

J.P. MORGAN MARKETS PRINCIPAL TRADING
COSTS & CHARGES EX-ANTE DISCLOSURE

Table of contents

1. Purpose	1
2. What are the costs involved in transacting in the financial instruments covered by this disclosure?	2
Costs related to transactions	2
Ongoing charges	3
One-off charges	3
Incidental costs	3
Third party payments	3
Foreign Currency Costs	3
3. Illustrations of costs and charges applicable to the financial instruments covered by this disclosure	4
Costs related to transactions - Transaction Costs	4
Ongoing charges	6
Ex post disclosures	7

1. Purpose

Principal Trading ex-ante disclosure*

This document provides the client with important information about costs and charges relating to certain financial instruments as required under Article 24(4) of the Markets in Financial Instruments Directive II (MiFID II). The information is required by law to help the client understand the costs and charges associated with transacting in certain financial instruments and is not marketing material.

Financial Instruments

The financial instruments covered by this disclosure are traded by J.P. Morgan on a principal basis.

The financial instruments include:

- i. Bonds
- ii. Interest rate derivatives
- iii. Foreign exchange derivatives
- iv. Equity derivatives
- v. Commodity derivatives
- vi. Credit derivatives
- vii. Securitised derivatives
- viii. Exchange Traded Funds

*MIFID II For purposes of United Kingdom Regulation shall mean Directive 2014/65 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments as it forms part of 'retained EU law' as defined in the European Union (Withdrawal) Act 2018 (as amended from time to time) and for European Union Regulation shall mean Directive 2014/65 of the European Parliament and the Council of 15 May 2014 (as amended or updated from time to time).

2. What are the costs involved in transacting in the financial instruments covered by this disclosure?

Costs related to transactions

Some financial instruments may involve transaction costs. These are costs and charges incurred as a result of the acquisition or disposal of the relevant financial instrument and include the costs clients incur when conducting a transaction to create, increase or decrease a position.

The transaction costs payable when executing a transaction in one of the financial instruments covered by this disclosure are considered to be the difference between the price at which the client executes the transaction with J.P. Morgan and the client neutral mid-market price (such difference the "Transaction Cost") at the time of the transaction. The Transaction Cost is embedded in the transaction price paid by the client.

The Transaction Cost covers JP Morgan's fixed and variable operating costs and its size is influenced by factors that include, but are not limited to:

- Type of financial instrument;
- Liquidity of the financial instrument in the market;
- Whether J.P. Morgan is a market maker in the financial instrument;
- Time, effort, cost and potential risk to J.P. Morgan of executing the transaction;
- The level of standardisation of the product;
- Transaction size;
- Credit risk;
- Market risk;
- Capital usage.

The client neutral mid-market price at the time of the transaction will be based on, but not limited to, the following:

- Current executable market price at or around the time of the trade not directed at a particular client or class of clients;
- Recent transactions in the same instrument undertaken by J.P. Morgan;
- Similar transactions entered into or reported at that time by other market participants;
- Mid-market price as determined by an internal J.P. Morgan model.

Ongoing charges

Some financial instruments may involve ongoing charges. These are the ongoing costs and charges incurred by the client and paid to J.P. Morgan either directly or indirectly through the performance of the financial instrument as a result of holding the position for a period of time. The amount will vary from product to product and from time to time.

One-off charges

Some financial instruments may involve one-off charges. These are costs and charges paid at the beginning or at the end of the investment in the financial instrument. For the financial instruments covered under this disclosure there are no one-off charges.

Incidental costs

Some financial instruments may involve incidental costs. These are costs that are incidental to the investment in the financial instrument. For the financial instruments covered under this disclosure there are no incidental costs.

Third party payments

For the purposes of disclosing costs and associated charges charged by J.P. Morgan, or other parties where the client has been directed to such other parties, for investment and ancillary services provided to the client, J.P. Morgan is required to itemise any third party payments received by J.P. Morgan in connection with any investment service provided.

In respect of the financial instruments covered by this disclosure, J.P. Morgan does not expect to receive any such third party payments; however, should this be the case these may be disclosed to the client separately prior to the relevant service being provided and may be disclosed to the client in their annual ex post costs and charges disclosure.

Foreign Currency Costs

If any costs and charges are paid in foreign currency, the ex-post disclosure will provide an indication of the currency involved and the applicable currency conversion rates and cost. As agreed with the client in J.P. Morgan's general terms of business, J.P. Morgan's ex ante disclosure does not include this information.

3. Illustrations of costs and charges applicable to the financial instruments covered by this disclosure

Examples of costs and charges for the financial instruments covered by this disclosure are shown below. Although these examples are based on actually incurred costs (or reasonable estimations of such costs) as a proxy for expected costs and charges, actual costs and charges incurred in respect of any future transaction may be different.

