

# EURONEXT DERIVATIVES NOTICE

All Markets

No. NO170914DE

Issue Date:

14 September 2017

## CONSULTATION IN RELATION TO A PROPOSAL TO AMEND THE FAIR VALUE METHOD

### Executive Summary

This Notice seeks feedback from Members in relation to a proposal to amend the Fair Value Method in the Euronext Derivatives Corporate Actions Policy.

### 1. Background

1.1. As Members are aware, Euronext provides for the adjustment of Euronext equity derivative products in the event of a corporate action affecting the relevant underlying stock, in accordance with the Euronext Derivatives Corporate Actions Policy.

1.2. Euronext is constantly striving to enhance the Euronext Derivatives Corporate Actions Policy. As part of this process, Euronext proposes to improve the Fair Value Method used.

### 2. Fair Value Method

2.1. One of the main goals of the Euronext Derivatives Corporate Actions Policy is to preserve the economic value of derivatives positions which are subject to Corporate Action adjustment. The Fair Value Method is used to calculate the final settlement prices to cash-settle derivatives when the underlying shares are subject to a takeover bid or delisting as defined in the Euronext Corporate Actions Policy. The final settlement prices used to cash-settle options in case of a Fair Value method delisting are calculated using the Cox-Ross-Rubenstein option valuation model.

2.2. The necessary inputs to calculate fair values using this model are:

- The price of the takeover offer;
- Dividend forecasts, i.e., “Markit Dividends”;
- Implied volatilities for each option series;
- Interest rate (i.e. Euribor/LIBOR, the applicable rate for the remaining life time of the option).

2.3. Euronext currently uses an average implied volatility of the relevant options series over a 10-trading-day period. For each day of the 10-day period an implied volatility is determined for each series based on:

- The daily settlement price (“DSP”) of each series;
- The underlying share price at the time of the settlement price calculation;
- Interest rate (i.e., Euribor/LIBOR, the applicable rate for the remaining lifetime of the option);
- Dividend forecast by an independent provider, i.e., “Markit Dividends”.

Subsequently, the average of the implied volatility for each series over the 10-day period is calculated, excluding the lowest and the highest implied volatility observation of that series over the 10-day period.

The Euronext Markets comprise the markets operated by Euronext Amsterdam, Euronext Brussels, Euronext Lisbon, Euronext Paris and Euronext London, referred to respectively as the Amsterdam, Brussels, Lisbon, Paris and London markets, as relevant. Euronext refers to Euronext N.V. and its affiliates.

### 3. Changes

3.1. In order to further improve the Euronext Derivatives Corporate Actions Policy, Euronext intends to amend the Fair Value Method as follows:

- In the process of calculating Fair Value settlement prices, Euronext will no longer calculate implied volatilities as described in 2.3. Instead, Euronext will use the settlement volatilities from the Euronext Pricer. Consequently, this will also impact other parameters used in the Fair Value Method, such as dividend forecasts and interest rates.
- Settlement volatilities: The Euronext Pricer is a derivatives pricing application that is used by Euronext during the trading day to, amongst others, calculate reference prices for price validation of derivatives orders. Dividends and a volatility for each option series are determined within the Euronext Pricer, based on prices in the market. At end-of-day, the settlement volatility, dividend forecasts, interest rates and closing price of the underlying value are used to determine the DSP for the option series.

3.2. Overview of the proposed changes to the Fair Value method.

Euronext will not change the way we communicate about corporate actions, and we will continue to inform our members of all relevant information, including the average settlement volatility and dividend forecasts, via corporate action notices.

#### Options

If and when an option contract is subject to a Fair Value delisting, Euronext will use the following parameters to determine the Fair Value settlement prices for each option series:

- The average settlement volatility of each series, used for the calculation of DSP by the Euronext Pricer, over a 10-day period. The lowest and the highest observations are excluded;
- Dividend forecasts used for the calculation of DSP by the Euronext Pricer;
- Interest rates from the Euronext Pricer of the effective date;
- Fair Value calculations will be made in the Euronext Pricer.

#### Single Stock Futures

If and when a Single Stock Future contract is subject to a Fair Value delisting, Euronext will use the following parameters to determine the Fair Value settlement prices for Single Stock Futures:

- Dividend forecasts, whereby the source of the dividend forecasts is:
  - In the case that Euronext has listed options on the same underlying value as the future, dividend forecasts used for the calculation of DSP by the Euronext Pricer;
  - In the case that the future has longer maturities than the listed option contract, Markit dividend forecasts for the longer maturities;
  - In the case that Euronext has no options listed on the underlying value of the future, Markit dividend forecasts.
- Interest rates from the Euronext Pricer on the effective date
- Fair Value calculations will be made in the Euronext Pricer.

