Total Return Future on the CAC 40® Index

The listed solution to trade the implied equity repo rate on the CAC 40® Index

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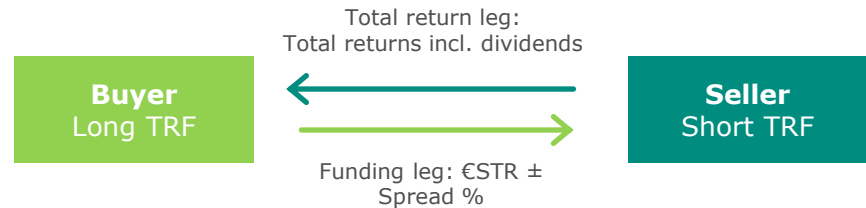
Benefits of trading the TRF on the CAC 40

The Total Return Future on the CAC 40® Index (TRF):

- Offers a **listed solution to trade the implied equity repo rate on the CAC 40**, until now traded OTC as total return swaps (TRS). The TRF spread is expressed as an annualised rate (+/-) in basis points;

- Offers **long-term exposure** with maturities available **up to 10 years** (the 21 nearest quarterly months of the March, June, September and December cycle and the 5 following December maturities);

- Offers a **cost-efficient approach** to trade the TRS, which **mitigates counterparty risk and provide strong margin offsets** when trading the CAC 40 Index future and the TRF (see margin efficiency and offsets slide);

- Offers **payoff accuracy** and **fungibility** through a clear daily settlement procedure and possibility of trading at index close;

- Provides **market transparency** and improved liquidity through a centralised order book;

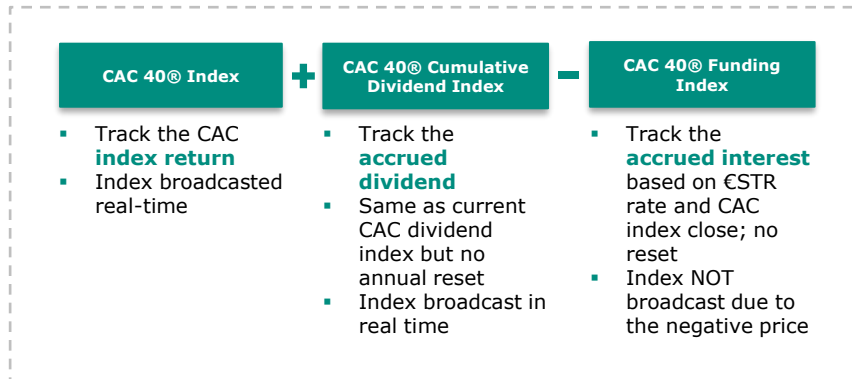- Aims to attract new clients (pension funds, asset managers) wanting to use repo as a new asset class.

The TRF is designed to replicate the full economics of OTC total return swaps in a cost-effective manner, while simplifying the product settings to make it more suited to the exchange environment.

Total return leg:
Total returns incl. dividends

Buyer
Long TRF

Seller
Short TRF

Funding leg: €STR ± Spread %

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Trading methodology (1/2)

The basic economics of a TRF contract include 4 elements, where **the Synthetic Dividend Index price** is publicly available and the **TRF Spread** will be quoted/agreed by market participants with on-screen transparency.
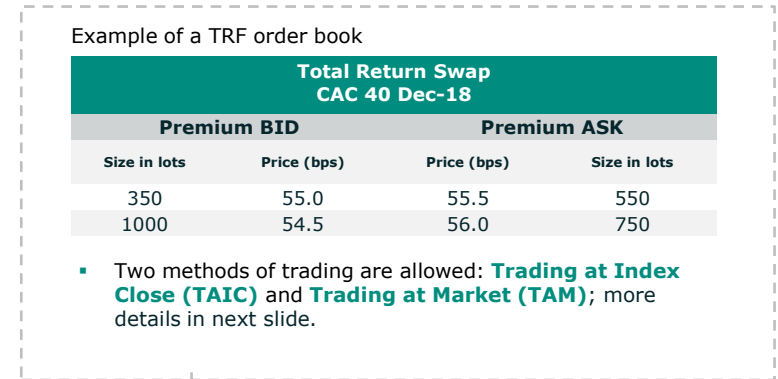
Publicly available data

