The JPMorgan Optimax

Index Rules

J.P.Morgan

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1. Introduction

This document comprises the rules (the *Rules)* of the JPMorgan Optimax, a family of notional rules-based proprietary commodity indices that are based on a momentum investment strategy subject to certain Constraints. These Rules apply in full to each individual index (each referred to as *Optimax*) save that in the relevant Appendix of these Rules, there is one Appendix specific to each index. These Rules may be amended from time to time at the discretion of J.P. Morgan Securities Limited (*JPMSL*) and will be promptly re-published following such amendment. In particular, the Rules can be amended at any time to add a new Appendix describing an Optimax index.

These Rules are published by JPMSL of 125 London Wall, London EC2Y 5AJ, UK in its capacity as Optimax Calculation Agent.

ALL PERSONS READING THIS DOCUMENT SHOULD REFER TO THE RISK FACTORS, DISCLAIMERS AND CONFLICTS SECTIONS (SET OUT IN THE RELEVANT APPENDIX, ANNEX 4 **AND** ANNEX 5**) AND CONSIDER THE INFORMATION CONTAINED IN THIS DOCUMENT IN LIGHT OF SUCH RISK FACTORS, DISCLAIMERS AND CONFLICTS.**

NOTHING HEREIN CONSTITUTES AN OFFER TO BUY OR SELL ANY SECURITIES, PARTICIPATE IN ANY TRANSACTION OR ADOPT ANY INVESTMENT STRATEGY OR LEGAL, TAX, REGULATORY OR ACCOUNTING ADVICE.

2. General Notes on Optimax

Optimax is a notional dynamic portfolio comprised of Constituents representing assets within the global commodities market. The Constituents are described in the relevant Appendix of these Rules. The weight assigned to each Constituent will be determined from time to time in accordance with these Rules and may be zero, as more fully described in paragraph 5 (*Optimax Weights*) and in the relevant Appendix. Optimax is rebalanced on a monthly basis using an investment strategy based on the momentum theory and the modern portfolio theory. The rebalancing methodology therefore seeks to capitalize on both positive and negative trends in the USD Level of the Constituents on the assumption that if certain Constituents performed well in the past they will continue to perform well in the future and if they performed badly they will continue to do so.

No assurance can be given that the investment strategy used to construct Optimax will be successful or that Optimax will outperform any alternative portfolio or investment strategy that might be constructed from the Constituents.

On the Rebalancing Observation Date, the Optimax Calculation Agent will determine the weight to be assigned to each Constituent on the relevant Rebalancing Date, in accordance with the methodology set out in the relevant Appendix of this document. The calculation of the weights to be assigned to the Constituents in respect of each Rebalancing Date will depend on (a) the returns of the Constituents over the previous 252 Constituent Publication Days, including the Rebalancing Observation Date if that day is a Constituent Publication Day (approximately 12 months) as well as (b) the standard deviation and correlation of daily returns of each Constituent over (i) the previous 252 Constituent Publication Days, including the Rebalancing Observation Date if that day is a Constituent Publication Day (approximately 12 months) and (ii) the previous 63 Constituent Publication Days, including the Rebalancing Observation Date if that day is a Constituent Publication Day (approximately 3 months).

In the case of each Optimax index, some or all of the Constituents may be assigned a zero weighting on any Rebalancing Date.

It should be noted that Optimax is described as a notional portfolio of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. Optimax merely identifies certain assets in the market, the performance of which will be used as a reference point for the purposes of calculating the value of Optimax. Notwithstanding the foregoing, the Optimax Calculation Agent expects that the Component of the Optimax indices will be tradeable indices, despite the fact that there is no actual portfolio of assets. Therefore, the Optimax indices may be adjusted as a result of a Hedge

Disruption Event. For more information on adjustments as a result of hedge disruption, please see Section 8.5 of these Rules.

3. Optimax Calculation Agent

JPMSL or any affiliate or subsidiary designated by it will act as calculation agent for Optimax (the *Optimax Calculation Agent*). The Optimax Calculation Agent's determinations in respect of Optimax and interpretation of the Rules shall be final. Please refer to the statement of responsibility set out in paragraph 10 (*Responsibility*) below for further information.

4. Optimax Index Values

4.1 Calculation Timeline

Subject to the occurrence or existence of a Disrupted Day or a Limit Day, the Optimax Calculation Agent will calculate the Optimax Index Values on every Dealing Day for the purposes of reporting such value (although the Optimax Calculation Agent may calculate the Optimax Index Value with greater frequency and share this calculation with its affiliates for internal purposes), based on the USD Levels of the Constituents as of such Dealing Day (each such Dealing Day, an *Optimax Valuation Day*).

Optimax Index Values will be published on Bloomberg®. at the pages indicated in the relevant Appendix, provided that the Optimax Calculation Agent shall not be obliged to publish the Optimax Index Value on any day which is a Disrupted Day (see below paragraph 7.2 for further information).

4.2 Calculation Method

Optimax Index Values will be calculated by the Optimax Calculation Agent using the algorithms set out in the relevant Appendix and Annex 1 (*Performance and Tracking Factor Calculation*) of these Rules. Optimax Index Values will be calculated and reported in USD.

The calculation method of the Optimax Index Value comprises a replication adjustment factor (the *Replication Adjustment Factor*). The Replication Adjustment Factor shall be calculated daily on an Actual/360 basis and notionally deducted daily (in arrears) from the Optimax Index Values on each Optimax Valuation Day, in accordance with the calculation formulae included in Annex 1 (*Replication Adjustment Factor*) of these Rules. The Replication Adjustment Factor is equal to ninety-six basis points per year (0.96%).

4.3 Calculation Precision

Optimax Index Values will be calculated using 64-bit double precision floating-point arithmetic as defined by the IEEE 754 standard.

5. Optimax Weights

Optimax assigns rebalancing weights (the *Rebalancing Weights*) to the Constituents in accordance with the methodology set out in the relevant Appendix of theses Rules.

The Rebalancing Weights will conform to various Constraints (as described in the relevant Appendix for each Optimax index) except that due to the effect of rounding (as described in the relevant Appendix for each Optimax index) the Rebalancing Weights may contravene the intended Constraints by a small amount, in any case no greater than 0.09%.

The dollar weights of the Constituents of Optimax may fluctuate during the period from (and excluding) one Rebalancing Date to (and including) the following Rebalancing Date due to movements in the USD Level of each of those Constituents. This may have the effect of the dollar weights violating any of the Constraints of the Optimax index between Rebalancing Dates.

6. Rebalancing Methodology

Subject to the occurrence or existence of a Disrupted Day or a Limit Day, Optimax will be rebalanced on a monthly basis on the relevant Rebalancing Date (specified in the relevant Appendix), based on the performance of the Constituents over a period approximately equal to the previous 12 months, as more fully described in the relevant Appendix. For the avoidance of doubt, each Optimax index has its own Rebalancing Date. The rebalancing will be carried out using the algorithm(s) and methodology set out in the relevant Appendix of these Rules.

7. Market Disruption and Limit Events

7.1 Relevant Observation Period for the purpose of the Weighting Algorithm as described in the Appendices

If the Index Sponsor fails to publish the USD Level for any Constituent on any Constituent Publication Day in the Relevant Observation Period, then the USD Level of each such Constituent will be that at the close of the latest preceding day for which the relevant Index Sponsor has calculated and published the USD Level for that Constituent.

7.2 Optimax Index Value

If any Optimax Valuation Day (irrespective of whether it is a Rebalancing Date) is a Disrupted Day or a Limit Day in respect of any Constituent (each, an *Affected Constituent*), then that Optimax Valuation Day shall remain the day originally scheduled, but publication of the Optimax Index Value in respect of that Optimax Valuation Day will be delayed. The Optimax Index Value in respect of that Optimax Valuation Day will be calculated retroactively based on (a) the USD Levels of the Constituents (other than the Affected Constituent(s)) on the originally scheduled Optimax Valuation Day and (b) the USD Level of each Affected Constituent on the next Scheduled Trading Day that is not a Limit Day or a Disrupted Day for that Constituent, unless, in respect of any Affected Constituent(s), the ten Scheduled Trading Days immediately following the day originally scheduled to be that Optimax Valuation Day are all Disrupted Days or Limit Days for such Affected Constituent(s), in which case on the tenth Scheduled Trading Day following the day originally scheduled to be the relevant Optimax Valuation Day the Optimax Calculation Agent shall calculate the Optimax Index Value for the relevant Optimax Valuation Day using levels for such Affected Constituent(s) calculated by the Optimax Calculation Agent acting in good faith using such information and/or methods as it determines, in its reasonable discretion, are appropriate (notwithstanding that such day is a Disrupted Day or a Limit Day for one or more Constituents).

Notwithstanding the previous paragraph, the Optimax Calculation Agent shall not be obliged to publish the Optimax Index Value for any day which is a Disrupted Day for any Constituent.

8. Extraordinary Events

8.1 Successor Constituent

If any Constituent is (a) not calculated and announced by the relevant Index Sponsor but is calculated and announced by a successor sponsor acceptable to the Optimax Calculation Agent, or (b) replaced by a successor index using, in the determination of the Optimax Calculation Agent, the same or substantially similar formula and method of calculation as used in the calculation of the relevant Constituent, then in each case that successor index (the *Successor Constituent*) will be deemed to replace the relevant Constituent with effect from a date determined by the Optimax Calculation Agent, and the Optimax Calculation Agent may make such adjustment to these Rules, as it determines in good faith is appropriate to account for such change.

8.2 Alteration of Constituents

Without prejudice to the ability of the Optimax Calculation Agent to amend the Rules generally as referred to in paragraph 1 (*Introduction*) above, the Optimax Calculation Agent may, acting in good faith and in a commercially reasonable manner, exclude, or substitute for, any Constituent in circumstances in which it reasonably considers it would be unreasonable not to do so, adjust the universe of Constituents to reflect the intention of the Optimax strategy in the altered and un-anticipated circumstances which have then arisen,

including (without prejudice to the generality of the foregoing) changes announced by the Index Sponsor relating to the modification, exclusion, inclusion or substitution of one Constituent or its futures and options contracts in the Standard & Poor's Goldman Sachs Commodity Index (previously the Goldman Sachs Commodity Index), or any perception among market participants generally that the published USD Level of the relevant Constituent is generally inaccurate (and the Index Sponsor of such Constituent fails to correct such USD Level), and if it so excludes or substitutes for any Constituent, then the Optimax Calculation Agent may make such adjustment to these Rules as it determines in good faith to be appropriate to account for such exclusion or substitution on such date(s) selected by the Optimax Calculation Agent.

8.3 Material Change

If, at any time, the Index Sponsor of a Constituent announces that it will make a material change in the formula or the method of calculating that Constituent (including but not limited to rebasing) or in any other way materially modifies that Constituent (other than a modification prescribed in that formula) or permanently cancels the Constituent and no successor index exists or fails to calculate and announce the USD Level of the Constituent, then the Optimax Calculation Agent may remove such Constituent from the universe of the Constituents and may make such adjustment to these Rules as it determines in good faith to be appropriate to account for such change(s) on such date(s) selected by the Optimax Calculation Agent.

8.4 Cancellation of Index Licence

If, at any time, the licence granted to the Optimax Calculation Agent by the Index Sponsor of any Constituent to use such Constituent for the purposes of Optimax terminates, or the Optimax Calculation Agent's right to use the Constituent for the purposes of Optimax is otherwise impaired or ceases (for any reason), then the Optimax Calculation Agent will remove such Constituent from the universe of the Constituents and may make such adjustment to these Rules as it determines in good faith to be appropriate to account for such change(s) on such date(s) selected by the Optimax Calculation Agent.

8.5 Adjustments or Cancellation of an Optimax index as a Result of a Hedge Disruption Event

If the Optimax Calculation Agent determines in good faith and a commercially reasonable manner that a Hedge Disruption Event has occurred in respect of one or several Constituents, the Optimax Calculation Agent may, acting in good faith and in a commercially reasonable manner, exclude or replace any Constituent affected by such Hedge Disruption Event. In order to effectuate such exclusion or replacement, the Optimax Calculation Agent will publish (i) its adjustments to the universe of Constituents, including but not limited to, publishing a list of the Constituents to be excluded and/or a list of new constituents to be included (as replacements for the removed Constituents) on a going forward basis, provided that the new constituents shall be commodity indices or basket of commodity futures and (ii) the date on which such adjustments will become effective.

The Optimax Calculation Agent will endeavour to complete any exclusion or substitution as soon as possible in light of the prevailing circumstances and if possible on the next Rebalancing Date. The Optimax Calculation Agent may also publish of its desire to have an interim Rebalancing Observation Date or an interim Rebalancing Date, pursuant to which the Optimax Calculation Agent may rebalance the Optimax indices at a date earlier than the next Rebalancing Date based on the procedures set forth in the relevant Annex. The Optimax Calculation Agent will re-weight on the Rebalancing Observation Date (or as the case may be on the interim Rebalancing Observation Date) and rebalance the notional portfolio of each Optimax indices on the relevant Rebalancing Date (or as the case may be on the relevant interim Rebalancing Date) in accordance with the procedures set forth in the relevant Appendix. In such cases, (i) exclusion of the affected Constituents and rebalancing of the weights of the Constituents or (i) substitution of the Constituents affected by such Hedge Disruption Event by the new constituents (the "New Constituents") and rebalancing of the weights of the Constituents will take effect immediately following the close of such Rebalancing Date.

The Optimax Calculation Agent is under no obligation to continue the calculation and publication of any Optimax indices and upon the occurrence or existence of a Hedge Disruption Event, the Optimax Calculation Agent may decide to cancel any Optimax indices if it determines, acting in good faith and in a commercially reasonable manner, that the objective of the relevant Optimax index can no longer be achieved.

9. Corrections

In the event that (a) the USD Level of any Constituent used to calculate the Optimax Index Value on any Optimax Valuation Day is subsequently corrected and the correction is published by the relevant Index Sponsor before the next following Rebalancing Date or (b) the Optimax Calculation Agent identifies an error or omission in any of its calculations or determinations in respect of Optimax, then the Optimax Calculation Agent may, if practicable and the correction is deemed material by the Optimax Calculation Agent, adjust or correct the Optimax Index Value published in respect of the relevant Optimax Valuation Day and each subsequent Optimax Valuation Day and publish such corrected Optimax Index Value(s) as soon as it is reasonably practicable.

10. Responsibility

The Optimax Calculation Agent shall act in good faith and in a commercially reasonable manner.

Whilst these Rules are intended to be comprehensive, ambiguities may arise. In such circumstances the Optimax Calculation Agent will resolve such ambiguities in a reasonable manner and, if necessary, amend these Rules to reflect such resolution.

