## Strategies relying on the levels of the BNPP MAD 5 AF Index may not be successful.

There is a risk that the rules-based methodology of the BNPP MAD 5 AF Index does not meet its stated objectives, including meeting its target volatility of 5%, which may result in underperformance of the Hypothetical Portfolio.

#### There are risks associated with an index methodology that attempts to replicate a momentum-based investment strategy.

The calculation of the BNPP MAD 5 AF Index employs a mathematical model intended to replicate what is known as a momentum-based investment strategy, which seeks to capitalize on positive market price trends based on the supposition that positive market price trends may continue. This momentum-based strategy underlying the methodology of the BNPP MAD 5 AF Index is different from a strategy that seeks long-term exposure to a Hypothetical Portfolio consisting of constant components with fixed weights. Because the level of the BNPP MAD 5 AF Index is intended to replicate the performance of the momentum-based investment strategy, these risks could also affect indirectly the performance of any product or strategy based partly or wholly on the levels of the BNPP MAD 5 AF Index. BNPP reserves the right to amend or adjust the BNPP MAD 5 AF Index methodology from time to time and accepts no liability for any such amendment or adjustment. BNPP is not under any obligation to continue the calculation, publication or dissemination of the BNPP MAD 5 AF Index and accepts no liability for any suspension or interruption in the calculation thereof. Neither BNPP nor any of its affiliates accepts any liability in connection with the publication or use of the level of the BNPP MAD 5 AF Index at any given time. This is neither an offer to sell securities or other instruments nor a solicitation of an offer to buy securities or other instruments, nor shall it be deemed to provide investment, tax, accounting or other advice.

Correlation of performances among the Index Components may reduce the levels of the BNPP MAD 5 AF Index.

Performances among the Index Components may become highly correlated from time to time. High correlation during periods of negative returns among Index Components representing any one sector or asset type that have a substantial weighting in the BNPP MAD 5 AF Index could have a material adverse effect on the levels of the BNPP MAD 5 AF Index, which could in turn negatively affect the performance any product or strategy based partly or wholly on the levels of the BNPP MAD 5 AF Index.

#### Legal and regulatory regimes may affect the BNPP MAD 5 AF Index, its Index Components or its Sub-Components.

The BNPP MAD 5 AF Index and the Index Components (and sub-components thereof) are subject to legal and regulatory regimes in various regions and, in some cases, in other countries that may change in ways that could negatively affect the BNPP MAD 5 AF Index or the Index Components (or sub-components thereof). Changes to the applicable legal or regulatory regimes may have a negative impact on the BNPP MAD 5 AF Index level. The Index Components (or sub-components thereof) that are traded on one or more public exchanges are subject to the rules of the relevant exchange.

#### The BNPP MAD 5 AF Index has Limited Historical Information.

The BNPP MAD 5 AF Index is a new index, launched on January 25th, 2016. The performance shown before that date is hypothetical past performance, based on hypothetical back-tested information. This website also contains certain performance data based on back-testing, i.e., calculations of the hypothetical levels of the BNPP MAD 5 AF Index as if it had actually existed during a defined period of time, and may in certain circumstances contain simulated levels information where the BNPP MAD 5 AF Index or asset described has recently been established or issued. Further, you must note that such analysis is based on a number of working assumptions that may not be capable of duplication in actual trading terms. Unlike actual performance records, hypothetical or simulated performances, returns or scenarios may not necessarily reflect certain market factors such as liquidity constraints, fees and transaction costs and must be considered illustrative only. Actual historical or back-tested past performance does not constitute an indication of future results. The actual performance of the BNPP MAD 5 AF Index may bear little relation to the hypothetical

## The BNPP MAD 5 AF Index has limited public information.

The BNPP MAD 5 AF Index is a custom index developed by BNP Paribas, the Index Sponsor. There is limited information relating to the BNPP MAD 5 AF Index that is publicly available. In addition, publicly available information on the BNPP MAD 5 AF Index, its methodology and its Equity Futures Indices, Bond Futures Indices and

## The BNPP MAD 5 AF Index's Daily Volatility Control mechanism may reduce the appreciation potential of the BNPP MAD 5 AF Index and may not equal the target

The BNPP MAD 5 AF Index's "volatility control" mechanism allows the BNPP MAD 5 AF Index to dynamically adjust the level of the hypothetical exposure to the selected portfolio and hypothetical cash position, depending on the volatility environment. However, the risk control overlay might limit overall levels of the BNPP MAD 5 AF Index in rising equity markets and may provide imperfect, limited protection in falling equity markets, particularly against sudden, large equity losses. There can be no assurance that such mechanism will be the most effective way to accurately assess volatility or to predict patterns of volatility. There can also be no assurance that the BNPP MAD 5 AF Index will achieve its target volatility of 5%.

The Closing Levels of the BNPP MAD 5 AF Index will include the deduction of an Adjustment Factor.

The closing level of the BNPP MAD 5 AF Index includes a deduction from the aggregate levels of its constituents of an Adjustment Factor equal to 1% per annum. As a result of this deduction, the level of the BNPP MAD 5 AF Index will trail the level of a hypothetical identical portfolio from which no such amount is deducted.