### **Single Stock Dividend Futures**

If and when a Single Stock Dividend Future contract is subject to a Fair Value delisting, Euronext will use the following parameters to determine the Fair Value settlement prices for Single Stock Dividend Futures:

- Dividend forecasts, whereby the source of the dividend forecasts remains Markit;
- Interest rates from the Euronext Pricer on the effective date;
- Fair Value calculations will be made in the Euronext Pricer.

### **4. Example**

Attachment 1 shows a detailed example to highlight the difference between the current Fair Value method and the amended Fair Value method. In this example, the following information is used: PHI options listed in Amsterdam, date used for interest rates and dividend 5 May 2017. The period for which we calculated the implied/settlement is 20 April 2017 up to and including 4 May 2017.

### **5. Consultation**

Members are invited to voluntarily comment on the above proposal, and are kindly requested to submit the response form (set out in attachment 2 to this Notice) by 15 October 2017 by email to [CorporateActionsTeam@euronext.com](mailto:CorporateActionsTeam@euronext.com).

For further information in relation to this Notice, please contact:

Euronext Market Services  
– Corporate Actions

+31 (0)20 721 9588

[CorporateActionsTeam@euronext.com](mailto:CorporateActionsTeam@euronext.com)

Attachment 1

MARKIT DIVIDEND	EX-DATE	DIVIDEND PRICING TOOL
0.80	15-May-17	0.77
0.85	15-May-18	0.65
0.90	15-May-19	0.54
0.95	15-May-20	0.52
1.00	17-May-21	0.50

INTERPOLATED INTEREST RATES ECB	MATURITY	INTEREST RATES PRICING TOOL
-0.3740	19-May-17	-0.33
-0.3604	16-Jun-17	-0.33
-0.3338	21-Jul-17	-0.33
-0.2903	15-Sep-17	-0.33
-0.2138	15-Dec-17	-0.35
-0.1510	16-Mar-18	-0.37
-0.1236	15-Jun-18	-0.37
-0.1218	21-Dec-18	-0.33
-0.1023	21-Jun-19	-0.24
-0.0439	20-Dec-19	-0.25
0.0145	19-Jun-20	-0.24
0.0726	18-Dec-20	-0.22
0.1326	18-Jun-21	-0.19
0.1984	17-Dec-21	-0.12

AMENDED METHOD	CURRENT METHOD			CURRENT METHOD	AMENDED METHOD
CALL VOLA	CALL VOLA	EXPIRY	STRIKE	PUT VOLA	PUT VOLA
37.5	29.7	19-May-17	24.00	37.1	36.7
36.4	26.2	19-May-17	25.00	36.1	34.4
35.5	22.9	19-May-17	26.00	33.3	31.4
31.4	18.9	19-May-17	27.00	29.9	28.2
29.3	17.2	19-May-17	27.50	27.9	26.6
28.7	15.8	19-May-17	28.00	27.0	25.1
25.5	13.9	19-May-17	28.50	25.1	23.5
23.8	13.4	19-May-17	29.00	23.4	21.9
21.9	12.8	19-May-17	29.50	22.4	20.3
19.7	11.3	19-May-17	30.00	21.3	19.0
16.7	9.4	19-May-17	31.00	20.3	17.0