Neither the Optimax Calculation Agent nor any or its affiliates or subsidiaries or any of their respective directors, officers, employees, delegates or agents (each a *Relevant Person*) shall have any responsibility to any person (whether as a result of negligence or otherwise) for any determinations made or anything done (or omitted to be determined or done) in respect of Optimax or in respect of the publication of the Optimax Index Value (or failure to publish such value) and any use to which any person may put Optimax or Optimax Index Values. All determinations of the Optimax Calculation Agent in respect of Optimax shall be final, conclusive and binding and no person shall be entitled to make any claim against any of the Relevant Persons in respect thereof. Once a determination or calculation is made or action taken by the Optimax Calculation Agent or any other Relevant Person in respect of Optimax, neither the Optimax Calculation Agent nor any other Relevant Person shall be under any obligation to revise any determination or calculation made or action taken for any reason.

Appendix 1: JPMorgan Optimax Market-Neutral Index

Ap.1.1 Rebalancing Methodology

The JPMorgan Optimax Market-Neutral Index (henceforth the *Optimax Market-Neutral Index*) is rebalanced every month on the rebalancing date (the *Rebalancing Date*). The Rebalancing Date for the Optimax Market-Neutral Index will occur on the 17th Dealing Day of every month, subject to the occurrence of a Hedge Disruption Event and the specification of an interim Rebalancing Date. On each Rebalancing Observation Date, the Optimax Calculation Agent will determine for each Constituent a Rebalancing Weight (which may be positive, negative or zero, but which will not be less than the Minimum Asset Weight or greater than the Maximum Asset Weight) using the algorithms set out in this Appendix 1. The Rebalancing Observation Date for the Optimax Market-Neutral Index will occur on the 16th Dealing Day of every month, subject to the occurrence of a Hedge Disruption Event and the specification of an interim Rebalancing Observation Date.

Ap.1.2 Constraints

The set of Rebalancing Weights for the portfolio of Constituents comprising the Optimax Market-Neutral Index is subject to a number of Constraints outlined below. The algorithms set out in this Appendix 1 are designed to calculate a set of Rebalancing Weights that satisfy all such Constraints, subject to the proviso that the effect of rounding may induce minor violations of certain Constraints.

Ap.1.2.1 Allocation Constraints

The Allocation Constraints seek to ensure that the set of Rebalancing Weights for the portfolio of Constituents satisfies objectives regarding diversification (Asset Weight Constraint, Sector Weight Constraint), market-neutrality (Net Weight Constraint) and total exposure (Gross Weight Constraint).

Ap.1.2.1.1 Asset Weight Constraint

The Asset Weight Constraint seeks to ensure that the Rebalancing Weight for each Constituent lies between the Minimum Asset Weight (henceforth *MinAW*) and the Maximum Asset Weight (henceforth *MaxAW*) both inclusive.

Ap.1.2.1.2 Sector Weight Constraint

The Sector Weight Constraint seeks to ensure that the sum of the Rebalancing Weights for each Constituent in a Sector lies between the Minimum Sector Weight (henceforth *MinSW*) and the Maximum Sector Weight (henceforth *MaxSW*) both inclusive.

Ap.1.2.1.3 Net Weight Constraint

The Net Weight Constraint seeks to ensure that the sum of the Rebalancing Weights for each Constituent is equal to zero.

Ap.1.2.1.4 Gross Weight Constraint

The Gross Weight Constraint seeks to ensure that the sum of the absolute values of the Rebalancing Weights for each Constituent is no greater than the Gross Cap (henceforth *GrossCap*).

Ap.1.2.2 Short Term Volatility Constraint

The Short Term Volatility Constraint seeks to ensure that the Short Term Volatility of the portfolio of Constituents is no greater than the Volatility Cap (henceforth *VolCap*).

Ap.1.2.3 Long Term Volatility Constraint

The Long Term Volatility Constraint seeks to ensure that the Long Term Volatility of the portfolio of Constituents is no greater than the VolCap.

Ap.1.2.4 Constraint Values

The value for each Constraint is shown in Table Ap.1 - 1: Constraint Values below.

Constraint	Value
MinAW	-10%
MaxAW	+10%
MinSW	-20%
MaxSW	+20%
GrossCap	100%
VolCap	5%

Table Ap.1 - 1: Constraint Values

Ap.1.3 Weighting Algorithm

The Weighting Algorithm is designed to seek, for a given Rebalancing Observation Date, a set of Rebalancing Weights that maximises the Estimated Portfolio Return given the Constituent Predicted Return (henceforth CPR_i) for each Constituent i, subject to the Constraints.

The Weighting Algorithm consists of four successive steps:

- Step 1: Determining Constituent Predicted Returns and Covariance,
- Step 2: Determining Efficient Weights,
- Step 3: Scaling Weights to Satisfy the Long Term Volatility Constraint, and
- Step 4: Rounding the Weights.

Ap.1.3.1 Step1: Measuring Constituent Predicted Returns and Covariance

Ap.1.3.1.1 Measuring Constituent Predicted Returns

For each Constituent i, the Constituent Predicted Return (CPR_i) will be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CPR}_i = \sum_{h=1}^{12} \mathrm{SW}_i(h) \times \mathrm{Ln}\left(\frac{\mathrm{Level}_i(h \times 21)}{\mathrm{Level}_i((h-1) \times 21)} \right)$$

Where Seasonal Weighting (henceforth $SW_i(h)$) means:

$$\mathrm{SW}_i(h) = \begin{cases} 1/9 & \text{if } i \in \text{SeasonalConstituents and } h \in \{1,2,3,10,11,12\} \\ 1/18 & \text{if } i \in \text{SeasonalConstituents and } h \in \{4,5,6,7,8,9\} \\ 1/12 & \text{Otherwise} \end{cases}$$

Where the set Seasonal Constituents is defined in Table Ap.1 - 4: Seasonal Constituents;

Where Ln(.) means the natural logarithm; and

Where $\mathrm{Level}_i(d)$ means the USD Level of Constituent i at the close of the d^{th} Constituent Publication Day of the Relevant Observation Period, where the earliest Constituent Publication Day of the Relevant Observation Period shall be the 0^{th} Constituent Publication Day, and the latest Constituent Publication Day of the Relevant Observation Period shall be the 252^{nd} Constituent Publication Day.

Ap.1.3.1.2 Measuring Covariance

The Constituent Short Term Covariance for each pair of Constituents i,j (henceforth the $CSTC_{i,j}$) shall be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CSTC}_{i,j} = \frac{252}{63}\sum_{d=1}^{63}\left(\mathrm{CDR}_i(189+d) - \mathrm{CSTRM}_i\right)\times\left(\mathrm{CDR}_j(189+d) - \mathrm{CSTRM}_j\right)$$

Where the Constituent Short Term Return Mean for Constituent i (henceforth *CSTRM$_i$*) shall be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CSTRM}_i = \frac{1}{63}\sum_{d=1}^{63}\mathrm{CDR}_i(189+d)$$

And where the Constituent Daily Return for Constituent i on Constituent Publication Day d (henceforth *CDR$_i$(d)*) is defined as:

$$\mathrm{CDR}_i(d) = \frac{\mathrm{Level}_i(d)}{\mathrm{Level}_i(d-1)} - 1$$

Ap.1.3.2 Step 2: Determining the Efficient Weights

Step 2 can be divided into 2 parts (i) the Intermediate Rebalancing Weights Procedure and, (ii) the Efficient Weights Procedure. For a given value of Theta, the Intermediate Rebalancing Weights Procedure aims to produce a portfolio of Constituents that maximises the Intermediate Utility (as defined below) subject to the Allocation Constraints. The Efficient Weights Procedure repeats the Intermediate Rebalancing Weights Procedure for various values of Theta seeking a portfolio that satisfies the Short Term Volatility Constraint whilst having the greatest possible Estimated Portfolio Return.

Ap.1.3.2.1 Intermediate Rebalancing Weights Procedure

The Intermediate Rebalancing Weights Procedure proceeds by iteration, considering various weights (*W$_i$*) and applying modifications to such W_i with the aim of increasing the Intermediate Utility subject to the Allocation Constraints. Intermediate Utility is defined as:

$$\text{Intermediate Utility} = \mathrm{EPR} - \mathrm{Tan}(\mathrm{Theta})\times\sum_{i\in AC}\sum_{j\in AC}\mathrm{W}_i\times\mathrm{CSTC}_{i,j}\times\mathrm{W}_j$$

Where Estimated Portfolio Return (henceforth *EPR*) means:

$$\mathrm{EPR} = \sum_{i\in AC}\mathrm{W}_i\times\mathrm{CPR}_i\ ;$$

Where Tan(.) is the tangent function of trigonometry; and

Where for each Constituent i, W_i is the weight of that Constituent in the portfolio under consideration.

The Intermediate Utility is not directly used to calculate W_i in the Intermediate Rebalancing Weights Procedure. However, the mathematical derivative of the Intermediate Utility, MIU_i (as defined below), is used to identify the pair of Constituents i,j whose weight may be increased and decreased respectively in equal amounts without contravening the Allocation Constraints, whilst improving the Intermediate Utility at the greatest rate.

Ap.1.3.2.1.1 Intermediate Rebalancing Weights Procedure: Initial Weights

The initial value of all weights W_i shall be set to zero.

Ap.1.3.2.1.2 Intermediate Rebalancing Weights Procedure: Calculating the Marginal Intermediate Utility

The Marginal Intermediate Utility for each Constituent i (henceforth *MIU$_i$*) shall be calculated for the current set of weights W_i as follows:

$$\mathrm{MIU_i} = \mathrm{Round}(\mathrm{CPR_i} - \mathrm{Tan}(\mathrm{Theta}) \times 2 \times \sum_{\mathrm{j} \in \mathrm{AC}} \mathrm{CSTC_{i,j}} \times \mathrm{W_j}, 12)$$

Where Round(*x*,*y*) is defined in Annex 2. Rounding is performed so that if very similar values of $\mathrm{MIU_i}$ are obtained for different values of i, only one pair of Constituents can be chosen for modification regardless of who performs the calculation.

Ap.1.3.2.1.3 Intermediate Rebalancing Weights Procedure: Calculating $PairSlack_{i,j}$

For each Constituent pair i,j, $\mathrm{PairSlack_{i,j}}$ (as defined) specifies the maximum amount by which the weight of Constituent i may be increased and the weight of Constituent j may be decreased.

$\mathrm{GrossPairSlack_{i,j}}$ prevents the weights of Constituents i and j from switching from strictly positive to strictly negative or vice versa in a single iteration. This restriction is applied for simplicity since the impact on the gross weight of increasing or decreasing a weight changes as a weight switches from positive to negative or vice versa. In any case, as a weight is increased from negative to zero or decreased from positive to zero in one iteration the same weight may be eligible for a further change in the same direction in the following iteration since it will no longer be strictly negative or strictly positive respectively.

For a pair of Constituents i,j the $\mathrm{PairSlack_{i,j}}$ shall be calculated as:

$$\mathrm{PairSlack_{i,j}} = \mathrm{Min}(\mathrm{AssetPairSlack_{i,j}}, \mathrm{SectorPairSlack_{i,j}}, \mathrm{GrossPairSlack_{i,j}})$$

Where:

$$\mathrm{AssetPairSlack_{i,j}} = \mathrm{Min}(\mathrm{MaxAW} - \mathrm{W_i}, \mathrm{W_j} - \mathrm{MinAW})$$

Where:

$$\mathrm{SectorPairSlack_{i,j}} = \begin{cases} \mathrm{Min}(\mathrm{MaxSW} - \mathrm{SectorWeight(i)}, \mathrm{SectorWeight(j)} - \mathrm{MinSW}) & \text{if } \mathrm{Sector(i)} \neq \mathrm{Sector(j)} \\ 1000 & \text{Otherwise} \end{cases}$$

Where:

$$\mathrm{SectorWeight(i)} = \sum_{\mathrm{j} \in \mathrm{Sector(i)}} \mathrm{W_j}$$

Where 1000 has been arbitrarily selected so that in the case that i, j are in the same Sector the $\mathrm{SectorPairSlack_{i,j}}$ shall not be operative in the formula for $\mathrm{PairSlack_{i,j}}$ (since in this case increasing the weight of i and decreasing the weight of j can have no impact on the total weight of Constituents in the relevant Sector). For each Constituent i, Sector(i) is the set of Constituents in the same Sector as Constituent i as defined in Table Ap.1 - 3: Sectors,

Where:

$$\mathrm{GrossPairSlack_{i,j}} = \begin{cases} \mathrm{Min}(-\mathrm{W_i}, \mathrm{W_j}) & \text{if} \quad \mathrm{W_i} < 0 \,\text{and}\, \mathrm{W_j} > 0 \\ -\mathrm{W}_i & \text{if} \quad \mathrm{W_i} < 0 \,\text{and}\, \mathrm{W_j} \leq 0 \\ \mathrm{W_j} & \text{if} \quad \mathrm{W_i} \geq 0 \,\text{and}\, \mathrm{W_j} > 0 \\ 0.5 \times (\mathrm{GrossCap} - \mathrm{CurrentGross}) & \text{if} \quad \mathrm{W_i} \geq 0 \,\text{and}\, \mathrm{W_j} \leq 0 \end{cases}$$

Where:

$$\text{CurrentGross} = \sum_{i \in AC} \text{Abs}(W_i)$$

And where Abs(.) is the absolute function defined as:

$$\text{Abs}(x) = \begin{cases} x & \text{if} \quad x \geq 0 \\ -x & \text{Otherwise} \end{cases}$$

Ap.1.3.2.1.4 Intermediate Rebalancing Weights Procedure: Selecting the best pair of Constituents i, j

The Pair Marginal Intermediate Utility (henceforth $PairMIU_{i,j}$) for the pair of Constituents i,j reflects the rate of change of the Intermediate Utility as W_i and W_j are increased and decreased respectively. In the event that $\text{PairSlack}_{i,j}$ is zero or virtually zero (see ConstraintEpsilon below) i.e. it is not feasible to increase W_i and decrease W_j, $\text{PairMIU}_{i,j}$ shall be zero.

The pair of Constituents i,j with the Maximum Pair Marginal Intermediate Utility (henceforth $MaxPairMIU_{i,j}$) is the pair which produces the maximum positive change in the Intermediate Utility per unit of weight added to W_i and subtracted from W_j. If there is more than one pair of Constituents with the Maximum Pair Marginal Intermediate Utility, the pair for which Constituent i is first in the list in Table Ap.1 - 2: Constituents of the Optimax Market-Neutral Index shall be selected. If there is still more than one pair of Constituents with the Maximum Pair Marginal Intermediate Utility, the pair for which Constituent j is first in the list in Table Ap.1 - 2: Constituents of the Optimax Market-Neutral Index shall be selected. Hereafter, i_{best} and j_{best} will designate the Constituent i and the Constituent j thus selected.