CAC 40® Index	**+**	**CAC 40® Cumulative Dividend Index**	**−**	**CAC 40® Funding Index**

- Track the CAC **index return**
- Index broadcasted real-time

- Track the **accrued dividend**
- Same as current CAC dividend index but no annual reset
- Index broadcast in real time

- Track the **accrued interest** based on €STR rate and CAC index close; no reset
- Index NOT broadcast due to the negative price

COB Transparency

Example of a TRF order book

Total Return Swap CAC 40 Dec-18			
Premium BID		**Premium ASK**	
Size in lots	**Price (bps)**	**Price (bps)**	**Size in lots**
350	55.0	55.5	550
1000	54.5	56.0	750

- Two methods of trading are allowed: **Trading at Index Close (TAIC)** and **Trading at Market (TAM)**; more details in next slide.

CAC 40® TRF Synthetic Dividend Index

+

TRF Spread

=

TRF Futures price

- Incorporate the three elements to track the total returns based on €STR rate;
- Act as a basis for members to price the TRF
- Index broadcast in real time

- Track the **premium spread** above €STR
- Price will be quoted/agreed by market participants with on-screen transparency

- Replicate the **full economics** of OTC TRS
- Bring in **fungibility** by standardisation

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Trading methodology (2/2)

Members can trade the TRF using two modes:

A. Trading At Index Close (TAIC)

B. Trading At Market (TAM)

	A. Trading At Index Close (TAIC)	B. Trading At Market (TAM)
TRADING FACILITY	Via Central Order Book & Wholesale	Via Wholesale only
ORDER ENTRY	**TRF Spread** in bps, e.g. 50.5 bps	**TRF Futures price** in index points, e.g. 5,300.77 points
TRADE PRICE	Final futures price is known at the end of the day (after the index close is known)	Final futures price is known at the time of trading

Example of a TAIC trade

Total Return Futures CAC 40 Dec-18			
Premium BID		**Premium ASK**	
Size in lots	Price (bps)	Price (bps)	Size in lots
300	50.0	50.0	300
420	49.5	50.5	250

Buyer ⟷ ⟷ Seller

Trade execution

On 20 Aug 2018, the equilibrium in the order book generates one transaction:
300 lots of CAC TRF Dec-18 Expiry are traded at 50.0 bps; Trading mode: Trading at Index Close (TAIC)

Trade Info	
Trade date	20/08/2018
Traded Spread (bps)	50.0 bps
Traded Quantity	300 lots
Expiry date (T)	21/12/2018

End of day

At the end of day, final futures price will be calculated based on CAC Synthetic Dividend Index Close
300 lots of CAC TRF futures Dec-18 Expiry will be delivered at the price of 5,733.61

Final futures price calculation	
CAC Index closing at 20/08/2018 (1)	5,370.14
Cumul. Dividend index close (2)	323.09
Funding index closing (3)	-30.91
Basis traded (4)	9.47
Traded futures price = (1) + (2) - (3) + (4)	**5,733.61**

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Transaction fee and market making scheme

Transaction fee

- **Trading + Clearing fee:** **€0.9 per lot**

- **Settlement fee:** **€0.9 per lot**

Market Maker revenue-sharing programme

- **Quotation requirement**

  - Presence time: at least 80% on COB between 09:01 and 17:25 CET, in accordance with the below spread/size requirement

Maturities	Maximum spread in basis points	Minimum size
1st maturity	20	25
2nd maturity	15	25
3rd maturity	10	10

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Margin efficiency and offsets (1/2)

Two steps to calibrate the Initial Margin on TRF:

- The **Initial Margin** parameter is calibrated using absolute returns on a **2-day** holding period

- The **Initial Margin** parameter is floored at the CAC 40® initial margin parameter; when necessary, a **penalty of 0.15%** will be added to cover any Daily Settlement Basis decorrelation

