

# Eurex<sup>®</sup> Historical Order Book

## Improve your Strategies



# Market Trends



Markets becoming more complex and are shifting

- n Screen-based intraday trading has stepped back relative to automated trading models
- n Algorithmic trading has become mainstream
- n Speed and latency are thus even more important factors in maximizing profitability
- n Consequently, search for new strategies and operational and financial risk management is more dependent on extensive data analysis
  - n Extensive amounts of data are important to understanding market behaviour and for back testing strategies
  - n In depth and comprehensive order book data are required

# Product Offering



Eurex and Deutsche Börse – Market Data & Analytics provide tools to help market participants meet their needs

- n Eurex® Historical Order Book data (with full depth) now available
  - n Timestamps with accuracy of 10 milliseconds
  - n Reliable data
  - n Data feed in a format easy to upload into proprietary models
- n Eurex® Historical Order Book data allows for
  - n In-depth market analysis to examine the micro structure of the order book
  - n Order book replay, view full order book depth in all products and series
  - n Order impact reproduction
  - n Optimisation and development of new trading strategies especially of automated models

# Screenshot of a Eurex Order Book



Contract Overview - FDAX DEC07

Window Select Trading Columns Help

Exch: XEUR Contract: FDAX DEC07

Phase	NetChg	LstPrc	LstQty	High	Low	LstAuctPrc	PrvStlPrc	Volume	Update
TRAD	-8,0	7.977,0	1	8.017,5	7.969,0	8.006,5	7.974,50	34.750	dynamic

BidAvg	BidAcc	BidQty	Bid	Ask	AskQty
7.976,0	9	9	7.976,0	7.977,0	6
7.975,7	23	14	7.975,5	7.977,5	6
7.975,6	27	4	7.975,0	7.978,0	29
7.975,3	35	8	7.974,5	7.978,5	14
7.974,9	50	15	7.974,0	7.979,0	25
7.974,4	79	29	7.973,5	7.979,5	13
7.973,6	189	110	7.973,0	7.980,0	8
7.973,5	204	15	7.972,5	7.980,5	23
7.973,3	232	28	7.972,0	7.981,0	27
7.973,2	251	19	7.971,5	7.981,5	9

XEUR ⓘ 00000 SUCCESSFUL COMPLETION

# Product Features



Product offering includes historical order book data for Eurex products

- n Participants can choose to receive data for selected products as per the packages available
- n They can also opt for the complete year or choose particular months

Historical data currently is available for the calendar year 2007. Further data will be made available soon

- n Data will include all order book information (full depth) aggregated at 10 milliseconds intervals and will be fully anonymous
- n Additional order book analytics are included at no extra cost

# Available Product Packages



Eurex Historical Order Book data is offered in the following convenient packages that can be ordered separately:

## All Eurex® Derivatives

[www.eurexchange.com/trading/products\\_en.html](http://www.eurexchange.com/trading/products_en.html)

containing

Interest Rate Derivatives

Equity-based Derivatives

containing

containing

Interest Rate  
Futures

Interest Rate  
Options on  
Futures

Equity Index  
and ETF  
Derivatives

Equity Options  
and Single  
Stock Futures

## All CFTC-approved Derivatives

[www.eurexchange.com/trading/products/cftc\\_approved\\_en.html](http://www.eurexchange.com/trading/products/cftc_approved_en.html)

## Highly liquid CFTC-approved Derivatives

includes all Fixed Income Futures and Options on Futures + FDAX and FESX

# Quantitative Environment



Number of Eurex products/ series (as of June 08)