For each pair of Constituents i,j the $\text{PairMIU}_{i,j}$ shall be calculated as:

$$\text{PairMIU}_{i,j} = \begin{cases} \text{MIU}_i - \text{MIU}_j & \text{if} \quad \text{PairSlack}_{i,j} > \text{ConstraintEpsilon} \\ 0 & \text{Otherwise} \end{cases}$$

Where ConstraintEpsilon is defined to be 0.000000001.

The MaxPairMIU shall be calculated as:

$$\text{MaxPairMIU} = \max_{i \in AC, j \in AC} \text{PairMIU}_{i,j}$$

Ap.1.3.2.1.5 Intermediate Rebalancing Weights Procedure: Setting the modification vector

The Modification Vector (henceforth *S*) shall mean:

$$S_i = \begin{cases} 1 & \text{if} \quad i = i_{best} \\ -1 & \text{if} \quad i = j_{best} \\ 0 & \text{Otherwise} \end{cases}$$

S shall be used to modify the weights of the Constituents i_{best} and j_{best} in accordance with section Ap.1.3.2.1.6 below.

Ap.1.3.2.1.6 Intermediate Rebalancing Weights Procedure: Revising the weights

An upper bound for the amount by which the weight of i_{best} and j_{best} could be changed is set out in section Ap.1.3.2.1.3 above. The actual amount by which the weight of i_{best} and j_{best} will be changed is determined by X:

$$X = \begin{cases} \text{Min}\left(\text{PairSlack}_{i_{best}, j_{best}}, \dfrac{k_0}{2 \times k_1} \right) & \text{if} \quad k_1 \neq 0 \\ \text{PairSlack}_{i_{best}, j_{best}} & \text{Otherwise} \end{cases}$$

Where:

$$k_0 = \sum_{i \in AC} S_i \times \left(CPR_i - \text{Tan}(\text{Theta}) \times 2 \times \sum_{j \in AC} CSTC_{i,j} \times W_j \right)$$

And where:

$$k_1 = \text{Tan}(\text{Theta}) \times \sum_{i \in AC} \sum_{j \in AC} S_i \times CSTC_{i,j} \times S_j$$

Then the weights W_i are each modified as follows (noting that for Constituent i other than i_{best} or j_{best} this modification has no impact):

$$W_i \mapsto W_i + S_i \times X$$

Note that throughout this document the symbol '$\mapsto$' represents assignment, meaning that the variable on the left hand side of the symbol is revised to be (i.e. its value is overwritten to take) the value on the right hand side. This symbol has been used in preference to the symbol '=' to avoid confusion in cases where the expression on the right hand side refers to the old value of the variable on the left hand side.

Ap.1.3.2.1.7 Intermediate Rebalancing Weights Procedure: Rounding the W_i

Finally, the weights for i_{best} and j_{best} are rounded as follows:

$$W_i \mapsto \text{Round}(W_i, 15)$$

Note that as only the weights for Constituents i_{best} and j_{best} have been modified, only these weights will be affected by this rounding.

Ap.1.3.2.1.8 Intermediate Rebalancing Weights Procedure: Iteration and Termination

The steps described in sections Ap.1.3.2.1.2 to Ap.1.3.2.1.7 will be repeated for the given value of Theta until any of the Intermediate Rebalancing Weights Procedure Termination Conditions (henceforth the *IRWPTC*s), described in sections Ap.1.3.2.1.8.1 to Ap.1.3.2.1.8.3, is met.

Ap.1.3.2.1.8.1 Intermediate Rebalancing Weights Procedure Termination Condition 1

Intermediate Rebalancing Weights Procedure Termination Condition 1 is met if the net effect of the two steps described in sections Ap.1.3.2.1.6 and Ap.1.3.2.1.7 is to leave all weights W_i equal to the values they had before performing those steps.

That is, either the value of X was zero, so that step Ap.1.3.2.1.6 had no effect, or the value of X was sufficiently small that after the rounding in step Ap.1.3.2.1.7 the net effect was zero.

Ap.1.3.2.1.8.2 Intermediate Rebalancing Weights Procedure Termination Condition 2

Intermediate Rebalancing Weights Procedure Termination Condition 2 is met if in the step described in section Ap.1.3.2.1.4, MaxPairMIU is less than MIUEpsilon (defined to be 0.00001).

Ap.1.3.2.1.8.3 Intermediate Rebalancing Weights Procedure Termination Condition 3

Intermediate Rebalancing Weights Procedure Termination Condition 3 is met if the steps described in sections Ap.1.3.2.1.2 to Ap.1.3.2.1.7 have been repeated 1000 times.

Ap.1.3.2.1.8.4 Consequences of Intermediate Rebalancing Weights Procedure Termination Conditions

As soon as one of the Intermediate Rebalancing Weights Procedure Termination Condition has been met for the given value of Theta, the Intermediate Rebalancing Weights Procedure finishes and for each Constituent i, IRW_i (Theta) = W_i . (For the avoidance of doubt, W_i refers to the W_i under consideration when any of the Intermediate Rebalancing Weights Procedure Termination Conditions has been met.)

Ap.1.3.2.2 Efficient Weights Procedure

The Efficient Weights Procedure is an iterative process that repeats the Intermediate Rebalancing Weights Procedure for various values of Theta, seeking a portfolio that satisfies the Short Term Volatility Constraint whilst having the greatest possible Estimated Portfolio Return. The first values for Theta will be zero and PI/2. Each new value considered for Theta will be half way between the two previous values known to be too high (corresponding to a Short Term Volatility that is too low) and too low (corresponding to a Short Term Volatility that is too high).

Given a set of weights IRW_i (Theta) produced by the Intermediate Rebalancing Weights Procedure, the Short Term Volatility (henceforth *STV*(*Theta*)) of the portfolio of Constituents with those weights is defined as:

$$\mathrm{STV(Theta)} = \sqrt{\sum_{i \in AC} \sum_{j \in AC} \mathrm{IRW_i(Theta)} \times \mathrm{CSTC_{i,j}} \times \mathrm{IRW_j(Theta)}}$$

STV(PI/2) shall be deemed to have value 0. The Short Term Volatility Constraint will be considered to be satisfied for a set of weights IRW_i (Theta) if STV(Theta) is less than or equal to the VolCap.

The Efficient Weights Procedure is executed as follows:

Ap.1.3.2.2.1 Efficient Weights Procedure: Theta = 0 Case

The Intermediate Rebalancing Weights Procedure is first executed for Theta = 0. In the case that the Short Term Volatility Constraint is satisfied, the Efficient Weights Procedure has finished, resulting in the efficient weights for each Constituent i (*Efficient Weights* or EW_i) being equal to IRW_i (0).

Otherwise, the High Volatility Theta (henceforth *HighVolTheta*) shall be set to 0, and the Low Volatility Theta (henceforth *LowVolTheta*) shall be set to PI/2. These values form upper and lower bounds respectively for the optimal value of Theta since for Theta = 0 it has been determined that the corresponding Short Term Volatility is too high and for Theta = PI/2 the portfolio has only zero weights and hence zero Expected Portfolio Return.

Step Ap.1.3.2.2.2 will then be repeated until any of the Efficient Weights Procedure Termination Conditions (henceforth the *EWPTC*) is met, as described in section Ap.1.3.2.2.3.

Ap.1.3.2.2.2 Efficient Weights Procedure: Finding the optimal value of Theta

Theta shall be set as follows:

$$\text{Theta} \mapsto \frac{1}{2}\left(\text{LowVolTheta} + \text{HighVolTheta}\right)$$

and the Intermediate Rebalancing Weights Procedure shall be executed for this value of Theta.

LowVolTheta and HighVolTheta will then be set as follows:

$$\text{LowVolTheta} \mapsto \begin{cases} \text{Theta} & \text{if} \quad \text{STV(Theta)} \le \text{VolCap} \\ \text{LowVolTheta} & \text{Otherwise} \end{cases}$$

$$\text{HighVolTheta} \mapsto \begin{cases} \text{HighVolTheta} & \text{if} \quad \text{STV(Theta)} \le \text{VolCap} \\ \text{Theta} & \text{Otherwise} \end{cases}$$

Ap.1.3.2.2.3 Efficient Weights Procedure Termination Conditions

Ap.1.3.2.2.3.1 Efficient Weights Procedure Termination Condition 1

The Efficient Weights Procedure Termination Condition 1 is met if:

$$\text{STV(HighVolTheta)} - \text{STV(LowVolTheta)} \le \text{VolEpsilon}$$

Where the Short Term Volatility Epsilon (henceforth *VolEpsilon*) is defined to be 0.0001

Ap.1.3.2.2.3.2 Efficient Weights Procedure Termination Condition 2

The Efficient Weights Procedure Termination Condition 2 is met if:

$$\text{LowVolTheta} - \text{HighVolTheta} \le \text{ThetaEpsilon}$$

Where ThetaEpsilon is defined to be 0.00000000001.

Ap.1.3.2.2.3.3 Consequences of Efficient Weights Procedure Termination Conditions

When any of the Efficient Weights Procedure Termination Conditions has been met, the efficient weights for each Constituent i resulting from the Efficient Weights Procedure (*Efficient Weights* or EW_i) are:

$$\text{EW}_i = \text{ITW}_i\left(\text{HighVolTheta}\right) \quad \text{if} \quad \text{STV(HighVolTheta)} \le \text{VolCap}$$

$$\text{EW}_i = \text{ITW}_i\left(\text{LowVolTheta}\right) \quad \text{Otherwise}$$

Ap.1.3.3 Step 3: Scaling Weights To Satisfy The Long Term Volatility Constraint

Ap.1.3.3.1 Determining the Long Term Volatility

The Long Term Volatility of the portfolio of Constituents produced by the Efficient Weights Procedure shall be calculated as:

$$\text{LTV} = \sqrt{252} \times \sqrt{\frac{1}{251}\left(\sum_{\text{d}=1}^{252}\text{PDR(d)}^2 - \frac{1}{252}\left(\sum_{\text{d}=1}^{252}\text{PDR(d)}\right)^2\right)}$$

Where the Portfolio Daily Return on Constituent Publication Day d (henceforth *PDR*(*d*)) shall be calculated as:

$$\mathrm{PDR(d)} = \frac{\mathrm{PL(d)}}{\mathrm{PL(d-1)}} - 1$$

And Where the Portfolio Level on Constituent Publication Day d, where d may vary between 0 and 252, both inclusive (henceforth *PL*(*d*)) shall be calculated as:

$$\mathrm{PL(d)} = \begin{cases} 100 & \text{if} \quad \mathrm{d} = 0 \\ \mathrm{PL(d-1)} \times \left(1 + \sum_{\mathrm{i} \in \mathrm{AC}} \mathrm{EW_i} \times \mathrm{CDR_i(d)} \right) & \text{Otherwise} \end{cases}$$

Ap.1.3.3.2 Scaling the Weights

If the Long Term Volatility Constraint is satisfied, then the Efficient Weights shall not be scaled.

Otherwise, the Efficient Weights will be reduced so that such portfolio of Constituents complies with the Long Term Volatility Constraint. The Efficient Weights shall be modified as follows:

$$\mathrm{EW_i} \mapsto \mathrm{EW_i} \times \mathrm{LTVRC}$$

Where the Long Term Volatility Rescaling Constraint (henceforth *LTVRC*) is calculated as follows:

$$\mathrm{LTVRC} = \frac{\mathrm{VolCap}}{\mathrm{LTV}}$$

The $\mathrm{EW_i}$ thus produced are the result of the Weights Scaling Procedure.

Ap.1.3.4 Step 4: Rounding the Weights

The Rebalancing Weight for each Constituent i in the set of Constituents, which pertains to the n^{th} rebalancing date (henceforth $RW_i(RD_n)$) shall be calculated from the Efficient Weight $\mathrm{EW_i}$ resulting from the Weights Scaling Procedure as follows:

$$\mathrm{RW_i(RD_n)} = \mathrm{RoundDown(EW_i, 4)}$$

Where the function RoundDown(*x*, *y*) is defined in Annex 2.

Ap.1.4 The Constituents of the Optimax Market-Neutral Index

Table Ap.1 - 2: Constituents of the Optimax Market-Neutral Index below sets out the Constituents of the Optimax Market-Neutral Index, each a single component sub-index of the S&P GSCI excess return (USD) index. Table Ap.1 - 2 also shows the Bloomberg® ticker for each Constituent (where applicable) for ease of identification.

Constituent	Bloomberg® ticker
Natural gas	SPGCNGP
Lead	SPGCILP
Gas oil	SPGCGOP
Brent Crude	SPGCBRP
Gold	SPGCGCP
Wheat	SPGCWHP
Soybean	SPGCSOP

Sugar	SPGCSBP
Coffee	SPGCKCP
Copper	SPGCICP
Aluminium	SPGCIAP
ULR Gasoline	SPGCHUP
Heating oil	SPGCHOP
Corn	SPGCCNP
WTI Crude Oil	SPGCCLP
Silver	SPGCSIP
Zinc	SPGCIZP
Nickel	SPGCIKP

Table Ap.1 - 2: Constituents of the Optimax Market-Neutral Index

Table Ap.1 - 3: Sectors below sets out the Sectors associated with the Constituents for the purposes of evaluating the function Sector(i) described in this appendix.

Constituent	**Sector**
WTI Crude Oil	Energy
Brent Crude Oil	
ULR Gasoline	
Natural Gas	
Gas Oil	
Heating Oil	
Gold	Precious Metals
Silver	
Corn	Agriculture
Soybeans	
Wheat	
Coffee	
Sugar	
Lead	Industrial Metals
Zinc	
Nickel	
Aluminium	
Copper	

Table Ap.1 - 3: Sectors

Table Ap.1 - 4: Seasonal Constituents below shows the set of Seasonal Constituents.

Seasonal Constituents
Corn
Soybeans
Wheat
Coffee
Sugar
Gas Oil
Heating Oil
ULR Gasoline
Natural Gas

Table Ap.1 - 4: Seasonal Constituents

Notwithstanding anything to the contrary, the Constituents set forth in Tables Ap. 1-2, Ap. 1-3 and Ap. 1-4 may be amended from time to time in accordance with the provisions set forth under Section 8 (*Extraordinary Events*) of these Rules.

For the avoidance of doubt, if on any Rebalancing Date, Constituents in the Basket are to be substituted by New Constituents, any references in the Weighting Algorithm performed on the Rebalancing Observation Date immediately preceding such Rebalancing Date to Constituent i or Constituent j shall be deemed to be to the New Constituents.