LCH SA Initial Margin:

- **Naked positions** on TRF:

  - Estimated Initial margin parameter on TRF without offset with CAC 40® future is: **7.22%**

- "**Perfect**" spread position of TRF vs CAC 40 future:

  - The margin parameter is **1.44%**

- Effective initial margin will depend on the constituents and buy/sell positions of each portfolio.*

* Initial margin can be as low as 0.58%, calculated on a real production portfolio

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Margin efficiency and offsets (2/2)

Margin offsets

The Total Return Future on the CAC 40® Index is cleared by LCH SA. Participants therefore benefit from:

- Mitigation of counterparty risk due to Central Counterparty Clearing

- Margin offsets across listed equity index products

Illustration of most frequently traded strategy:

When going **long the TRF on CAC 40® Index** and **short the CAC 40® Index Future**, investors will benefit from margin savings up to 92%* as follows:

Portfolio	Individual Initial Margins	Total Margin** before offset	Final Margin** before offset	Offset** between 2 underlyings
Long TRF CAC 40®	5.05% or €276	5.01% or €537	0.38% or €44	up to 92%
Short CAC 40® Future	4.96% or €261			

Below are multiple examples of margin savings across frequently used portfolios:

Product Long / Product Short	Initial Margin with offset applied**	Offset effect**
TRF CAC 40® versus Index Futures		
TRF CAC 40® / CAC 40® Future	0.38%	up to 92%
TRF CAC 40® / AEX® Future	2.19%	up to 57%
TRF CAC 40® versus Single Stock Futures (SSF)		
TRF CAC 40® / Total SSF	4.10%	up to 50%
TRF CAC 40® / Total SSF + BNP Paribas SSF + Unicredit SSF	3.38%	up to 63%
TRF CAC 40® versus Index Dividend Futures		
TRF CAC 40® / CAC 40® Dividend Future	4.01%	up to 30%

*92% is the offset on the long/short strategy: as required by EMIR where portfolio margining covers multiple instruments, the amount of margin reductions will comply with the EMIR regulatory cap set at 80% of the sum of the margins for each product calculated on an individual basis.

** The margin parameters are updated on a regular basis and can be found at www.lch.com/risk-collateral-management/risk-notices. The ones used in these examples were estimated as of June 2017 and are provided for illustration purposes only. Please refer to the LCH website www.lch.com for the full methodology and application rules.

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Contract specifications

CONTRACT	Total Return Futures (TRF) on CAC 40® Index
EURONEXT DERIVATIVE MARKET	Paris
UNDERLYING INDICES	CAC 40® Index, CAC 40® Cumulative Dividend Index and CAC 40® Funding Index referring to €STR (combined as CAC 40® Synthetic Dividend Index)
CONTRACT MULTIPLIER (CONTRACT SIZE)	€10 per index point (e.g. value € 41,000 at 4,100.0)
MINIMUM TRF SPREAD	+/- 0.5 bps (1 basis point = 0.0001)
QUOTATION TRF SPREAD (BASIS POINTS)	TRF spread as annualised rate expressed in basis points with one decimal (+/-/0)
ORDER TYPES	Trade at Index Close (TAIC) with an index level based on the daily CAC 40® Index close. Trade at Market (TAM) with a custom-defined index level.
TRADING HOURS	Central Order Book (TAIC): 09:30 - 17:30 CET Large-in-Scale Facility (TAIC & TAM): 09:30 - 18:30 CET
ACCRUED DISTRIBUTIONS & ACCRUED FUNDING (INDEX POINTS)	The distribution and funding rate payments will be accumulated from the TRF product launch and added to the TRF futures price in index points. The daily changes in distributions and funding payments are paid out via variation margin.
WHOLESALE SERVICE	Large-in-Scale
MATURITIES/TENOR	Up to 10 years – the 21 nearest quarterly months of the March, June, September and December cycle and the 5 following December maturities
EXPIRY DATE	The 3rd Friday of the expiry month in the March, June, September and December cycle. If the third Friday is not an exchange trading day, expiry will be on the trading day immediately preceding that day
TIME CONVENTION	Actual/360
DAILY SETTLEMENT TRF SPREAD (BASIS POINTS)	Daily Settlement Basis in bps for each maturity is decided by (1) VWAP of all trades in last 30 mins; (2) if no trade during this time period, then the mid-BBO at the closing time is used; (3) if no BBO available then the previous Daily Settlement Basis is used.
DAILY SETTLEMENT PRICE (INDEX POINTS)	Established on the current exchange trading day based on the following components: Close CAC, Daily Settlement Basis, Accumulated Dividend Index and Accumulated Funding Index
SETTLEMENT	Cash settlement, due on the first exchange trading day after final settlement day
LAST TRADING DAY	The Euronext exchange trading day immediately preceding the expiration day
FINAL SETTLEMENT PRICE (INDEX POINTS)	Established on expiry day and based on the following components: Final settlement price of all CAC 40® Index Futures (CAC), accrued distributions and accrued funding from the product launch until the expiry date.
MINIMUM SIZE FOR LARGE-IN-SCALE TRADE	10 lots
VENDOR CODES	Bloomberg: TRCA <Index> Reuters: 0#FCTS