15.3	10.6	19-May-17	32.00	22.1	16.3
14.2	12.8	19-May-17	33.00	22.3	17.1
16.7	15.8	19-May-17	34.00	34.0	22.0
17.9	17.8	19-May-17	36.00	46.8	30.0
30.0	15.4	19-May-17	38.00	58.4	36.1
29.4	60.2	16-Jun-17	14.00	32.6	31.4
29.3	55.7	16-Jun-17	15.00	32.6	31.4
29.3	52.2	16-Jun-17	16.00	32.6	31.4
29.0	43.4	16-Jun-17	18.00	32.6	31.4
28.4	36.4	16-Jun-17	20.00	32.6	31.4
27.9	33.2	16-Jun-17	21.00	32.6	31.4
27.3	30.1	16-Jun-17	22.00	32.6	31.4
26.7	27.3	16-Jun-17	23.00	32.4	31.4
26.1	24.5	16-Jun-17	24.00	32.0	30.8
25.6	21.4	16-Jun-17	25.00	31.4	30.1
24.8	18.8	16-Jun-17	26.00	28.9	27.7
24.2	17.8	16-Jun-17	27.00	26.0	24.7
23.1	14.8	16-Jun-17	28.00	23.4	22.0
22.1	13.3	16-Jun-17	28.50	21.8	20.7
20.9	11.8	16-Jun-17	29.00	20.9	19.7
19.6	11.4	16-Jun-17	29.50	20.0	18.9
18.6	10.4	16-Jun-17	30.00	19.4	18.0
16.5	9.9	16-Jun-17	31.00	18.8	16.8
15.5	11.7	16-Jun-17	32.00	19.3	16.2
14.5	13.2	16-Jun-17	33.00	19.4	15.5
16.1	14.9	16-Jun-17	34.00	24.0	17.6
16.4	15.4	16-Jun-17	35.00	26.8	19.1
16.7	15.6	16-Jun-17	36.00	30.4	20.9
15.9	15.4	16-Jun-17	38.00	33.9	29.5
16.7	16.0	16-Jun-17	40.00	45.1	39.7
16.7	16.0	16-Jun-17	45.00	60.5	47.3
16.7	16.0	16-Jun-17	50.00	73.2	22.2
24.6	16.9	21-Jul-17	27.00	22.5	20.3
21.3	14.4	21-Jul-17	28.00	20.7	18.8
19.0	11.8	21-Jul-17	29.00	19.0	17.5
17.5	10.3	21-Jul-17	30.00	18.0	16.6
16.2	11.5	21-Jul-17	31.00	17.3	16.1
15.6	13.8	21-Jul-17	32.00	17.2	16.1
15.2	14.4	21-Jul-17	33.00	18.4	16.7
15.3	14.5	21-Jul-17	34.00	19.0	18.3
15.8	15.3	21-Jul-17	36.00	21.5	20.3
15.9	17.8	21-Jul-17	38.00	25.9	34.5

50.0	31.0	15-Sep-17	18.00	35.6	32.9
44.5	29.5	15-Sep-17	20.00	33.5	29.7
39.0	21.7	15-Sep-17	22.00	30.0	26.4
32.2	17.6	15-Sep-17	24.00	26.9	24.7
28.8	15.7	15-Sep-17	25.00	25.1	23.3
25.8	13.8	15-Sep-17	26.00	23.6	22.0
22.8	12.1	15-Sep-17	27.00	22.3	20.9
20.8	11.5	15-Sep-17	28.00	21.3	19.9
19.8	10.9	15-Sep-17	29.00	20.5	19.1
18.7	12.1	15-Sep-17	30.00	19.6	17.9
17.6	15.9	15-Sep-17	32.00	19.1	17.1
16.7	15.8	15-Sep-17	34.00	18.3	17.5
17.0	16.0	15-Sep-17	35.00	20.5	20.6
17.3	17.0	15-Sep-17	40.00	27.7	26.6
17.3	17.5	15-Sep-17	45.00	35.6	31.9
17.3	17.5	15-Sep-17	50.00	42.8	35.5
68.7	48.9	15-Dec-17	10.00	35.9	34.0
54.1	32.9	15-Dec-17	15.00	35.9	32.2
44.6	26.1	15-Dec-17	18.00	32.5	29.6
38.7	21.9	15-Dec-17	20.00	30.0	27.1
33.0	18.3	15-Dec-17	22.00	27.0	24.8
27.4	14.9	15-Dec-17	24.00	25.1	23.8
25.2	13.3	15-Dec-17	25.00	24.0	22.9
23.5	13.4	15-Dec-17	26.00	23.3	22.0
21.9	11.8	15-Dec-17	27.00	22.4	21.2
21.1	12.6	15-Dec-17	28.00	21.6	20.6
20.3	15.6	15-Dec-17	29.00	20.9	20.0
19.7	17.3	15-Dec-17	30.00	20.4	19.1
18.8	17.3	15-Dec-17	32.00	19.9	18.5
18.1	17.0	15-Dec-17	34.00	19.3	18.6
18.2	17.1	15-Dec-17	35.00	20.4	19.7
18.7	18.0	15-Dec-17	40.00	24.0	23.9
18.9	18.7	15-Dec-17	45.00	30.6	25.6
24.3	16.3	16-Mar-18	22.00	25.9	24.0
23.4	13.3	16-Mar-18	24.00	24.0	22.5
22.6	11.9	16-Mar-18	26.00	22.8	21.3
21.2	16.4	16-Mar-18	28.00	21.5	20.7
20.7	18.1	16-Mar-18	29.00	21.0	20.3
20.3	18.6	16-Mar-18	30.00	20.9	19.6
19.5	18.0	16-Mar-18	32.00	20.3	19.0
18.8	18.0	16-Mar-18	34.00	19.5	19.0
18.8	17.6	16-Mar-18	35.00	20.3	19.2