Ap.1.5 JPMorgan Optimax Market-Neutral Index Value Calculation

The Optimax Market-Neutral Index was first calculated on 6th May 2008 (the *First Optimax Valuation Day*) with a starting value of 100:

$$\text{CMDTOMER}(t_0) = 100$$

In accordance with the formulae below, the JPMorgan Optimax Market-Neutral Index Value (henceforth the *Optimax Market-Neutral Index Value*) on the zero-th Rebalancing Date (RD_0 = 23rd April 2008) is defined as:

$$\text{CMDTOMER}(RD_0) = 100.2324$$

At the close of each Optimax Valuation Day t (the *Relevant Optimax Valuation Day*) the Optimax Market-Neutral Index Value shall be calculated by the Optimax Calculation Agent in accordance with the following formula:

$$\text{CMDTOMER}(t) = \text{CMDTOMER}(R\,D_{n-1}) \times \left[1 + \sum_{i \in AC} RW_i(RD_{n-1}) \times \left(\frac{\text{Level}_i(t)}{\text{Level}_i(RD_{n-1})} - 1\right)\right] \times (1 - RAF_t)$$

Where:

$\text{CMDTOMER}\ (t)$	is the Optimax Market-Neutral Index Value on the Relevant Optimax Valuation Day.
n	is the number of Rebalancing Dates from, and including, the zero-th Rebalancing Date to, and including, RD_{n-1}.
RD_{n-1}	is the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
$\text{Level}_i(t)$	is the USD Level of Constituent i at the close of the Relevant Optimax Valuation Day t.
$\text{Level}_i(RD_{n-1})$	is the USD Level of Constituent i at the close of the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
$RW_i(RD_{n-1})$	is the Rebalancing Weight of the Constituent i implemented at the close of the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
RAF_t	is defined in Annex 1.
$\text{CMDTOMER}(RD_{n-1})$	is the Optimax Market-Neutral Index Value on the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day, rounded to 4 decimal places.

For the avoidance of doubt on each Rebalancing Date RD_n the Optimax Market-Neutral Index Value shall be defined as follows:

$$\text{CMDTOMER}(R\,D_n) = \text{CMDTOMER}(R\,D_{n-1}) \times \left[1 + \sum_{i \in AC} RW_i(RD_{n-1}) \times \left(\frac{\text{Level}_i(RD_n)}{\text{Level}_i(RD_{n-1})} - 1\right)\right] \times (1 - RAF_t)$$

Where:

$\text{Level}_i(\text{RD}_n)$ is the USD Level of Constituent i at the close of RD_n.

* The above calculations include the Optimax Replication Adjustment Factor, which is deducted from the Optimax Market-Neutral Index Value on each Optimax Valuation Day at a rate of 96 basis points per annum on an actual/360 basis, and the specific calculation of which is expressed in Annex 1.

Notwithstanding the forgoing formulae, the Optimax Market-Neutral Index Value shall never fall below zero. In the case that the forgoing formulae would determine a negative value, the Optimax Market-Neutral Index Value shall be defined to be zero.

Ap.1.6 Publication of the Optimax Market-Neutral Index Value

The Optimax Market-Neutral Index Value will be published on the Bloomberg® ticker CMDTOMER provided that, as described in paragraph 7.2 (*Optimax Valuation Day*) of these Rules, the Optimax Calculation Agent shall not be obliged to publish the Optimax Market-Neutral Index Value for any day which is a Disrupted Day in respect of any Constituent. The Optimax Market-Neutral Index Value will be reported to four (4) decimal places (although the Optimax Calculation Agent may maintain a record of the Optimax Market-Neutral Index Value with greater precision for internal purposes) on every Optimax Valuation Day. For the avoidance of doubt, the Optimax Calculation Agent will be under no obligation to any person to provide the Optimax Market-Neutral Index Value by any alternative method if CMDTOMER is subject to any delay in or interruptions of publication or any act of God, act of governmental authority, or act of public enemy, or due to war, the outbreak or escalation of hostilities, fire, flood, civil commotion, insurrection, labour difficulty including, without limitation, any strike, other work stoppage, or slow-down, severe or adverse weather conditions, power failure, communications line or other technological failure may occur or any other event beyond the control of the Optimax Calculation Agent.

Ap.1.7 Additional Risk Factors specific to the Optimax Market-Neutral Index

In addition to the general risk factors set out in Annex 4 of these Rules, the following risk factors are relevant to the Optimax Market-Neutral Index:

Ap.1.7.1 The use of a "long-short strategy"

The Optimax Market-Neutral Index employs a technique generally known as "long-short" strategy. This means the Optimax Market-Neutral Index could include a number of notional long positions and a number of notional short positions. Unlike long positions, short positions are theoretically subject to unlimited risk of loss because there is no limit on the amount by which the price of the relevant asset may appreciate before the short position is closed. The Optimax Market-Neutral Index may engage in notional short positions in accordance with the Optimax Market-Neutral Index Calculation Algorithms set out in this Appendix and it is therefore possible that during the time from, but excluding, one Rebalancing Date to, and including, the next following Rebalancing Date any notional short position included in the Optimax Market-Neutral Index may appreciate substantially with an adverse impact on the Optimax Market-Neutral Index Value.

Also, due to the short positions, the Optimax Market-Neutral Index Value could potentially fall to zero without any of the Constituents falling to zero.

Ap.1.7.2 Market Neutral

The Optimax Market-Neutral Index has been denominated "*Market Neutral*" because the sum of the Rebalancing Weights of all Constituents immediately after rebalancing is zero. However, because the dollar weights of the Constituents may fluctuate in between rebalancings, the net weight of the portfolio of Constituents that comprise the Optimax Market-Neutral Index may not always sum to zero. Please refer to Annex 4 and in particular paragraph An.4.7 thereof for further information.

Appendix 2: JPMorgan Optimax Plus Index

Ap.2.1 Rebalancing Methodology

The JPMorgan Optimax Plus Index (henceforth the *Optimax Plus Index*) is rebalanced every month on the rebalancing date (the *Rebalancing Date*). The Rebalancing Date for the Optimax Plus Index will occur on the 18th Dealing Day of every month, subject to the occurrence of a Hedge Disruption Event and the specification of an interim Rebalancing Date. On each Rebalancing Observation Date, the Optimax Calculation Agent will determine for each Constituent a Rebalancing Weight (which may be positive, negative or zero, but which will not be less than the Minimum Asset Weight or greater than the Maximum Asset Weight) using the algorithms set out in this Appendix 2. The Rebalancing Observation Date for the Optimax Plus Index will occur on the 16th Dealing Day of every month, subject to the occurrence of a Hedge Disruption Event and the specification of an interim Rebalancing Observation Date.

Ap.2.2 Constraints

The set of Rebalancing Weights for the portfolio of Constituents comprising the Optimax Plus Index is subject to a number of Constraints outlined below. The algorithms set out in this Appendix 2 are designed to calculate a set of Rebalancing Weights that satisfy all such Constraints, subject to the proviso that the effect of rounding may induce minor violations of certain Constraints.

Ap.2.2.1 Allocation Constraints

The Allocation Constraints seek to ensure that the set of Rebalancing Weights for the portfolio of Constituents satisfies objectives regarding diversification (Asset Weight Constraint), market exposure (Net Weight Constraint) and total exposure (Gross Weight Constraint).

Ap.2.2.1.1 Asset Weight Constraint

The Asset Weight Constraint seeks to ensure that the Rebalancing Weight for each Constituent lies between the Minimum Asset Weight (henceforth *MinAW*) and the Maximum Asset Weight (henceforth *MaxAW*) both inclusive.

Ap.2.2.1.2 Net Weight Constraint

The Net Weight Constraint seeks to ensure that the sum of the Rebalancing Weights for each Constituent lies between the Minimum Net Weight (henceforth *MinNW*) and the Maximum Net Weight (henceforth *MaxNW*) both inclusive.

Ap.2.2.1.3 Gross Weight Constraint

The Gross Weight Constraint seeks to ensure that the sum of the absolute values of the Rebalancing Weights for each Constituent is no greater than the Gross Cap (henceforth *GrossCap*).

Ap.2.2.2 Short Term Volatility Constraint

The Short Term Volatility Constraint seeks to ensure that the Short Term Volatility of the portfolio of Constituents is no greater than the Volatility Cap (henceforth *VolCap*).

Ap.2.2.3 Long Term Volatility Constraint

The Long Term Volatility Constraint seeks to ensure that the Long Term Volatility of the portfolio of Constituents is no greater than the VolCap.

Ap.2.2.4 Constraint Values

The value for each Constraint is shown in Table Ap.2 - 1: Constraint Values below.

Constraint	Value
MinAW	-25%
MaxAW	+25%
MinNW	-100%
MaxNW	100%
GrossCap	250%
VolCap	12%

Table Ap.2 - 1: Constraint Values

Ap.2.3 Weighting Algorithm

The Weighting Algorithm is designed to seek, for a given Rebalancing Observation Date, a set of Rebalancing Weights that maximises the Estimated Portfolio Return given the Constituent Predicted Return (henceforth CPR_i) for each Constituent i, subject to the Constraints.

The Weighting Algorithm consists of four successive steps:

- Step 1: Determining Constituent Predicted Returns and Covariance,
- Step 2: Determining Efficient Weights,
- Step 3: Scaling Weights to Satisfy the Long Term Volatility Constraint, and
- Step 4: Rounding the Weights.

Ap.2.3.1 Step 1: Measuring Constituent Predicted Returns and Covariance

Ap.2.3.1.1 Measuring Constituent Predicted Returns

For each Constituent i, the Constituent Predicted Return will be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CPR_i} = \sum_{h=1}^{12} \mathrm{SW_i(h)} \times \mathrm{Ln}\left(\frac{\mathrm{Level_i(h \times 21)}}{\mathrm{Level_i((h-1) \times 21)}} \right)$$

Where the Seasonal Weighting ($SW_i(h)$) means:

$$\mathrm{SW_i(h)} = \begin{cases} 1/9 & \text{if } i \in \text{SeasonalConstituents and } h \in \{1,2,3,10,11,12\} \\ 1/18 & \text{if } i \in \text{SeasonalConstituents and } h \in \{4,5,6,7,8,9\} \\ 1/12 & \text{Otherwise} \end{cases}$$

Where the set Seasonal Constituents is defined in Table Ap.2 - 3: Seasonal Constituents;

Where Ln(.) means the natural logarithm; and

Where $Level_i(d)$ means the USD Level of Constituent i at the close of the d^{th} Constituent Publication Day of the Relevant Observation Period, where the earliest Constituent Publication Day of the Relevant Observation Period shall be the 0^{th} Constituent Publication Day, and the latest Constituent Publication Day of the Relevant Observation Period shall be the 252^{nd} Constituent Publication Day.

Ap.2.3.1.2 Measuring Covariance

The Constituent Short Term Covariance for each pair of Constituents i,j (henceforth the $CSTC_{i,j}$) shall be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CSTC}_{i,j} = \frac{252}{63}\sum_{d=1}^{63}\left(\mathrm{CDR}_i(189+d) - \mathrm{CSTRM}_i\right)\times\left(\mathrm{CDR}_j(189+d) - \mathrm{CSTRM}_j\right)$$

Where the Constituent Short Term Return Mean for Constituent i (henceforth *CSTRM$_i$*) shall be calculated by the Optimax Calculation Agent according to the following formula:

$$\mathrm{CSTRM}_i = \frac{1}{63}\sum_{d=1}^{63}\mathrm{CDR}_i(189+d)$$

And where the Constituent Daily Return for Constituent i on Constituent Publication Day d (henceforth *CDR$_i$(d)*) is defined as:

$$\mathrm{CDR}_i(d) = \frac{\mathrm{Level}_i(d)}{\mathrm{Level}_i(d-1)} - 1$$

Ap.2.3.2 Step 2: Determining the Efficient Weights

Step 2 can be divided into 2 parts (i) the Intermediate Rebalancing Weights Procedure and, (ii) the Efficient Weights Procedure. For a given value of Theta, the Intermediate Rebalancing Weights Procedure aims to produce a portfolio of Constituents that maximises the Intermediate Utility (as defined below) subject to the Allocation Constraints. The Efficient Weights Procedure repeats the Intermediate Rebalancing Weights Procedure for various values of Theta seeking a portfolio that satisfies the Short Term Volatility Constraint whilst having the greatest possible Estimated Portfolio Return.

Ap.2.3.2.1 Intermediate Rebalancing Weights Procedure

The Intermediate Rebalancing Weights Procedure proceeds by iteration, considering various weights (W_i) and applying modifications to such W_i with the aim of increasing the Intermediate Utility subject to the Allocation Constraints. Intermediate Utility is defined as:

$$\text{Intermediate Utility} = \mathrm{EPR} - \mathrm{Tan}(\mathrm{Theta})\times\sum_{i\in AC}\sum_{j\in AC}\mathrm{W}_i\times\mathrm{CSTC}_{i,j}\times\mathrm{W}_j$$

Where Estimated Portfolio Return (henceforth *EPR*) means:

$$\mathrm{EPR} = \sum_{i\in AC}\mathrm{W}_i\times\mathrm{CPR}_i\ ;$$

Where Tan(.) is the tangent function of trigonometry; and

Where for each Constituent i, W_i is the weight of that Constituent in the portfolio under consideration.

The Intermediate Utility is not directly used to calculate W_i in the Intermediate Rebalancing Weights Procedure. However, the mathematical derivative of the Intermediate Utility, MIU_i (as defined below), is used to identify either i) the pair of Constituents i,j whose weight may be increased and decreased respectively in equal amounts without contravening the Allocation Constraints and simultaneously improving the Intermediate Utility at the greatest rate or ii) a single Constituent i whose weight may be increased without contravening the Allocation Constraints and simultaneously improving the Intermediate Utility at the greatest rate or iii) a single Constituent j whose weight may be decreased without contravening the Allocation Constraints, whilst improving the Intermediate Utility at the greatest rate. Whichever of the modifications to the weight(s) described in i), ii) and iii) above improves the Intermediate Utility at the greatest rate shall be selected.

Ap.2.3.2.1.1 Intermediate Rebalancing Weights Procedure: Initial Weights

The initial value of all weights W_i shall be set to zero.

Ap.2.3.2.1.2 Intermediate Rebalancing Weights Procedure: Calculating the Marginal Intermediate Utility

The Marginal Intermediate Utility for each Constituent i (henceforth MIU_i) shall be calculated for the current set of weights W_i as follows:

$$\mathrm{MIU_i} = \mathrm{Round}(\mathrm{CPR_i} - \mathrm{Tan}(\mathrm{Theta}) \times 2 \times \sum_{\mathrm{j} \in \mathrm{AC}} \mathrm{CSTC_{i,j}} \times \mathrm{W_j}, 12)$$

Where Round(*x*,*y*) is defined in Annex 2. Rounding is performed so that if very similar values of MIU_i are obtained for different values of i, only one (pair of) Constituent(s), as the case may be, can be chosen for modification regardless of who performs the calculation.

Ap.2.3.2.1.3 Intermediate Rebalancing Weights Procedure: Calculating $PairSlack_{i,j}$

For each Constituent pair i,j, $\mathrm{PairSlack_{i,j}}$ (as defined) specifies the maximum amount by which the weight of Constituent i may be increased and the weight of Constituent j may be decreased.