n Products 1,016

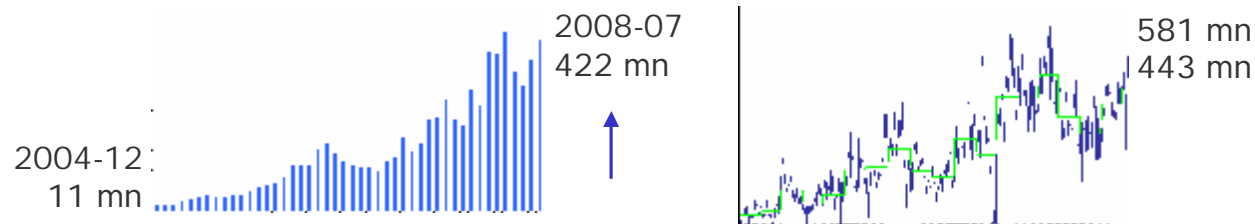
n Series 106,586

	# products	# series
1/1/2005	317	52,682
6/30/2008	1,016	106,586

Number of order and quote transitions

n Timeseries: 11 mn Nov/05 to 422 mn Jun/08

n Peaks: 581 mn Jan/08, 531 mn Jul/08



Quantitative structure of Eurex Historical Order Book

n CFTC approved Eurex derivatives: 3 GB Apr/08

# Product Specifications



## Order Interval and Trades

- n The order price and size lifecycle will be provided in terms of intervals with a start and end timestamp for all orders and quotes with the same order price, same order execution restrictions (order type) that are within the specified interval
  - n The following orders qualify for the aggregation: Limit orders with no order execution restriction that have been entered on previous business days and are still valid or on the current business day and all quotes of the respective business day.
  - n A “zero quantity” record with interval start and end timestamp is provided when an order price ceases to exist.
- n Trades are recorded with buy/sell indicator and an indicator which was the price taker side
- n An indicator whether the trade was a combination (spread/options strategy)
- n Combinations (spreads/strategies) to be added in 2009

## Series Information

- n Reference data information on a series level including ISIN of the underlying, last capital adjustment date and trade unit numbers are provided

# Product Specifications



## Analytics

- n Daily contract sheet information including the day's high and low, opening and closing auction price, settlement price, number of orders by order type and number of order events, and open interest is provided

## Market Status

- n The various trading phases, i.e. Trade, Fast Market and Market Reset with start and end timestamp are provided