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Appendices

TRF Indices

Euronext has built dedicated indices for TRF pricing, combining in real-time the three components: CAC 40® Index, accrued dividend and accrued funding.

Index name	ISIN code	Memo	Bloomberg Code	Reuters code	Base date	Base value
CAC 40® Synthetic Dividend	FR0013252418	C4SD	C4SD	.C4SD	19-12-16	4822,77
CAC 40® Funding	Not broadcasted	C4FU			01-10-18	0
CAC 40® Cumulative Dividend	FR0013252392	C4CD	C4CD	.C4CD	19-12-16	0
CAC 40®	FR0003500008	PX1	CAC	.FCHI	31-12-87	1000

CAC 40® Synthetic Dividend Index

CAC 40® Synthetic Dividend Index = CAC 40® Index (1) + CAC 40® Cumulative Index (2) − CAC 40® Funding Index (3)

(1) CAC 40® Index

(2) CAC 40® Cumulative Index

The index follows the same index rule as CAC 40® Dividend Index, but <u>without reset</u>.

(3) CAC 40® Funding Index (not broadcast)

Funding index t = Funding index t-1 + Daily accrued funding t

Daily accrued funding t = CAC Index Close$_{t-1}$*recalibrated €STR-1*[(t+2BD)-((t-1)+2BD)]/360

Though not broadcast, the funding index can be easily retrieved from 1) the data file published twice a day or 2) the Synthetic Dividend Index formula above (all 3 other elements are known).

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Trading formulas

1) Trading At Index Close:

TRF Futures Price = CAC Synthetic Dividend Index Close $_t$ + TRF spread price in index point

TRF spread price in index point = TRF spread price in bps * CAC Index Close $_t$ * Days to Maturity $_t$

Days to Maturity $_t$ = (Expiry date + 2BD) – (t + 2BD)

2) Trading At Market:

TRF Futures Price = the Traded Price (the custom-defined index level)

3) Daily Settlement Price:

DSP = CAC Synthetic Dividend Index Close + TRF Daily Settlement spread of the respective expiry

4) Final Settlement Price (EDSP):

EDSP = Final Settlement Price of CAC index futures (FCE) + Cumul. Dividend Index close – Funding Index close

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Trading and clearing messages

TRADING MEMBER MESSAGING

At the trading member level, one execution report (message 8) will be received for TAM trade, and two execution reports will be received for TAIC trade

- **For Trading At Market (TAM) trade**

  - A confirmed execution report in index points (clearing notation) with an Exec Type = 'C'

- **For Trading At Index Close (TAIC) trade**

  - A temporary Execution report in both Basis Price and Temporary Index Price with an Exec Type = 'B'

  - A confirmed execution report with both Basis Price and updated Final Index Price (clearing notation) with an Exec Type = 'C'

Note: TradeID & ExecID will be the same for the same pair of temporary/final trades.