$\mathrm{GrossPairSlack_{i,j}}$ prevents the weights of Constituents i and j from switching from strictly positive to strictly negative or vice versa in a single iteration. This restriction is applied for simplicity since the impact on the gross weight of increasing or decreasing a weight changes as a weight switches from positive to negative or vice versa. In any case, as a weight is increased from negative to zero or decreased from positive to zero in one iteration the same weight may be eligible for a further change in the same direction in the following iteration since it will no longer be strictly negative or strictly positive respectively.

For a pair of Constituents i,j the $\mathrm{PairSlack_{i,j}}$ shall be calculated as:

$$\mathrm{PairSlack_{i,j}} = \mathrm{Min}(\mathrm{AssetPairSlack_{i,j}}, \mathrm{GrossPairSlack_{i,j}})$$

Where:

$$\mathrm{AssetPairSlack_{i,j}} = \mathrm{Min}(\mathrm{MaxAW} - \mathrm{W_i}, \mathrm{W_j} - \mathrm{MinAW})$$

Where:

$$\mathrm{GrossPairSlack_{i,j}} = \begin{cases} \mathrm{Min}(-\mathrm{W_i}, \mathrm{W_j}) & \text{if} \quad \mathrm{W_i} < 0 \,\text{and}\, \mathrm{W_j} > 0 \\ -\mathrm{W}_i & \text{if} \quad \mathrm{W_i} < 0 \,\text{and}\, \mathrm{W_j} \le 0 \\ \mathrm{W_j} & \text{if} \quad \mathrm{W_i} \ge 0 \,\text{and}\, \mathrm{W_j} > 0 \\ 0.5 \times (\mathrm{GrossCap} - \mathrm{CurrentGross}) & \text{if} \quad \mathrm{W_i} \ge 0 \,\text{and}\, \mathrm{W_j} \le 0 \end{cases}$$

Where:

$$\mathrm{CurrentGross} = \sum_{\mathrm{i} \in \mathrm{AC}} \mathrm{Abs}(\mathrm{W_i})$$

And where Abs(.) is the absolute function defined as:

$$\mathrm{Abs(x)} = \begin{cases} \mathrm{x} & \text{if} \quad \mathrm{x} \ge 0 \\ -\mathrm{x} & \text{Otherwise} \end{cases}$$

Ap.2.3.2.1.4 Intermediate Rebalancing Weights Procedure: Selecting the best pair of Constituents i, j

The Pair Marginal Intermediate Utility (henceforth $PairMIU_{i,j}$) for the pair of Constituents i,j reflects the rate of change of the Intermediate Utility as W_i and W_j are increased and decreased respectively. In the event that $PairSlack_{i,j}$ is zero or virtually zero (see ConstraintEpsilon below) i.e. it is not feasible to increase W_i and decrease W_j, $PairMIU_{i,j}$ shall be zero.

The pair of Constituents i,j with the Maximum Pair Marginal Intermediate Utility (henceforth $MaxPairMIU_{i,j}$) is the pair which produces the maximum positive change in the Intermediate Utility per unit of weight added to W_i and subtracted from W_j. If there is more than one pair of Constituents with the Maximum Pair Marginal Intermediate Utility, the pair for which Constituent i is first in the list in Table Ap.2 - 2: Constituents of Optimax Plus Index shall be selected. If there is still more than one pair of Constituents with the Maximum Pair Marginal Intermediate Utility, the pair for which Constituent j is first in the list in Table Ap.2 - 2: Constituents of Optimax Plus Index shall be selected. Hereafter, i_{best} and j_{best} will designate the Constituent i and the Constituent j thus selected.

For each pair of Constituents i,j the $PairMIU_{i,j}$ shall be calculated as:

$$PairMIU_{i,j} = \begin{cases} MIU_i - MIU_j & \text{if} \quad PairSlack_{i,j} > ConstraintEpsilon \\ 0 & \text{Otherwise} \end{cases}$$

Where ConstraintEpsilon is defined to be 0.000000001.

The MaxPairMIU shall be calculated as:

$$MaxPairMIU = \underset{i \in AC, j \in AC}{Max} PairMIU_{i,j}$$

Ap.2.3.2.1.5 Intermediate Rebalancing Weights Procedure: Calculating $UpSlack_i$

For each Constituent i, $UpSlack_i$ (as defined) specifies the maximum amount by which the weight of Constituent i may be increased.

$GrossUpSlack_i$ prevents the weight of Constituents i from switching from strictly negative to strictly positive in a single iteration. This restriction is applied for simplicity since the impact on the gross weight of increasing a weight changes as a weight switches from negative to positive. In any case, as a weight is increased from negative to zero in one iteration the same weight will be eligible for a further change in the same direction in the following iteration since it will no longer be strictly negative.

For a Constituent i the $UpSlack_i$ shall be calculated as:

$$UpSlack_i = Min(AssetUpSlack_i, GrossUpSlack_i, NetUpSlack_i)$$

Where:

$$AssetUpSlack_i = MaxAW - W_i$$

Where:

$$GrossUpSlack_i = \begin{cases} -W_i & \text{if} \quad W_i < 0 \\ GrossCap - CurrentGross & \text{Otherwise} \end{cases}$$

Where:

$$\text{CurrentGross} = \sum_{i \in AC} \text{Abs}(W_i)$$

Where Abs(.) is the absolute function defined as:

$$\text{Abs}(x) = \begin{cases} x & \text{if} \quad x \geq 0 \\ -x & \text{Otherwise} \end{cases}$$

Where:

$$\text{NetUpSlack}_i = \text{MaxNW} - \text{CurrentNet}$$

And where:

$$\text{CurrentNet} = \sum_{i \in AC} W_i$$

Ap.2.3.2.1.6 Intermediate Rebalancing Weights Procedure: Selecting i_{bestUp}

The Up Marginal Intermediate Utility (henceforth UpMIU_i) for the Constituent i reflects the rate of change of the Intermediate Utility as W_i is increased without any change to the weight of any other Constituent. In the event that UpSlack_i is zero or virtually zero (see ConstraintEpsilon below) i.e. it is not feasible to increase W_i, UpMIU_i shall be zero.

The Constituent i with the Maximum Up Marginal Intermediate Utility (henceforth MaxUpMIU) is the Constituent which produces the maximum positive change in the Intermediate Utility per unit of weight added to W_i. If there is more than one Constituent with the Maximum Up Marginal Intermediate Utility, the Constituent i which is first in the list in Table Ap.2 - 2: Constituents of Optimax Plus Index shall be selected. Hereafter, i_{bestUp} will designate the Constituent i thus selected.

For each Constituent i the UpMIU_i shall be calculated as:

$$\text{UpMIU}_i = \begin{cases} \text{MIU}_i & \text{if} \quad \text{UpSlack}_i > \text{ConstraintEpsilon} \\ 0 & \text{Otherwise} \end{cases}$$

Where ConstraintEpsilon is defined to be 0.000000001.

The MaxUpMIU shall be calculated as:

$$\text{MaxUpMIU} = \underset{i \in AC}{\text{Max}}\ \text{UpMIU}_i$$

Ap.2.3.2.1.7 Intermediate Rebalancing Weights Procedure: Calculating $DownSlack_j$

For each Constituent j, DownSlack_j (as defined) specifies the maximum amount by which the weight of Constituent j may be decreased.

GrossDownSlack_j prevents the weight of Constituents j from switching from strictly positive to strictly negative in a single iteration. This restriction is applied for simplicity since the impact on the gross weight of decreasing a weight changes as a weight switches from positive to negative. In any case, as a weight is decreased from positive to zero in one iteration the same weight will be eligible for a further change in the same direction in the following iteration since it will no longer be strictly positive.

For a Constituent j the $DownSlack_j$ shall be calculated as:

$$DownSlack_j = Min(AssetDownSlack_j, GrossDownSlack_j, NetDownSlack_j)$$

Where:

$$AssetDownSlack_j = W_j - MinAW$$

Where:

$$GrossDownSlack_j = \begin{cases} +W_j & \text{if} \quad W_j > 0 \\ GrossCap - CurrentGross & \text{Otherwise} \end{cases}$$

Where:

$$CurrentGross = \sum_{i \in AC} Abs(W_i)$$

Where Abs(.) is the absolute function defined as:

$$Abs(x) = \begin{cases} x & \text{if} \quad x \geq 0 \\ -x & \text{Otherwise} \end{cases}$$

Where:

$$NetDownSlack_j = CurrentNet - MaxNW$$

And where:

$$CurrentNet = \sum_{i \in AC} W_i$$

Ap.2.3.2.1.8 Intermediate Rebalancing Weights Procedure: Selecting $j_{bestDown}$

The Down Marginal Intermediate Utility (henceforth $DownMIU_j$) for the Constituent j reflects the rate of change of the Intermediate Utility as W_j is decreased without any change to the weight of any other Constituent. In the event that $DownSlack_j$ is zero or virtually zero (see ConstraintEpsilon below) i.e. it is not feasible to decrease W_j, $DownMIU_j$ shall be zero.

The Constituent j with the Maximum Down Marginal Intermediate Utility (henceforth MaxDownMIU) is the Constituent which produces the maximum positive change in the Intermediate Utility per unit of weight subtracted from W_j. If there is more than Constituent with the Maximum Down Marginal Intermediate Utility, the Constituent j which is first in the list in Table Ap.2 - 2: Constituents of Optimax Plus Index shall be selected. Hereafter, $j_{bestDown}$ will designate the Constituent j thus selected.

For each Constituent *j* the $DownMIU_j$ shall be calculated as:

$$DownMIU_j = \begin{cases} MIU_j & \text{if} \quad DownSlack_j > ConstraintEpsilon \\ 0 & \text{Otherwise} \end{cases}$$

Where ConstraintEpsilon is defined to be 0.000000001.

The MaxDownMIU shall be calculated as:

$$\text{MaxDownMIU} = \underset{j \in AC}{\text{Max}}\ \text{DownMIU}_j$$

Ap.2.3.2.1.9 Intermediate Rebalancing Weights Procedure: Choosing the Type Of Modification

The Type of Modification (henceforth *ModType*) shall be set as follows:

$$\text{ModType} = \begin{cases} \text{PairMod} & \text{if} \quad \text{MaxPairMIU} \geq \text{MaxUpMIU AND MaxPairMIU} \geq \text{MaxDownMIU} \\ \text{UpMod} & \text{if} \quad \text{MaxPairMIU} < \text{MaxUpMIU AND MaxUpMIU} \geq \text{MaxDownMIU} \\ \text{DownMod} & \text{Otherwise} \end{cases}$$

Where PairMod, UpMod and DownMod enumerate the choice of modification to made to the current weights in the following, and otherwise have no numerical significance. The choice of ModType reflects a preference to apply the type of modification that will improve the Intermediate Utility at the greatest rate, with the proviso that in the event of a tie, preference is given to PairMod over UpMod and DownMod, and to UpMod over DownMod.

PairMod means that the algorithm will increase $W_{i_{best}}$ and decrease $W_{j_{best}}$.

UpMod means that the algorithm will increase $W_{i_{bestUp}}$ without any change to the weight of any other Constituent.

DownMod means that the algorithm will decrease $W_{j_{bestDown}}$ without any change to the weight of any other Constituent.

Ap.2.3.2.1.10 Intermediate Rebalancing Weights Procedure: Setting the modification vector

The Modification Vector (henceforth *S*) shall mean:

$$S_i = \begin{cases} 1 & \text{if} \quad (\text{ModType} = \text{PairMod AND } i = i_{best}) \text{ OR } (\text{ModType} = \text{UpMod AND } i = i_{bestUp}) \\ -1 & \text{if} \quad (\text{ModType} = \text{PairMod AND } i = j_{best}) \text{ OR } (\text{ModType} = \text{DownMod AND } i = j_{bestDown}) \\ 0 & \text{Otherwise} \end{cases}$$

S shall be used to modify the weights, increasing the weight assigned to Constituent i_{best} or i_{bestUp} and/or decreasing the weight assigned to Constituent j_{best} or $j_{bestDown}$.

Ap.2.3.2.1.11 Intermediate Rebalancing Weights Procedure: Revising the weights

An upper bound for the amount by which the weight of i_{best} and j_{best}, i_{bestUp} or $j_{bestDown}$ could be changed is set out in sections Ap.2.3.2.1.3, Ap.2.3.2.1.5 and Ap.2.3.2.1.7 respectively. The actual amount by which the weights will be changed is determined by X:

$$X = \begin{cases} \mathrm{Min}\left(\mathrm{RelevantSlack}, \dfrac{k_0}{2 \times k_1} \right) & \text{if} \quad k_1 \neq 0 \\ \mathrm{RelevantSlack} & \text{Otherwise} \end{cases}$$

Where:

$$\mathrm{RelevantSlack} = \begin{cases} \mathrm{PairSlack}_{i_{best}, j_{best}} & \text{if} \quad \mathrm{ModType} = \mathrm{PairMod} \\ \mathrm{UpSlack}_{i_{bestUp}} & \text{if} \quad \mathrm{ModType} = \mathrm{UpMod} \\ \mathrm{DownSlack}_{j_{bestDown}} & \text{if} \quad \mathrm{ModType} = \mathrm{DownMod} \end{cases}$$

Where:

$$k_0 = \sum_{i \in AC} S_i \times \left(CPR_i - \mathrm{Tan}(\mathrm{Theta}) \times 2 \times \sum_{j \in AC} CSTC_{i,j} \times W_j \right)$$

And where:

$$k_1 = \mathrm{Tan}(\mathrm{Theta}) \times \sum_{i \in AC} \sum_{j \in AC} S_i \times CSTC_{i,j} \times S_j$$

Then the weight(s) W_i is(are) each modified as follows, noting that this modification has no impact for Constituent i other than i_{best} and j_{best} if PairMod is applicable, or other than i_{bestUp} if UpMod is applicable or other than $j_{bestDown}$ if DownMod is applicable :

$$W_i \mapsto W_i + S_i \times X$$

Note that throughout this document the symbol '$\mapsto$' represents assignment, meaning that the variable on the left hand side of the symbol is revised to be (i.e. its value is overwritten take) the value on the right hand side. This symbol has been used in preference to the symbol '=' to avoid confusion in cases where the expression on the right hand side refers to the old value of the variable on the left hand side.

Ap.2.3.2.1.12 Intermediate Rebalancing Weights Procedure: Rounding the W_i

Finally, the weight(s) is(are) rounded as follows:

$$W_i \mapsto \mathrm{Round}(W_i, 15)$$

Note that in the case that ModType equals PairMod, only the weights of Constituents i_{best} and j_{best} have been modified; in the case that ModType equals UpMod, only the weight of Constituent i_{bestUp} has been modified; in the case that ModType equals DownMod, only the weight of Constituent $j_{bestDown}$ has been modified. Correspondingly only this(these) weight(s) will be affected by rounding.