As agreed with you in J.P. Morgan's general terms of business, J.P. Morgan's ex ante and ex post disclosures will not show the cumulative effect of costs on return.

Costs related to transactions - Transaction Costs

The tables below illustrate the Transaction Costs for the financial instruments covered by this disclosure.

The financial instruments covered under this disclosure may be traded according to different quoting conventions which include, but are not limited to:

- Basis Points - For financial instruments that can be traded as a yield, spread or interest rate;
- Volatility percentage points – For financial instruments that can be traded as a volatility spread;
- % of Notional or Premium – For financial instruments that can be traded as a % of a given notional or cash premium.

In the examples below notional can be constructed in a variety of different ways that include, but are not limited to, notional in currency terms, vega notional and financial instrument contract size multiplied by the number of contracts. As noted above the Transaction Costs are driven by a number of factors which include but are not limited to:

- Type of financial instrument;
- Liquidity of the financial instrument in the market;
- Whether J.P. Morgan is a market maker in the financial instrument;
- Time, effort, cost and potential risk to J.P. Morgan of executing the transaction;
- The level of standardisation of the product;
- Transaction size;
- Credit risk;
- Market risk;
- Capital usage

Basis Points – Yield, spread or interest rate

The tables below illustrate the Transaction Costs for a notional of \$10,000,000:

Transaction Costs (\$ USD)	Duration (Years)													
	0.0027		0.0833		0.5		1		2		5		10	
	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional
0	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%
0.025	0	0.0000%	2	0.0000%	13	0.0001%	25	0.0003%	50	0.0005%	125	0.0013%	250	0.0025%
0.050	0	0.0000%	4	0.0000%	25	0.0003%	50	0.0005%	100	0.0010%	250	0.0025%	500	0.0050%
0.125	0	0.0000%	10	0.0001%	63	0.0006%	125	0.0013%	250	0.0025%	625	0.0063%	1,250	0.0125%
0.250	1	0.0000%	21	0.0002%	125	0.0013%	250	0.0025%	500	0.0050%	1,250	0.0125%	2,500	0.0250%
0.500	1	0.0000%	42	0.0004%	250	0.0025%	500	0.0050%	1,000	0.0100%	2,500	0.0250%	5,000	0.0500%
1.00	3	0.0000%	83	0.0008%	500	0.0050%	1,000	0.0100%	2,000	0.0200%	5,000	0.0500%	10,000	0.1000%
1.500	4	0.0000%	125	0.0012%	750	0.0075%	1,500	0.0150%	3,000	0.0300%	7,500	0.0750%	15,000	0.1500%
2.00	5	0.0001%	167	0.0017%	1,000	0.0100%	2,000	0.0200%	4,000	0.0400%	10,000	0.1000%	20,000	0.2000%
2.50	7	0.0001%	208	0.0021%	1,250	0.0125%	2,500	0.0250%	5,000	0.0500%	12,500	0.1250%	25,000	0.2500%
Transaction Costs (Basis Points)	14	0.0001%	417	0.0042%	2,500	0.0250%	5,000	0.0500%	10,000	0.1000%	25,000	0.2500%	50,000	0.5000%
7.50	20	0.0002%	625	0.0062%	3,750	0.0375%	7,500	0.0750%	15,000	0.1500%	37,500	0.3750%	75,000	0.7500%
10.00	27	0.0003%	833	0.0083%	5,000	0.0500%	10,000	0.1000%	20,000	0.2000%	50,000	0.5000%	100,000	1.0000%
12.50	34	0.0003%	1,041	0.0104%	6,250	0.0625%	12,500	0.1250%	25,000	0.2500%	62,500	0.6250%	125,000	1.2500%
25.00	68	0.0007%	2,083	0.0208%	12,500	0.1250%	25,000	0.2500%	50,000	0.5000%	125,000	1.2500%	250,000	2.5000%
37.50	101	0.0010%	3,124	0.0312%	18,750	0.1875%	37,500	0.3750%	75,000	0.7500%	187,500	1.8750%	375,000	3.7500%
50.00	135	0.0014%	4,165	0.0417%	25,000	0.2500%	50,000	0.5000%	100,000	1.0000%	250,000	2.5000%	500,000	5.0000%
75.00	203	0.0020%	6,248	0.0625%	37,500	0.3750%	75,000	0.7500%	150,000	1.5000%	375,000	3.7500%	750,000	7.5000%
100.00	270	0.0027%	8,330	0.0833%	50,000	0.5000%	100,000	1.0000%	200,000	2.0000%	500,000	5.0000%	1,000,000	10.0000%
125.00	338	0.0034%	10,413	0.1041%	62,500	0.6250%	125,000	1.2500%	250,000	2.5000%	625,000	6.2500%	1,250,000	12.5000%
150.00	405	0.0041%	12,495	0.1250%	75,000	0.7500%	150,000	1.5000%	300,000	3.0000%	750,000	7.5000%	1,500,000	15.0000%
200.00	540	0.0054%	16,660	0.1666%	100,000	1.0000%	200,000	2.0000%	400,000	4.0000%	1,000,000	10.0000%	2,000,000	20.0000%
250.00	675	0.0068%	20,825	0.2083%	125,000	1.2500%	250,000	2.5000%	500,000	5.0000%	1,250,000	12.5000%		