18.8	18.0	16-Mar-18	40.00	22.5	20.8
19.8	19.0	16-Mar-18	45.00	27.0	30.5
48.7	28.1	15-Jun-18	15.00	30.6	27.0
34.8	18.8	15-Jun-18	20.00	26.9	25.3
30.5	17.5	15-Jun-18	22.00	25.3	24.0
25.4	14.5	15-Jun-18	24.00	23.9	23.2
23.9	13.1	15-Jun-18	25.00	23.1	22.8
23.0	12.9	15-Jun-18	26.00	22.6	21.8
21.8	18.6	15-Jun-18	28.00	21.8	21.1
21.0	19.5	15-Jun-18	30.00	21.0	20.1
19.6	18.8	15-Jun-18	35.00	20.3	20.4
19.3	18.6	15-Jun-18	40.00	21.0	33.6
55.4	38.3	21-Dec-18	10.00	33.3	30.4
40.6	25.8	21-Dec-18	15.00	30.4	27.7
33.9	20.3	21-Dec-18	18.00	27.6	26.2
31.0	17.3	21-Dec-18	20.00	25.9	25.0
27.4	14.4	21-Dec-18	22.00	24.9	24.0
24.2	13.6	21-Dec-18	24.00	23.9	23.6
23.6	16.4	21-Dec-18	25.00	23.6	23.1
23.0	18.9	21-Dec-18	26.00	22.9	22.4
22.1	21.0	21-Dec-18	28.00	22.3	21.8
21.5	20.4	21-Dec-18	30.00	21.6	20.8
20.4	19.6	21-Dec-18	35.00	20.9	20.8
20.0	19.3	21-Dec-18	40.00	21.3	32.0
44.9	36.1	20-Dec-19	10.00	31.9	27.7
34.1	23.9	20-Dec-19	15.00	27.3	25.3
28.2	16.1	20-Dec-19	20.00	24.9	24.5
25.2	13.5	20-Dec-19	22.00	23.9	23.8
23.9	18.8	20-Dec-19	24.00	23.3	23.6
23.5	21.5	20-Dec-19	25.00	22.9	23.3
23.0	22.3	20-Dec-19	26.00	22.6	22.7
22.4	22.1	20-Dec-19	28.00	21.9	22.3
21.8	21.5	20-Dec-19	30.00	21.6	21.7
21.0	20.8	20-Dec-19	35.00	20.8	21.5
20.5	20.1	20-Dec-19	40.00	20.4	29.1
52.9	36.2	18-Dec-20	10.00	28.5	26.8
39.2	26.4	18-Dec-20	15.00	26.1	25.1
28.2	17.8	18-Dec-20	20.00	24.3	24.5
24.8	14.9	18-Dec-20	22.00	23.5	24.0
24.0	22.6	18-Dec-20	24.00	22.9	23.7
23.5	23.5	18-Dec-20	25.00	22.8	23.6
23.2	23.5	18-Dec-20	26.00	22.4	23.1

22.7	22.9	18-Dec-20	28.00	21.9	22.7
22.2	22.6	18-Dec-20	30.00	21.6	21.9
20.9	21.0	18-Dec-20	40.00	20.3	22.1
20.6	20.8	18-Dec-20	50.00	19.3	26.4
40.5	26.3	17-Dec-21	15.00	25.4	25.0
27.9	17.4	17-Dec-21	20.00	23.5	24.0
23.7	24.6	17-Dec-21	25.00	22.4	23.9
23.4	24.6	17-Dec-21	26.00	22.4	23.6
22.9	23.9	17-Dec-21	28.00	21.6	23.3
22.5	23.8	17-Dec-21	30.00	21.4	23.6
22.6	24.0	17-Dec-21	32.00	22.0	22.7
21.4	21.9	17-Dec-21	40.00	20.1	22.8
20.9	21.4	17-Dec-21	50.00	18.8	24.5



Attachment 2

**RESPONSE FORM**

Notice NO170914DE - **Consultation in relation to a proposal to amend the Fair Value Method**

<b>Member:</b>	
<b>Representative:</b>	
<b>Email address:</b>	
<b>Response:</b>	<input type="checkbox"/> <b>Yes, I agree to the proposal.</b>  <input type="checkbox"/> <b>No, I don't agree to the proposal.</b>
<b>Comments:</b> <i>(Optional)</i>	