Ap.2.3.2.1.13 Intermediate Rebalancing Weights Procedure: Iteration and Termination

The steps described in sections Ap.2.3.2.1.2 to Ap.2.3.2.1.12 will be repeated for the given value of Theta until any of the Intemediate Rebalancing Weights Procedure Termination Conditions (henceforth the *IRWPTC*s), described in sections Ap.2.3.2.1.13.1 to Ap.2.3.2.1.13.3, is met.

Ap.2.3.2.1.13.1 Intermediate Rebalancing Weights Procedure Termination Condition 1

Intermediate Rebalancing Weights Procedure Termination Condition 1 is met if the net effect of the two steps described in sections Ap.2.3.2.1.11 and Ap.2.3.2.1.12 is to leave all weights W_i equal to the values they had before performing those steps.

That is, either the value of X was zero, so that step Ap.2.3.2.1.11 had no effect, or the value of X was sufficiently small that after the rounding in step Ap.2.3.2.1.12 the net effect was zero.

Ap.2.3.2.1.13.2 Intermediate Rebalancing Weights Procedure Termination Condition 2

Intermediate Rebalancing Weights Procedure Termination Condition 2 is met if, MaxPairMIU, MaxUpMIU and MaxDownMIU are all less than MIUEpsilon (defined to be 0.00001).

Ap.2.3.2.1.13.3 Intermediate Rebalancing Weights Procedure Termination Condition 3

Intermediate Rebalancing Weights Procedure Termination Condition 3 is met if the steps described in sections Ap.2.3.2.1.2 to Ap.2.3.2.1.12 have been repeated 1000 times.

Ap.2.3.2.1.13.4 Consequences of Intermediate Rebalancing Weights Procedure Termination Conditions

As soon as one of the Intermediate Rebalancing Weights Procedure Termination Condition has been met for the given value of Theta, the Intermediate Rebalancing Weights Procedure finishes and for each Constituent i, IRW_i (Theta) = W_i . (For the avoidance of doubt, W_i refers to the W_i under consideration when any of the Intermediate Rebalancing Weights Procedure Termination Conditions has been met.)

Ap.2.3.2.2 Efficient Weights Procedure

The Efficient Weights Procedure is an iterative process that repeats the Intermediate Rebalancing Weights Procedure for various values of Theta, seeking a portfolio that satisfies the Short Term Volatility Constraint whilst having the greatest possible Estimated Portfolio Return. The first values for Theta will be zero and PI/2. Each new value considered for Theta will be half way between the two previous values known to be too high (corresponding to a Short Term Volatility that is too low) and too low (corresponding to a Short Term Volatility that is too high).

Given a set of weights IRW_i (Theta) produced by the Intermediate Rebalancing Weights Procedure, the Short Term Volatility (henceforth *STV*(*Theta*)) of the portfolio of Constituents with those weights is defined as:

$$\mathrm{STV(Theta)} = \sqrt{\sum_{i \in AC} \sum_{j \in AC} \mathrm{IRW_i(Theta)} \times \mathrm{CSTC_{i,j}} \times \mathrm{IRW_j(Theta)}}$$

STV(PI/2) shall be deemed to have value 0. The Short Term Volatility Constraint will be considered to be satisfied for a set of weights IRW_i (Theta) if STV(Theta) is less than or equal to the VolCap.

The Efficient Weights Procedure is executed as follows:

Ap.2.3.2.2.1 Efficient Weights Procedure: Theta = 0 Case

The Intermediate Rebalancing Weights Procedure is first executed for Theta = 0. In the case that the Short Term Volatility Constraint is satisfied, the Efficient Weights Procedure has finished, resulting in the efficient weights for each Constituent i (*Efficient Weights* or EW_i) being equal to IRW_i (0).

Otherwise, the High Volatility Theta (henceforth *HighVolTheta*) shall be set to 0, and the Low Volatility Theta (henceforth *LowVolTheta*) shall be set to PI/2. These values form upper and lower bounds respectively for the optimal value of Theta since for Theta = 0 it has been determined that the corresponding Short Term Volatility is too high and for Theta = PI/2 the portfolio has only zero weights and hence zero Expected Portfolio Return. Step Ap.2.3.2.2.2 will then be repeated until any of the Efficient Weights Procedure Termination Conditions (henceforth the *EWPTC*) is met, as described in section Ap.2.3.2.2.3.

Ap.2.3.2.2.2 Efficient Weights Procedure: Finding the optimal value of Theta

Theta shall be set as follows:

$$\text{Theta} \mapsto \frac{1}{2}(\text{LowVolTheta} + \text{HighVolTheta})$$

and the Intermediate Rebalancing Weights Procedure shall be executed for this value of Theta.

LowVolTheta and HighVolTheta will then be set as follows:

$$\text{LowVolTheta} \mapsto \begin{cases} \text{Theta} & \text{if} \quad \text{STV(Theta)} \leq \text{VolCap} \\ \text{LowVolTheta} & \text{Otherwise} \end{cases}$$

$$\text{HighVolTheta} \mapsto \begin{cases} \text{HighVolTheta} & \text{if} \quad \text{STV(Theta)} \leq \text{VolCap} \\ \text{Theta} & \text{Otherwise} \end{cases}$$

Ap.2.3.2.2.3 Efficient Weights Procedure Termination Conditions

Ap.2.3.2.2.3.1 Efficient Weights Procedure Termination Condition 1

The Efficient Weights Procedure Termination Condition 1 is met if:

$$\text{STV(HighVolTheta)} - \text{STV(LowVolTheta)} \leq \text{VolEpsilon}$$

Where the Short Term Volatility Epsilon (henceforth *VolEpsilon*) is defined to be 0.0001

Ap.2.3.2.2.3.2 Efficient Weights Procedure Termination Condition 2

The Efficient Weights Procedure Termination Condition 2 is met if:

$$\text{LowVolTheta} - \text{HighVolTheta} \leq \text{ThetaEpsilon}$$

Where ThetaEpsilon is defined to be 0.00000000001.

Ap.2.3.2.2.3.3 Consequences of Efficient Weights Procedure Termination Conditions

When any of the Efficient Weights Procedure Termination Conditions has been met, the efficient weights for each Constituent i resulting from the Efficient Weights Procedure (*Efficient Weights* or EW_i) are:

$$\text{EW}_i = \text{ITW}_i(\text{HighVolTheta}) \quad \text{if} \quad \text{STV(HighVolTheta)} \leq \text{VolCap}$$

$$\text{EW}_i = \text{ITW}_i(\text{LowVolTheta}) \quad \text{Otherwise}$$

Ap.2.3.3 Step 3: Scaling Weights To Satisfy The Long Term Volatility Constraint

Ap.2.3.3.1 Determining the Long Term Volatility

The Long Term Volatility of the portfolio of Constituents produced by the Efficient Weights Procedure shall be calculated as:

$$\mathrm{LTV} = \sqrt{252} \times \sqrt{\frac{1}{251}\left(\sum_{d=1}^{252} \mathrm{PDR(d)}^2 - \frac{1}{252}\left(\sum_{d=1}^{252} \mathrm{PDR(d)}\right)^2\right)}$$

Where the Portfolio Daily Return on Constituent Publication Day d (henceforth *PDR*(*d*)) shall be calculated as:

$$\mathrm{PDR(d)} = \frac{\mathrm{PL(d)}}{\mathrm{PL(d-1)}} - 1$$

And where the Portfolio Level on Constituent Publication Day d, where d may vary between 0 and 252, both inclusive (henceforth *PL*(*d*)) shall be calculated as:

$$\mathrm{PL(d)} = \begin{cases} 100 & \text{if} \quad \mathrm{d} = 0 \\ \mathrm{PL(d-1)} \times \left(1 + \sum_{i \in AC} \mathrm{EW_i} \times \mathrm{CDR_i(d)}\right) & \text{Otherwise} \end{cases}$$

Ap.2.3.3.2 Scaling the Weights

If the Long Term Volatility Constraint is satisfied, then the Efficient Weights shall not be scaled.

Otherwise, the Efficient Weights will be reduced so that such portfolio of Constituents complies with the Long Term Volatility Constraint. The Efficient Weights shall be modified as follows:

$$\mathrm{EW_i} \mapsto \mathrm{EW_i} \times \mathrm{LTVRC}$$

Where the Long Term Volatility Rescaling Constraint (henceforth *LTVRC*) is calculated as follows:

$$\mathrm{LTVRC} = \frac{\mathrm{VolCap}}{\mathrm{LTV}}$$

The $\mathrm{EW_i}$ thus produced are the result of the Weights Scaling Procedure.

Ap.2.3.4 Step 4: Rounding the Weights

The Rebalancing Weight for each Constituent i in the set of Constituents, which pertains to the n^{th} rebalancing date (henceforth $RW_i(RD_n)$) shall be calculated from the Efficient Weight $\mathrm{EW_i}$ resulting from the Weights Scaling Procedure as follows:

$$\mathrm{RW_i(RD_n)} = \mathrm{RoundDown(EW_i, 4)}$$

Where the function RoundDown(*x*, *y*) is defined in Annex 2.

Ap.2.4 The Constituents of Optimax Plus Index

Table Ap.2 - 2: Constituents of Optimax Plus Index below sets out the Constituents of the Optimax Plus Index, each a single component sub-index of the S&P GSCI excess return (USD) index. Table Ap.2 - 2 also shows the Bloomberg® ticker for each Constituent (where applicable) for ease of identification.

Constituent	Bloomberg® ticker
Natural gas	SPGCNGP
Lead	SPGCILP
Gas oil	SPGCGOP
Brent Crude	SPGCBRP
Gold	SPGCGCP
Wheat	SPGCWHP
Soybean	SPGCSOP
Sugar	SPGCSBP
Coffee	SPGCKCP
Copper	SPGCICP
Aluminium	SPGCIAP
ULR Gasoline	SPGCHUP
Heating oil	SPGCHOP
Corn	SPGCCNP
WTI Crude Oil	SPGCCLP
Silver	SPGCSIP
Zinc	SPGCIZP
Nickel	SPGCIKP

Table Ap.2 - 2: Constituents of Optimax Plus Index

Table Ap.2 - 3: Seasonal Constituents below shows the set of Seasonal Constituents.

Seasonal Constituents
Corn
Soybeans
Wheat
Coffee
Sugar
Gas Oil
Heating Oil
ULR Gasoline
Natural Gas

Table Ap.2 - 3: Seasonal Constituents

Notwithstanding anything to the contrary, the Constituents set forth in Tables Ap. 2-2 and Ap. 2-3 may be amended from time to time in accordance with the provisions set forth under Section 8 (*Extraordinary Events*) of these Rules.

For the avoidance of doubt, if on any Rebalancing Date, Constituents in the Basket are to be substituted by New Constituents, any references in the Weighting Algorithm performed on the Rebalancing Observation Date immediately preceding such Rebalancing Date to Constituent i or Constituent j shall be deemed to be to the New Constituents.

Ap.2.5 JPMorgan Optimax Plus Index Value Calculation

The Optimax Plus Index was first calculated on 6th May 2008 (the *First Optimax Valuation Day*) with a starting value of 100:

$$\text{CMDTOPER}(t_0) = 100$$

In accordance with the formulae below, the JPMorgan Optimax Plus Index Value (henceforth the *Optimax Plus Index Value*) on the zero-th Rebalancing Date (RD_0 = 24th April 2008) is defined as:

$$\text{CMDTOPER}(RD_0) = 100.0027$$

At the close of each Optimax Valuation Day t (the *Relevant Optimax Valuation Day*) the Optimax Plus Index Value shall be calculated by the Optimax Calculation Agent in accordance with the following formula:

$$\text{CMDTOPER}(t) = \text{CMDTOPER}(RD_{n-1}) \times \left[1 + \sum_{i \in AC} RW_i(RD_{n-1}) \times \left(\frac{\text{Level}_i(t)}{\text{Level}_i(RD_{n-1})} - 1\right)\right] \times (1 - RAF_t)$$

Where:

$\text{CMDTOPER}(t)$	is the Optimax Plus Index Value on the Relevant Optimax Valuation Day.
n	is the number of Rebalancing Dates from, and including, the zero-th Rebalancing Date to, and including, RD_{n-1}.
RD_{n-1}	is the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
$\text{Level}_i(t)$	is the USD Level of Constituent i at the close of the Relevant Optimax Valuation Day t.
$\text{Level}_i(RD_{n-1})$	is the USD Level of Constituent i at the close of the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
$RW_i(RD_{n-1})$	is the Rebalancing Weight of the Constituent i implemented at the close of the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day.
RAF_t	is defined in Annex 1
$\text{CMDTOPER}(RD_{n-1})$	is the Optimax Plus Index Value on the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day, rounded to 4 decimal places.

For the avoidance of doubt on each Rebalancing Date RD_n the Optimax Plus Index Value shall be defined as follows:

$$\text{CMDTOPER}(RD_n) = \text{CMDTOPER}(RD_{n-1}) \times \left[1 + \sum_{i \in AC} RW_i(RD_{n-1}) \times \left(\frac{\text{Level}_i(RD_n)}{\text{Level}_i(RD_{n-1})} - 1\right)\right] \times (1 - RAF_t)$$

Where:

$\text{Level}_i(RD_n)$	is the USD Level of Constituent i at the close of RD_n

* The above calculations include the Optimax Replication Adjustment Factor, which is deducted from the Optimax Plus Index Value on each Optimax Valuation Day at a rate of 96 basis points per annum on an actual/360 basis, and the specific calculation of which is expressed in Annex 1.

Notwithstanding the forgoing formulae, the Optimax Plus Index Value shall never fall below zero. In the case that the forgoing formulae would determine a negative value, the Optimax Plus Index Value shall be defined to be zero.

Ap.2.6 Publication of the Optimax Plus Index Value

The Optimax Plus Index Value will be published on the Bloomberg® ticker CMDTOPER provided that, as described in paragraph 7.3 (*Optimax Valuation Day*) of these Rules, the Optimax Calculation Agent shall not be obliged to publish the Optimax Plus Index Value for any day which is a Disrupted Day in respect of any Constituent. The Optimax Plus Index Value will be reported to four (4) decimal places (although the Optimax Calculation Agent may maintain a record of the Optimax Plus Index Value with greater precision for internal purposes) on every Optimax Valuation Day. For the avoidance of doubt, the Optimax Calculation Agent will be under no obligation to any person to provide the Optimax Plus Index Value by any alternative method if CMDTOPER is subject to any delay in or interruptions of publication or any act of God, act of governmental authority, or act of public enemy, or due to war, the outbreak or escalation of hostilities, fire, flood, civil commotion, insurrection, labour difficulty including, without limitation, any strike, other work stoppage, or slow-down, severe or adverse weather conditions, power failure, communications line or other technological failure may occur or any other event beyond the control of the Optimax Calculation Agent.