#### The BNPP MAD 5 AF Index is an "excess return" index and not a "total return" index.

In general, returns from investing in futures contracts are derived from three sources: (1) changes in the price of such futures contracts (known as the "price return"), (2) profit or loss realized when rolling from a futures contract with one expiry date to another futures contract with a different, generally later, expiry date (known as the "roll return") and (3) interest earned on the cash (or other) collateral deposited in connection with the purchases of such a futures contract (known as the "collateral return"). The Index Components generate "excess returns", meaning the sum of the price return and roll return with respect to the Index Components. As a result, an investment in an instrument linked to the BNPP MAD 5 AF Index will not generate the same returns that would be obtained from investing directly in future contracts underlying the Index Components because the collateral return is not used in calculating an "excess return" index.

The Closing Level of the BNPP MAD 5 AF Index is net of replication and rebalancing costs.

The Closing Level of the BNPP MAD 5 AF Index is net of replication and rebalancing costs associated with the BNPP MAD 5 AF Index. As a result of these costs, the level of the BNPP MAD 5 AF Index will trail the value of a hypothetical identical portfolio from which no such amount is deducted.

## BNP Paribas Financial Markets, an affiliate of the BNPP MAD 5 AF Index Sponsor, BNP Paribas, is the Calculation Agent and is responsible for calculating the BNPP

The policies and calculations for which the Calculation Agent is responsible could have an impact, positive or negative, on the level of the BNPP MAD 5 AF Index. BNP Paribas and its affiliates are under no obligation to consider your interest as an investor in a product linked to the BNPP MAD 5 AF Index.

## Portions of the BNPP MAD 5 AF Index may be effectively uninvested and earn no return.

The BNPP MAD 5 AF Index, on each day on which it is calculated, adjusts its exposure to the Index Components in an attempt to maintain a historical volatility approximately equal to an annualized volatility of 5%. If the aggregate weight of the Index Components is less than 100%, the BNPP MAD 5 AF Index will allocate exposure to a hypothetical cash position. As a result, the BNPP MAD 5 AF Index may underperform a similar index that provides 100% exposure to the Index Components. The hypothetical cash position is an uninvested position that does not earn interest or any other return



## Selected Risks and Considerations Associated with the Index

The price, level or value of the Index Components used in the BNP MAD 5 AF Index may differ from other publicly available prices

The levels of the Index Components that are Equity Futures Indices or Bond Futures Indices (the "BNPP Component Indices") are intended to reflect the performance of the relevant futures contracts on a daily volume-weighted average price, subject to a set of trade filters selected by the Index Sponsor to exclude trades with certain codes provided by the relevant exchange that indicate non-standard trades. Such levels are calculated by the Index Calculation Agent or an affiliate thereof and are not publicly available and may not reflect all trades reported by the relevant futures exchange. The daily closing price or any other price of the underlying futures contract may vary from the volume-weighted average price reflected by the level of the applicable BNPP Component Index. Furthermore, a BNPP Component Index may be subject to a disruption due to the unavailability of a volume-weighted average price despite regular trading of the underlying futures contract and the availability of a closing price for such contract.

The BNPP MAD 5 AF Index's target volatility feature may reduce its appreciation potential.

Under normal circumstances, equity or commodity futures may exhibit significantly higher volatility than the target volatility of 5%. Accordingly, the "volatility control" mechanism of the BNPP MAD 5 AF Index may have the effect of skewing allocations among eligible components in the BNPP MAD 5 AF Index toward components that provide exposure to fixed-income assets (which typically have lower volatility than components that provide exposure to equity or commodity futures) or to cash (which has zero volatility). Index Components that typically have lower volatility may have lower return potential than components that typically have higher volatility, and any allocation to cash will earn no return at all. Moreover, if the BNPP MAD 5 AF Index has a relatively high allocation to components that provide exposure to fixed-income assets, it will be particularly sensitive to factors that adversely affect the value of fixed-income instruments, such as increases in interest rates or declining perceptions of credit quality. A high allocation to components that provide exposure to fixed-income assets may also cause the BNPP MAD 5 AF Index to underperform a portfolio more heavily weighted with higher volatility assets under certain circumstances. For example, in an equity bull market that is accompanied by rising interest rates, a portfolio heavily weighted with components that provide exposure to fixed-income assets might decline in value as a result of the rising interest rates, while a portfolio heavily weighted with components that provide exposure to equities would appreciate in value.

#### Other Key Risks:

- The BNPP MAD 5 AF Index involves daily rebalancing that is applied to the Index Components by asset type and geographical region. Changes in the value of the Index Components may offset each other
- The BNPP MAD 5 AF Index is subject to risks associated with non-U.S. markets.
- The futures contracts underlying the Index Components are subject to currency exchange risk. The BNPP MAD 5 AF Index contains a currency hedge mechanism that seeks to reduce losses due to currency exchange risk. It can also reduce or eliminate gains from currency exchange risk.
- BNP Paribas is the sponsor of the Equity Futures Indices and Bond Futures Indices that underlie the BNPP MAD 5 AF Index.

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