Transaction Costs (\$ USD)	Duration (Years)											
	15		20		25		30		40		50	
	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional
0	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%	-	0.0000%
0.025	375	0.0038%	500	0.0050%	625	0.0063%	750	0.0075%	1,000	0.0100%	1,250	0.0125%
0.05	750	0.0075%	1,000	0.0100%	1,250	0.0125%	1,500	0.0150%	2,000	0.0200%	2,500	0.0250%
0.125	1,875	0.0188%	2,500	0.0250%	3,125	0.0313%	3,750	0.0375%	5,000	0.0500%	6,250	0.0625%
0.25	3,750	0.0375%	5,000	0.0500%	6,250	0.0625%	7,500	0.0750%	10,000	0.1000%	12,500	0.1250%
0.5	7,500	0.0750%	10,000	0.1000%	12,500	0.1250%	15,000	0.1500%	20,000	0.2000%	25,000	0.2500%
1	15,000	0.1500%	20,000	0.2000%	25,000	0.2500%	30,000	0.3000%	40,000	0.4000%	50,000	0.5000%
1.5	22,500	0.2250%	30,000	0.3000%	37,500	0.3750%	45,000	0.4500%	60,000	0.6000%	75,000	0.7500%
2	30,000	0.3000%	40,000	0.4000%	50,000	0.5000%	60,000	0.6000%	80,000	0.8000%	100,000	1.0000%
Transaction Costs (Basis Points)	37,500	0.3750%	50,000	0.5000%	62,500	0.6250%	75,000	0.7500%	100,000	1.0000%	125,000	1.2500%
5	75,000	0.7500%	100,000	1.0000%	125,000	1.2500%	150,000	1.5000%	200,000	2.0000%	250,000	2.5000%
7.5	112,500	1.1250%	150,000	1.5000%	187,500	1.8750%	225,000	2.2500%	300,000	3.0000%	375,000	3.7500%
10	150,000	1.5000%	200,000	2.0000%	250,000	2.5000%	300,000	3.0000%	400,000	4.0000%	500,000	5.0000%
12.5	187,500	1.8750%	250,000	2.5000%	312,500	3.1250%	375,000	3.7500%	500,000	5.0000%	625,000	6.2500%
25	375,000	3.7500%	500,000	5.0000%	625,000	6.2500%	750,000	7.5000%	1,000,000	10.0000%	1,250,000	12.5000%
37.5	562,500	5.6250%	750,000	7.5000%	937,500	9.3750%	1,125,000	11.2500%	1,500,000	15.0000%	1,875,000	18.7500%
50	750,000	7.5000%	1,000,000	10.0000%	1,250,000	12.5000%	1,500,000	15.0000%	2,000,000	20.0000%		
75	1,125,000	11.2500%	1,500,000	15.0000%	1,875,000	18.7500%						
100	1,500,000	15.0000%	2,000,000	20.0000%								
125	1,875,000	18.7500%										

Volatility percentage points

The tables below illustrate the Transaction Costs as a function of vega notional and volatility percentage points:

Transaction Costs (\$ USD)	Vega Notional (\$ USD)							
	50,000		100,000		150,000		200,000	
	Cost	% Notional	Cost	% Notional	Cost	% Notional	Cost	% Notional
0.075	3,750	7.50%	7,500	7.50%	11,250	7.50%	15,000	7.50%
0.100	5,000	10.00%	10,000	10.00%	15,000	10.00%	20,000	10.00%
0.125	6,250	12.50%	12,500	12.50%	18,750	12.50%	25,000	12.50%
0.150	7,500	15.00%	15,000	15.00%	22,500	15.00%	30,000	15.00%
0.200	10,000	20.00%	20,000	20.00%	30,000	20.00%	40,000	20.00%
Transaction Costs (Volatility Percentage Points)	12,500	25.00%	25,000	25.00%	37,500	25.00%	50,000	25.00%
0.250	18,750	37.50%	37,500	37.50%	56,250	37.50%	75,000	37.50%
0.375	25,000	50.00%	50,000	50.00%	75,000	50.00%	100,000	50.00%
0.50	37,500	75.00%	75,000	75.00%	112,500	75.00%	150,000	75.00%
0.75	50,000	100.00%	100,000	100.00%	150,000	100.00%	200,000	100.00%
1.00	62,500	125.00%	125,000	125.00%	187,500	125.00%	250,000	125.00%
1.25	75,000	150.00%	150,000	150.00%	225,000	150.00%	300,000	150.00%
1.50	100,000	200.00%	200,000	200.00%	300,000	200.00%	400,000	200.00%
2.00	125,000	250.00%	250,000	250.00%	375,000	250.00%	500,000	250.00%