CLEARING MEMBER MESSAGING

At the clearing member level, to allow members to track the **TAIC trade** (Preliminary & Final) and differentiate from **TAM trade**, clearing members will receive the **ExternalTradeID** from LCH following the rules below:

- TAIC temporary (create and delete) trade will always end with '5'

- TAIC final trade and TAM trade will always end with '0' (COB) or '9' (wholesale)

- TAIC temporary and final trades will share the same Trade ID except the last digit

  - Temporary: 111111**5**, validity indicator = 'T'

  - Final: 111111**0** or 111111**9**, validity indicator = 'F'

For the same trade: 'TradeID' on the trading side is the same as on the clearing side except for the last digit: e.g."111111" for trading, "111111**0**" for clearing
In this way, clearing members are able to identify/reconcile the two types of trade.

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Market data file

- Euronext publishes a daily TRF data file, which contains all the pricing information.

- The file is published twice a day (Start of Day preliminary version at 09:20 CET / End of Day extended version at 19:05 CET) and is available on the Euronext website and via the Euronext File Server (EFS).

- Please refer to the parameter file specifications on the website

connect2.euronext.com

> TRF Conversion Parameters Files Specifications

Example of data file:

Publicatio	Contract_	Expiry_co	Symbol_in	ProdBusD	Annualisa	BusinessD	DaySettID	FundingD	InstBusDa	ExpSettID	DaysToMa	SettISpre	SettIBasis	SettIClgP	Funding_I	Cumulati	Prelimina	FinalInde	FundingRa	DailyFund	DailyDistr	SyntheticDividendIndex
20180910	JFFCS	sept-18	4.18E+09	20180910	360	2	20180912	1	20180910	20180925	12	0.000176	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	DEC18	4.18E+09	20180910	360	2	20180912	1	20180910	20181227	105	0.001537	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	mars-19	4.18E+09	20180910	360	2	20180912	1	20180910	20190319	187	0.002737	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	JUN19	4.18E+09	20180910	360	2	20180912	1	20180910	20190625	285	0.004172	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	sept-19	4.18E+09	20180910	360	2	20180912	1	20180910	20190924	376	0.005504	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	DEC19	4.18E+09	20180910	360	2	20180912	1	20180910	20191224	467	0.006836	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	mars-20	4.18E+09	20180910	360	2	20180912	1	20180910	20200324	558	0.008168	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	JUN20	4.18E+09	20180910	360	2	20180912	1	20180910	20200623	649	0.0095	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	sept-20	4.18E+09	20180910	360	2	20180912	1	20180910	20200922	740	0.010832	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	DEC20	4.18E+09	20180910	360	2	20180912	1	20180910	20201222	831	0.012164	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	mars-21	4.18E+09	20180910	360	2	20180912	1	20180910	20210323	922	0.013496	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	JUN21	4.18E+09	20180910	360	2	20180912	1	20180910	20210622	1013	0.014828	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	sept-21	4.18E+09	20180910	360	2	20180912	1	20180910	20210921	1104	0.01616	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	DEC21	4.18E+09	20180910	360	2	20180912	1	20180910	20211221	1195	0.017492	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	mars-22	4.18E+09	20180910	360	2	20180912	1	20180910	20220322	1286	0.018824	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	JUN22	4.18E+09	20180910	360	2	20180912	1	20180910	20220621	1377	0.020156	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	sept-22	4.18E+09	20180910	360	2	20180912	1	20180910	20220920	1468	0.021488	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	DEC22	4.18E+09	20180910	360	2	20180912	1	20180910	20221220	1559	0.02282	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	mars-23	4.18E+09	20180910	360	2	20180912	1	20180910	20230321	1650	0.024152	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	JUN23	4.18E+09	20180910	360	2	20180912	1	20180910	20230620	1741	0.025485	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058
20180910	JFFCS	sept-23	4.18E+09	20180910	360	2	20180912	1	20180910	20230919	1832	0.026817	0.01	0	-32.0983	323.33	5252.218	5269.631	-0.00361	-0.0527	0	5625.058

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