Ap.2.7 Additional Risk Factors specific to the Optimax Plus Index

In addition to the general risk factors set out in Annex 4 of these Rules, the following risk factors are all relevant to the Optimax Plus Index:

Ap.2.7.1 The use of a "long-short strategy"

The Optimax Plus Index employs a technique generally known as "long-short" strategy. This means the Optimax Plus Index could include a number of notional long positions and a number of notional short positions. Unlike long positions, short positions are theoretically subject to unlimited risk of loss because there is no limit on the amount by which the price of the relevant asset may appreciate before the short position is closed. The Optimax Plus Index may engage in notional short positions in accordance with the Optimax Plus Index Calculation Algorithms set out in this Appendix and it is therefore possible that during the time from, but excluding, one Rebalancing Date to, and including, the next following Rebalancing Date any notional short position included in the Optimax Plus Index may appreciate substantially with an adverse impact on the Optimax Plus Index Value.

Also, due to the short positions the Optimax Plus Index Value could potentially fall to zero without any of the Constituents falling to zero.

Ap.2.7.2 Use of Leverage

The Optimax Plus Index allows the sum of the absolute values of the Rebalancing Weights to exceed 100% (limited to 250% by the Gross Weight Constraint described in Section Ap.2.2.1.3). This is described as leverage.

The maximum of the sum of the positive Rebalancing Weights is effectively constrained to be 175% by the combined effect of the Gross Weight Constraint and the Net Weight Constraint. This sum is so constrained, since if the sum were greater than 175%, the sum of the negative Rebalancing Weights would have to be less than -75% (in order to satisfy the Net Weight Constraint) leading to a Gross Weight greater than 250%, which would violate the Gross Weight Constraint. Similarly the minimum of the sum of the negative Rebalancing Weights is effectively constrained to be -175%. These effective constraints are subject to the caveats described in An.4.7 Satisfaction of Constraints.

The Optimax Plus Index Value could potentially change by a greater percentage than the percentage change in any of the Constituents over a given period of time. For example, it might be that the Rebalancing Weights

included a total of 125% from the Long Leg (as defined below) and -125% from the Short Leg (as defined below) and that the USD Levels of all Constituents in the Long Leg went down by 5% and the USD Levels of all Constituents in the Short Leg went up by 5%, leading to the Optimax Plus Index Value going down by 12.5%. Here the Short Leg means the set of Constituents which have been given negative Rebalancing Weights, and the Long Leg means the set of Constituents which have been given positive Rebalancing Weights.

Also, due to the leverage the Optimax Plus Index Value could potentially fall to zero without any of the Constituents falling to zero.

Ap.2.7.3 Diversification of Sectors

It is generally considered that diversification among sectors within an asset class may reduce the volatility of a portfolio since the correlation between sectors is generally lower than between assets in the same sector (where a sector is a conventional grouping of Constituents of a similar nature or use, such as Industrial Metals or Energy). The Optimax Plus Index does not include any Constraint on sector diversification. This means that the net exposure to a single sector is limited only indirectly by the Constraints.

Although the rules for the Optimax Plus Index do not define sectors, it is possible that at any time the Rebalancing Weights of the Optimax Plus Index may be significantly greater for the Constituents that the market generally regards as belonging to a particular sector than for the Constituents that the market generally regards as belonging to other sectors. In such circumstances, a change in the USD Level for such Constituents may significantly outweigh the effect of a change in the USD Level of the Constituents belonging to other sectors. For example, there are six Constituents which are generally regarded as belonging to the energy sector (WTI Crude Oil, Brent Crude, Natural Gas, Gas Oil, Heating Oil and ULR Gasoline). The Rebalancing Weight for each of these Constituents may be as high as 25% (or as low as -25%) resulting in a total weight among such Constituents of 150% (or -150%) as determined by the Asset Weight Constraint. In this case a change in USD Level of each Constituent in the energy sector of, for example, 10% could impact the Optimax Plus Index Level by 15% either positively or negatively.

It is possible that at any time the Rebalancing Weights of the Optimax Plus Index shall be non-zero for Constituents from a single sector and zero for all Constituents from other sectors. In this case, for any potential losses due to changes in the USD Levels of Constituents with non-zero Rebalancing Weights there is no possibility that there might be offsetting gains due to changes in the USD Levels of Constituents from other sectors.

Ap.2.7.4 Level of VolCap

Generally, volatility measures the variability of returns of an asset and in some sense provides a measure of the risk of holding that asset.

The Optimax Plus Index targets a volatility of 12% (the VolCap). In addition to the risk factor described in An.4.5 , it should be noted that the level of VolCap might be considered high in relation to the historical realised volatility of certain other assets.

Annex 1 Replication Adjustment Factor Calculation

An.1.1 Replication Adjustment Factor Calculation

On each Optimax Valuation Day, the Replication Adjustment Factor (the *Optimax Replication Adjustment Factor*) is defined as:

$$\mathrm{RAF}_t = 1 - \left(1 - \frac{0.96}{100}\right)^{\frac{\text{CalendarDays}}{360}}$$

Where:

Calendar Days	is the number of calendar days from, and including, the Rebalancing Date immediately preceding the Relevant Optimax Valuation Day to, but excluding, the Relevant Optimax Valuation Day.

Annex 2 The functions Round(*x*,*y*) and RoundDown(*x*,*y*)

Round(*x*,*y*) shall be the function that rounds the decimal number *x* to the y^{th} digit after the decimal place, as illustrated in Table An.2 - 1: Round(*x*,*y*) below, rounding to the nearest available number. Where the last (non-zero) digit of *x* is a 5 and is at the $(y+1)^{th}$ decimal place, *x* shall be rounded up in the case that *x* is positive, and down in the case that *x* is negative.

x	*y*	Round(*x*,*y*)
0.1234567	3	0.123
0.1234567	4	0.1235
0.1234567	5	0.12346
0.1234567	6	0.123457
-0.15	1	-0.2
-0.05	1	-0.1
0.05	1	0.1
0.15	1	0.2

Table An.2 - 1: Round(*x*,*y*)

RoundDown(*x*, *y*) shall be the function that rounds down (in magnitude) the decimal number *x* to the y^{th} digit after the decimal place, i.e. RoundDown(*x*, *y*) is the unique number that i) has no (non-zero) digits after the y^{th} decimal place and ii) has the same sign as x (or is zero) and iii) has the greatest possible magnitude (given the foregoing) not exceeding the magnitude of *x*. RoundDown(*x*, *y*) is illustrated in Table An.2 - 2: RoundDown(*x*, *y*) below.

x	*y*	RoundDown(*x*,*y*)
0.1234567	3	0.123
0.1234567	4	0.1234
0.1234567	5	0.12345
0.1234567	6	0.123456
-0.15	1	-0.1
-0.05	1	0
0.05	1	0
0.15	1	0.1

Table An.2 - 2: RoundDown(*x*, *y*)

Annex 3 Definitions

Terms not otherwise defined in this document shall have the following meanings:

"AC"	means the set of all Constituents;
"**Constituent**"	means a constituent of Optimax as described in the relevant Appendix of these Rules;
"Constituent Publication Day"	means each day for which the Index Sponsor has published the USD Level of at least half of the Constituents;
"Constraint" or "Constraints"	means, the Allocation Constraints, Short-Term Volatility Constraint and Long-Term Volatility Constraint (individually or collectively as the context requires);
"Dealing Day"	means each day (other than a Saturday or a Sunday) (i) on which commercial banks in both New York and London are open generally for business (including for dealings in foreign exchange and foreign currency deposits), and (ii) which is a Scheduled Trading Day for all the Constituents of Optimax;
"**Disrupted Day**"	means, in respect of any Constituent, a day on which a Market Disruption Event occurs or exists for such Constituent;
"Exchange"	means, in respect of any Constituent, any exchange on which futures or options contracts relating to that Constituent are traded;
"**Hedge Disruption Event**"	means, in relation to a Constituent of Optimax: (a) due to: (i): the adoption of, or any change in, any applicable law, regulation or rule (including, without limitation, any tax law); or (ii) the promulgation of, or any change in, the interpretation by any court, tribunal or regulatory authority with competent jurisdiction of any applicable law, rule, regulation or order (including, without limitation, as implemented by the U.S. Commodity and Futures Trading Commission or exchange or trading facility), in each case on or after the date of these Rules, the Optimax Calculation Agent determines in good faith that (x) it is contrary to such law, rule, regulation or order for a market participant or market participants (individually or collectively) to hold, acquire or dispose of (in whole or in part) any commodity futures contracts underlying such Constituent or any transaction referencing commodity futures contracts underlying such Constituent or, (y) holding a position in any commodity futures contracts underlying such Constituent or any transaction referencing any commodity futures contracts underlying such Constituent is (or, but for the consequent disposal or

termination thereof, would otherwise be) in excess of any allowable position limit(s) applicable to a market participant or market participants (individually or collectively) under any such law, rule, regulation in relation to any commodity futures contracts underlying such Constituent traded on any exchange(s) or other trading facility (including, without limitation, any Relevant Exchange);

(b) the occurrence or existence of:

(i) any suspension or limitation imposed on trading commodity futures contracts underlying such Constituent, whether imposed by any Relevant Exchange or otherwise;

(ii) any other event that materially disrupts or impairs the liquidity of any commodity futures contracts underlying such Constituent or the ability of any market participants (individually or collectively) to effect transactions in any commodity futures contracts underlying such Constituent or causes (or will cause) trading in any commodity futures contracts underlying such Constituent to cease; or

(c) the Optimax Calculation Agent determines in good faith that any market participants (individually or collectively) are, for any reason, unable, after using commercially reasonable efforts to:

(i) acquire, establish, re-establish, substitute, maintain, unwind or dispose of any position in commodity futures contracts underlying such Constituent or any transaction(s) referencing commodity futures contracts underlying such Constituent that a market participant or market participants (individually or collectively) deem necessary to hedge the price risk of entering into and performing its or their obligations under any transaction; or

(ii) realise, recover or remit the proceeds of any such position(s) or transaction(s).

"**Index Sponsor**" means, in respect of a Constituent, the corporation or other entity that (a) is responsible for setting and reviewing the rules and procedures and the methods of calculation and adjustments, if any, related to such Constituent and (b) announces (directly or through an agent) the USD Level of such Constituent on a regular basis (as of the date of these Rules, the Index Sponsor is Standard & Poor's);

"**Limit Day**" means, in respect of a Constituent, any day on which there is a limitation on, or suspension of, the trading of options or futures contracts on the related commodity imposed by any

	relevant Exchange by reason of movements exceeding "limit up" or "limit down" levels permitted by such Exchange and which, in the opinion of the Optimax Calculation Agent, is material taking into account generally prevailing trading volumes and other market conditions;
"**Market Disruption Event**"	means, in respect of a Constituent and a Dealing Day, the failure by the relevant Index Sponsor to calculate and publish the USD Level for such Constituent;
"Optimax"	means the Optimax family of indices collectively as described in these Rules or the relevant Optimax index, including the relevant Appendix of these Rules, as the circumstances may require;
"**Optimax Calculation Agent**"	has the meaning given to such term in paragraph 3 (*Optimax Calculation Agent*) of these Rules;
"**Optimax Index Value**"	means the Optimax Index Value in respect of the Optimax index set out in the relevant Appendix, determined in accordance with the relevant Appendix and Annex 1 (*Replication Adjustment Factor Calculation*);
"Optimax Replication Adjustment Factor"	has the meaning given to such term in paragraph 4.2 (*Calculation Method*) of these Rules;
"**Optimax Valuation Day**"	has the meaning given to such term in paragraph 4.1 (*Calculation Timeline*) of these Rules;
"Rebalancing Date"	means (subject to the occurrence of a Market Disruption Event) the Dealing Day of every month specified in the relevant Appendix; *provided, however* that if the Optimax Calculation Agent has declared a Hedge Disruption Event and has specified an interim Rebalancing Date, there will be an additional Rebalancing Date which will be the Dealing Day determined by the Optimax Calculation Agent in its sole and absolute discretion. Rebalancing will take effect immediately following the close of such Rebalancing Date;
"Rebalancing Observation Date"	means the sixteenth Dealing Day of every month; *provided, however* that if the Optimax Calculation Agent has declared a Hedge Disruption Event and has specified an interim Rebalancing Date, there will be an additional Rebalancing Observation Date which will be the Dealing Day determined by the Optimax Calculation Agent in its sole and absolute discretion;
"Relevant Observation Period"	means, in respect of the Rebalancing Observation Date, the chronologically ordered set of the preceding 253 Constituent Publication Days, up to and including the Rebalancing Observation Date. For the avoidance of doubt, in the case that a Rebalancing Observation Date fails to be a Constituent Publication Date, the Relevant Observation Period will still consist of 253 days, being those 253 Constituent Publication Days most recently preceding the Rebalancing Observation Date for which are not Disrupted Days for at least half of all Constituents;

"PI"	means the mathematical constant π, which for the purposes of the Weighting Algorithm shall take the value 3.14159265358979;
"**Rules**"	means the rules of Optimax as set out in this document (including the relevant Appendix and the Annexes), as the same may be amended, supplemented and/or restated from time to time;
"Scheduled Trading Day"	means, in respect of a Constituent, a day on which the relevant Index Sponsor is scheduled to publish the USD Level of such Constituent and the principal exchange for futures and options contracts on such Constituent is scheduled to be open for trading for its regular trading session;
"Sector"	means one of the sets of Constituents described in the relevant Appendix;
"**Successor Constituent**"	has the meaning given to such term in paragraph 8.1 (*Successor Constituent*) of these Rules;
Table An.x – y	means the table y in Annex x;
Table Ap.x – y	means the table y in Appendix x;
"**USD**"	means the lawful currency of the United States of America; and
"**USD Level**"	means, in respect of a Constituent i, a) for the purpose of calculating the Optimax Index Value: (i) the closing level of such Constituent i as calculated and published by the relevant Index Sponsor on the Relevant Optimax Valuation Day or Rebalancing Date, or (ii) in the event of circumstances set out in paragraph 7.2 of these Rules, the level on such Relevant Optimax Valuation Day or Rebalancing Date as reasonably calculated and published by the Optimax Calculation Agent, or (iii) in the event of circumstances set out in paragraph 8.1 of these Rules, the level on such Relevant Optimax Valuation Day or Rebalancing Date as calculated and published by the sponsor of the relevant Successor Constituent; and b) for the purpose of determining the Rebalancing Weights via the Weighting Algorithm: (i) the closing level of such Constituent as calculated and published by the relevant Index Sponsor on such Constituent Publication Day, or (ii) in the event of circumstances set out in paragraph 7.1 of these Rules, the closing level of such Constituent on the latest preceding day for which the relevant Index Sponsor has calculated and published the USD Level for that Constituent, or (iii) in the event of the circumstances set out in paragraph 8.1 of these Rules, the level of the Constituent on such Constituent Publication Day as calculated and published by the sponsor of the relevant Successor Constituent.