# How Data is Captured

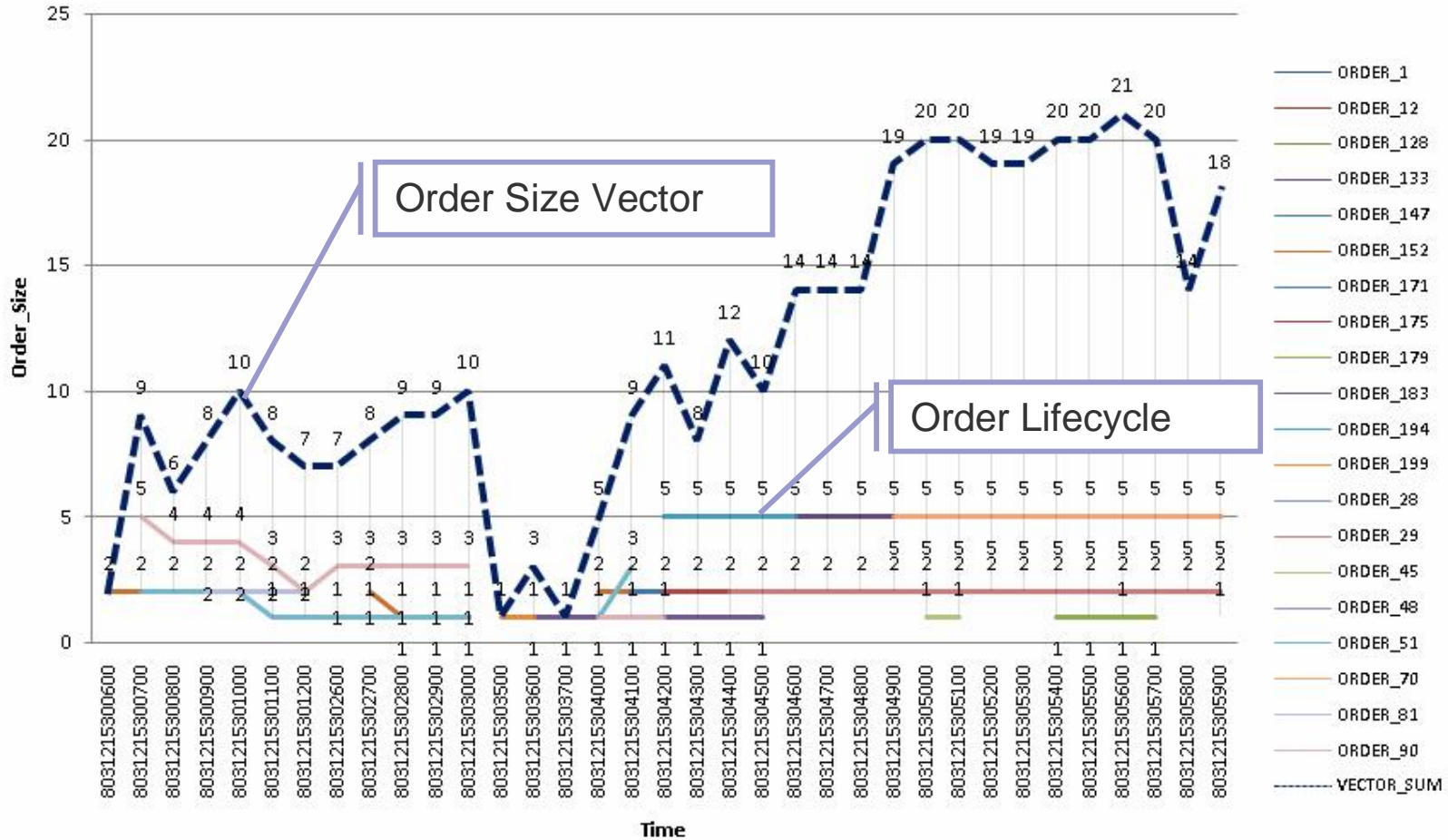


- n Orders in the sense of the Historical Order Book are given by bid/ ask and order price. The order price lifecycle is calculated for all orders and quotes of the same limit and with the same order execution restrictions, the variables are the cumulated size and the number of participants' orders.
- n Limit orders with no order execution restriction and all quotes of the respective business day qualify for aggregation.
- n Order price and size records are equipped with an interval start and interval end time point. This allows for an easy selection of all relevant information to be considered in a specific point in time for order book replay purposes.
- n A "zero quantity" record is provided when an order ceases to exist for a time period in order to simplify the order book replay processes.
- n Trades are given in the order file in the time sequence of order transitions with an indication which side was the price taker (aggressive/ passive flag).
- n The following diagrams are for illustration purposes and do not cover all possible scenarios.