% of Notional or premium

The table below illustrates the Transaction Costs for a notional or premium of \$10,000,000:

Transaction Costs (%)	Transaction Costs (\$ USD)	% Notional
0.00%	-	0.00%
0.01%	1,000	0.01%
0.10%	10,000	0.10%
0.50%	50,000	0.50%
0.75%	75,000	0.75%
1.00%	100,000	1.00%
2.00%	200,000	2.00%
3.00%	300,000	3.00%
4.00%	400,000	4.00%
5.00%	500,000	5.00%
7.50%	750,000	7.50%
10.00%	1,000,000	10.00%
15.00%	1,500,000	15.00%
20.00%	2,000,000	20.00%

Ongoing charges

J.P. Morgan investable indices and J.P. Morgan synthetic dynamic trades may contain synthetic transaction charges and, where applicable, the index level or return is published net of these synthetic transaction charges. The synthetic transaction charges act as a drag on the performance of the investable index and synthetic dynamic trades and reduce the performance compared to an index or synthetic dynamic trade that does not contain synthetic transaction charges.

The impact of this drag is determined by regularly calculating the investable index level, or return on the synthetic dynamic trade, over the holding period with and without the applicable synthetic transaction charges and converting such difference into a cash amount.

J.P. Morgan investable indices and synthetic dynamic trades may include products from one or more of the financial instruments listed above.

Factors that affect the magnitude of the drag caused by the synthetic transaction charges may include but are not limited to:

- The amount of leverage in the synthetic dynamic trade or the product referencing the investable index;
- The number of times the constituents of the synthetic dynamic trade or investable index is re-balanced, and the magnitude of such changes, in line with its rules;
- The number of times the client or index allocator alters the composition of the synthetic dynamic trade or investable index where applicable and the magnitude of such alterations;
- The level of licensing fees for any underlying indexes the product references;
- The level of charges for capacity or limits use;
- Other charges deducted from the Investable Index or synthetic dynamic trade, in line with their respective rules.

The table below gives an indication of the range of synthetic transaction costs, expressed as both percentage terms and on a representative notional amount of USD 10,000,000 that could be incurred by clients holding a position for a calendar year in a J.P. Morgan synthetic dynamic trade or a product whose return references a J.P. Morgan investable index.

Synthetic Transaction Charges (%)	Annual Ongoing Costs (\$ USD)	% Notional
0.00%	-	0.00%
2.50%	250,000	2.50%
5.00%	500,000	5.00%
7.50%	750,000	7.50%
10.00%	1,000,000	10.00%
12.50%	1,250,000	12.50%
15.00%	1,500,000	15.00%

Additional cost information may be provided as part of the pre-trade documentation for applicable transactions.

Ex post disclosures

J.P. Morgan will make available annual ex post statements of actual costs and charges ('Ex post disclosures') to clients as required by MiFID II. As such, Ex post disclosures will be made available to clients where J.P. Morgan (i) has recommended or marketed a product or had to provide the client with a Key Information Document ('KID') and (ii) where J.P. Morgan has determined it has an ongoing relationship with the client for the purposes of Ex post disclosure requirements under MiFID II.

J.P. Morgan has concluded that, in the context of wholesale markets instruments, the firm does not have an 'on-going relationship' in respect of execution services provided to clients which it determines are of an immediate and non-continuous nature. Accordingly, Ex post disclosures will only apply in the limited circumstances where the firm provides a service it determines to be of an ongoing nature and for which ongoing fees are paid by clients.

For the avoidance of doubt, in respect of products which reference J.P. Morgan investable indices, the firm has concluded it does not have 'on-going relationship'. This includes where J.P. Morgan investable indices have a third party allocator that can rebalance the index, for example, via the 'Nexus' platform. While we have concluded that we do not have an ongoing relationship in this scenario if you would like to discuss this further and have more details please contact your usual J.P. Morgan representative.

Ex post disclosures for the relevant period will usually be accessible via the J.P. Morgan Markets website JPMM.com or provided by your usual J.P. Morgan representative

If you would like further information on the costs and charges in the Ex post disclosures or in respect of J.P. Morgan investable index products, please contact your usual J.P. Morgan representative.