Annex 4 Risk Factors

The following list of risk factors does not purport to be a complete enumeration or explanation of all the risks associated with Optimax and should be read in conjunction with the relevant Appendix**.**

An.4.1 Lack of operating history

Optimax is only recently established and therefore has no history to evaluate its likely performance.

Any back-testing or similar analysis performed by any person in respect of Optimax must be considered illustrative only and may be based on estimates or assumptions not used by the Optimax Calculation Agent when determining the Optimax Index Values pursuant to these Rules.

Further, the past performance of an Optimax index should not be used as a guide to future performance of that Optimax index.

An.4.2 Synthetic Exposure to Commodities

The returns of the Constituents are calculated on an uncollateralised basis with full reinvestment. Each Constituent reflects a long position in the relevant commodity future(s). Unlike a passive equity portfolio, the commodity future(s) underlying the Constituents are rolled before maturity into longer dated contracts. They need to be rolled because although the commodity future(s) underlying the Constituents have specific maturities, the Constituents themselves have an indefinite life. Generally the commodity futures underlying the Constituents, will be the nearby futures contract (as defined by the Index Sponsor in the S&P GSCI index rules) and will be rolled on a monthly basis, except for some commodities (e.g. agricultural products) for which only a few future contracts months each year trade with sufficient liquidity.

Rolling the commodity futures underlying the Constituents will generate a profit or a loss known as the roll return that will be reflected in the USD Level of the Constituents. This roll return will be affected by a number of factors including, without limitation, whether the prices of the relevant longer dated contracts are higher or lower than the prices of the shorter dated contracts. It has to be noted that the risk of aberrational liquidity or pricing around the maturity date of a commodity futures contract is greater than in the case of other futures contracts because (amongst other factors) a number of market participants take delivery of the underlying commodities.

Prices for commodities are affected by a variety of factors, including, without limitation, changes in supply and demand relationships, governmental programmes and policies, national and international political and economic events, wars and acts of terror, changes in interest and exchange rates, trading and speculative activities in commodities and related contracts, weather, and agricultural, trade, fiscal, monetary and exchange control policies. The price volatility of each commodity also affects the value of the futures and forward contracts related to that commodity and therefore its price at any such time. The price of any one commodity may be correlated to a greater or lesser degree with any other commodity and factors affecting the general supply and demand as well as the prices of other commodities may affect the particular commodity in question. It should be noted that in respect of commodities in the energy sector, due to the significant level of its continuous consumption, limited reserves, and oil cartel controls, energy prices are subject to rapid price increases in the event of perceived or actual shortages. These factors (when combined or in isolation) may affect the price of futures contracts and, as a consequence, the performance of the Constituents and the Optimax Index Value.

The commodities markets are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of financial investors, speculators and government regulation and intervention. These circumstances could adversely affect the price of futures contracts and, therefore, the performance of the Constituents and the Optimax Index Value.

An.4.3 Investment Strategy on which Optimax is based

Optimax is constructed using what is generally known as a momentum investment strategy, subject to certain Constraints. The assumption is that if certain assets performed well in the past they will continue to perform well in the future and if they performed poorly in the past they will continue to do so. This theory influences the Constituent Predicted Returns which are in turn used by the Weighting Algorithm to determine the Rebalancing Weight to be assigned to each Constituent (which may be positive, negative or zero). However, no assurance can be given that the theory used to determine the Constituent Predicted Returns will be effective.

No assurance can be given that the investment strategy used to construct Optimax will be successful or that Optimax will outperform any alternative portfolio that might be constructed from the Constituents.

Furthermore, it should be noted that the results that may be obtained from investing in any security or investment or otherwise participating in any transaction linked to Optimax might well be significantly different from the results that could theoretically be obtained from an investment in the Constituents, or the futures contracts underlying the Constituents or the physical commodities underlying the Constituents or any related derivatives. Such differences may arise for a number of reasons including, but not limited to, the Replication Adjustment Factor (if any) deducted from the Optimax Index Values.

An.4.4 Estimation of Returns

The Constituent Predicted Returns are notional predicted returns based on the assumption that the returns of the Constituents over the last 12-month period will have some predictive power regarding future returns. For Seasonal Constituents only, the returns of the first and last 3 months will be overweighted in comparison to the other 6 months of the 12-month period. There is no guarantee that the past returns of Constituents will be repeated in the future.

The Weighting Algorithm seeks to find the highest value of the Estimated Portfolio Return, subject to the Constraints. The Estimated Portfolio Return is based on the past returns of the Constituents and may not resemble the actual return realised by Optimax which is likely to be significantly less.

Past returns are not indicative of future returns.

An.4.5 Estimation of Volatility

The Short Term Volatility and Long Term Volatility are not a guarantee of the actual volatility which will be realised by the relevant Optimax index. Both figures are calculated on the basis of past volatilities and correlations of the Constituents and are used only as guides to the composition and total size of exposure to the Constituents. There is no guarantee that past volatilities and correlations of the Constituents will offer a good prediction of future volatilities and correlations of the Constituents.

In particular, due to the nature of the Weighting Algorithm, Rebalancing Weights will be chosen to fit the profile of volatilities and correlations of the Constituents exhibited over the past 63 Constituent Publication Days (approximately three months). In addition to variations in levels of volatility across all Constituents from time to time, variations in the relative volatilities of Constituents and in the correlations between each pair of Constituents will mean that the volatility of the relevant Optimax index may be more likely than not to exceed the relevant Volatility Cap.

An.4.6 The Weighting Algorithm

The Weighting Algorithm of each Optimax index is designed to seek the Rebalancing Weights that maximise the Estimated Portfolio Return subject to the Constraints. However, no assurance is given that the Rebalancing Weights will maximise the Estimated Portfolio Return subject to the Constraints. Indeed it is possible that an alternative algorithm applied to the same inputs would achieve a portfolio which satisfied the Constraints with a greater Estimated Portfolio Return.

An.4.7 Satisfaction of Constraints

The Weighting Algorithm is designed to respect the Constraints when selecting the Rebalancing Weights. However, rounding may introduce a minor violation of any of the Constraints, with the exception of the Gross

Weight Constraint which shall be preserved by rounding all Rebalancing Weights down (where in the case of negative weights rounding down is rounding towards zero, tending to reduce the absolute size of the individual weights and hence the gross exposure). All other Constraints may be subject to minor violations due to rounding.

In addition, since Optimax is rebalanced on a monthly basis (assuming the Optimax Calculation Agent does not select an interim Rebalancing Date with respect to a Hedge Disruption Event), between Rebalancing Dates as the performance of the Constituents vary amongst themselves, the effective dollar weights will vary from the Rebalancing Weights assigned on the Rebalancing Date. The dollar weight of a Constituent at a given point in time is the size of the position in that Constituent as a percentage of the notional size of the relevant Optimax index. Thus, immediately following the Rebalancing Date, for 1 unit of the Optimax index the exposure to Constituent i is RW_i units (i.e. the dollar weight is equal to the Rebalancing Weight), but between Rebalancing Dates, as the return of Constituent i since the previous Rebalancing Date will in general be different to the return of the whole portfolio (i.e. the Optimax index), the exposure to Constituent i will be a different percentage of the notional value of the Optimax index (i.e. the dollar weight is no longer equal to the Rebalancing Weight). In this way any of the Constraints may be violated between Rebalancing Dates.

An.4.8 Diversification

There can be no assurance that Optimax will be sufficiently diversified at any time to reduce or minimize the risks or perceived risks associated with an investment in a portfolio of risky assets. In particular, as all Constituents of Optimax are indices based on futures contracts linked to commodities, Optimax is not diversified across asset classes. Moreover, subject to the Constraints, it is possible that the weight of each Constituent of the relevant Optimax index may be zero at a given point in time.

An.4.9 Optimax Calculation Agent Discretion

The Optimax Calculation Agent is entitled to exercise certain discretions in relation to Optimax, including but not limited to:

- the determination of whether a day is a Limit Day (as further described in the Limit Day definition),
- the determination of the USD Levels to be used when calculating the Optimax Index Values in the event that there are 10 consecutive Scheduled Trading Days which are either a Disrupted Day or a Limit Day for the same Constituent,
- the publication of Optimax Index Values if a day is a Disrupted Day for any Constituent,
- substitution or exclusion of Constituents in accordance with paragraph 8,
- existence of a Hedge Disruption Event and consequences of such event and
- the modification, interpretation and adjustment of these Rules.

Although the Optimax Calculation Agent will make all determinations and take all action in relation to Optimax acting in good faith, it should be noted that such discretion could have an impact, positive or negative, on the Optimax Index Values as well as on the Constituents of any Optimax index.

An.4.10 Potential Conflicts of Interest

Potential conflicts of interest may exist in the structure and operation of Optimax and the conduct of normal business activities by the Optimax Calculation Agent and any of its affiliates or subsidiaries or any of their respective directors, officers, employees, representatives, delegates or agents (each a *Relevant Person*). Please refer to the disclaimer in Annex 5 for more information.

An.4.11 Failure by the Index Sponsor to calculate and announce USD Level for a Constituent

If the Index Sponsor fails to calculate and announce the USD Level for a Constituent, this would generally have an impact on the Weighting Algorithm and on the Optimax Index Value calculation:

- in such case the Weighting Algorithm will use the latest preceding published USD Level for such Constituent provided that if more than half the Constituents are affected, such day will not be a Constituent Publication Day; and
- the Calculation Agent may either publish the Optimax Index Value retroactively or decide not to publish an Optimax Index Value for such Disrupted Day.

However, in the same situation, the Optimax Calculation Agent may also choose to remove such Constituent from the portfolio of Constituents. The Optimax Calculation Agent will generally only take this action if the Optimax Calculation Agent reasonably believes that the Index Sponsor will no longer publish a USD Level for such Constituent.

An.4.12 Publication of Optimax Index Value

An Optimax Index Value will always be published for an Optimax Valuation Day that is also a Limit Day (but not a Disrupted Day), provided that the value published in respect of such day will be calculated retroactively as described in paragraph 7.2. However, if an Optimax Valuation Day is a Disrupted Day, the Optimax Calculation Agent may or may not publish the Optimax Index Value, in accordance with paragraph 7.2.

An.4.13 Hedge Disruption Event

If a Hedge Disruption Event occurs, the Optimax Calculation Agent may remove Constituents. Such a removal may negatively affect the performance and the diversity of the synthetic portfolio, and therefore, affect the performance and realized volatility of the Optimax indices. Additionally, the Optimax Calculation Agent may replace an affected Constituent with a New Constituent. Such a substitution may change the correlations between Constituents or introduce a potentially riskier or less performing Constituent to the potential universe of constituents. Therefore, such a substitution may adversely affect the performance and realized volatility of the Optimax indices. Following the occurrence of a Hedge Disruption Event, the Optimax Calculation Agent may also decide to cancel any Optimax indices if it determines acting in good faith and a commercially reasonable manner that the objective of the relevant Optimax Index can no longer be achieved. Finally, the occurrence of a Hedge Disruption Event may also affect the Optimax indices in an unforeseen manner, and the indices may be affected by the risks described in this paragraph or other risks that are a result of a Hedge Disruption Event.

The foregoing list of risk factors, together with the additional risk factors in the relevant Appendix for each Optimax index, is not intended to be exhaustive. Anyone reading these Rules should seek such advice as they consider necessary from their professional advisors, legal, tax or otherwise, without reliance on any Relevant Person to satisfy themselves that they fully understand these Rules and the risks associated with Optimax and any particular Optimax index.

Annex 5 Notices, Disclaimers and Conflicts

An.5.1 Notices, Disclaimers and Conflicts

These Rules have been prepared solely for informational purposes and nothing herein constitutes an offer to buy or sell any securities, participate in any transaction or adopt any investment strategy or as legal, tax regulatory or accounting advice. The Rules are of the date specified above and may change at any time without prior notice.

Neither the Optimax Calculation Agent nor any of its affiliates or subsidiaries or their respective directors, officers, employees, representatives, delegates or agents (each a *Relevant Person*) make any representation or warranty, whatsoever, express or implied, as to the results that may be obtained through the use of these Rules or Optimax. Each Relevant Person hereby expressly disclaims, to the fullest extent permitted by law, all warranties of accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any information contained in this document and no Relevant Person shall have any liability (direct or indirect, special, punitive, consequential or otherwise) to any person even if notified of the possibility of any such damages.

The Optimax Calculation Agent is under no obligation to continue the calculation, publication and dissemination of any Optimax index or any Optimax Index Value.

During the course of their normal business, the Optimax Calculation Agent or any other Relevant Person may enter into or promote, offer or sell transactions or investments (structured or otherwise) linked to Optimax and/or any of the Constituents. In addition, any Relevant Person may have, or may have had, interests or positions, or may buy, sell or otherwise trade positions in or relating to Optimax or any of the Constituents, or may invest or engage in transactions with other persons, or on behalf of such persons relating to any of these items. Such activity may or may not have an impact on the Optimax Index Values but all persons reading these Rules should be aware that a conflict of interest could arise where anyone is acting in more than one capacity. Neither the Optimax Calculation Agent nor any other Relevant Person has any duty to consider the circumstances of any person when participating in such transactions or to conduct themselves in a manner that is favourable to any person.

It should be noted that the Rules have been developed with the possibility of the Optimax Calculation Agent or any of the Relevant Persons entering into or promoting, offering or selling transactions or investments (structured or otherwise) linked to Optimax, and hedging the obligations that might arise under any such transactions or investments. Accordingly it should be assumed that these Rules have and will be analyzed from this point of view.

As mentioned above, it should be noted that Optimax is described as a notional portfolio of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. Optimax merely identifies certain assets in the market, the performance of which will be used as a reference point for the purposes of calculating the Optimax Index Values.

Also as mentioned above, it should be noted that a Replication Adjustment Factor will be deducted on each Optimax Valuation Day from the Optimax Index Value at a rate of ninety-six basis points (0.96%) per annum (the *Optimax Replication Adjustment Factor*).

There is no obligation upon the Optimax Calculation Agent to publish the Optimax Index Values by any alternative method if the relevant Bloomberg ticker (as identified in the relevant Appendix) is subject to any delay in or interruptions of publication or any act of God, act of governmental authority, or act of public enemy, or due to war, the outbreak or escalation of hostilities, fire, flood, civil commotion, insurrection, labour difficulty including, without limitation, any strike, other work stoppage, or slow-down, severe or adverse weather conditions, power failure, communications line or other technological failure may occur or any other event beyond the control of the Optimax Calculation Agent.

No one may reproduce or disseminate the information contained in these Rules or the Optimax Index Values without the prior written consent of the Optimax Calculation Agent. JPMorgan Optimax is the intellectual property of the Optimax Calculation Agent and may only be used (as an underlying for financial products or otherwise) by third parties who have entered into a license agreement with the Optimax Calculation Agent.

These Rules are not intended for distribution to, or use by any person in, a jurisdiction where such distribution is prohibited by law or regulation.

These Rules shall be governed by and construed in accordance with the laws of England.

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