# How Data is Captured – Order Records



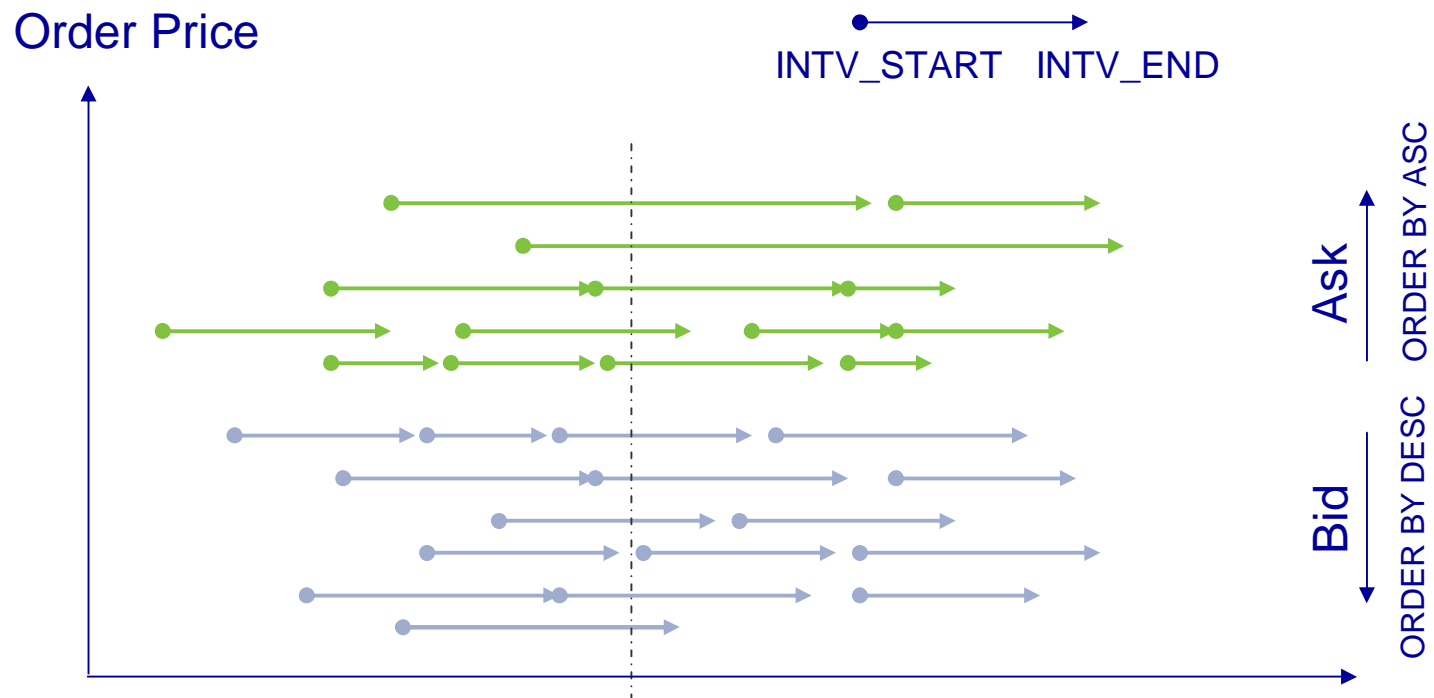
FDAX 2008-03 @ Price 6600



# Rebuild Process – Results (II/II)



This diagram shows how to fetch orders for order book replay in a specific time point.



T: = time point for reconstruction  
fetch all records with  $T \geq \text{INTV\_START}$  and  $T < \text{INTV\_END}$

# Historical Order Book – Order and Trades Records



```
#TRANS_TYPE,SERIES_ID,PRODUCT_BUSINESS_ID,CALL_PUT_FLAG,EXP_MONTH,EXERCISE_PRICE_DC,VERSION,GENERATION,BUY_SE
LL_IND,COMB_IND,ORDER_PRICE,INTV_START,INTV_END,INTV_LENGTH,ORDER_SIZE,NBR_OF_ORDERS,AGGR_O_IND
O,53127601,FDAX,,200806,,0,0,B,N,6740,80304080124260,80304104535550,985129,1,1,
O,53127601,FDAX,,200806,,0,0,S,N,6905,80304080150370,80304080207820,1745,1,1,
O,53127601,FDAX,,200806,,0,0,S,N,6800,80304080233570,80304092935500,522193,1,1,
O,53127601,FDAX,,200806,,0,0,S,N,6831,80304080349330,80304154524140,2769581,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6774,80304080532950,80304080549040,1609,1,1,
T,53127601,FDAX,,200806,,0,0,B,N,6774,80304080549040,,1,1,A
T,53127601,FDAX,,200806,,0,0,S,Y,6774,80304080549040,,1,1,P
O,53127601,FDAX,,200806,,0,0,S,N,6775,80304080619290,80304080726190,6690,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6774,80304080703830,80304081249240,34541,3,1,
T,53127601,FDAX,,200806,,0,0,B,Y,6775,80304080726190,,1,1,P
T,53127601,FDAX,,200806,,0,0,S,N,6775,80304080726190,,1,1,A
O,53127601,FDAX,,200806,,0,0,B,N,6637,80304080812960,80304164413560,309600,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6775.5,80304080828590,80304080954820,8623,1,1,
O,53127601,FDAX,,200806,,0,0,S,N,6852.5,80304080834260,80304220000050,4988579,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6775.5,80304081130530,80304081219260,4873,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6775.5,80304081841300,80304082238680,23738,1,1,
T,53127601,FDAX,,200806,,0,0,B,N,6775.5,80304082238680,,1,1,A
T,53127601,FDAX,,200806,,0,0,S,Y,6775.5,80304082238680,,1,1,P
O,53127601,FDAX,,200806,,0,0,S,N,6780,80304082255660,80304082549740,17408,1,1,
T,53127601,FDAX,,200806,,0,0,B,N,6774.5,80304082429310,,2,1,A
T,53127601,FDAX,,200806,,0,0,B,N,6774,80304082429310,,3,1,A
T,53127601,FDAX,,200806,,0,0,S,Y,6774,80304082429310,,3,1,P
T,53127601,FDAX,,200806,,0,0,S,Y,6774.5,80304082429310,,2,1,P
O,53127601,FDAX,,200806,,0,0,S,N,6778,80304082629460,80304082754780,8532,1,1,
O,53127601,FDAX,,200806,,0,0,B,N,6755,80304082937810,80304090414450,207664,1,1,
O,53127601,FDAX,,200806,,0,0,S,N,6780,80304083002740,80304083629670,38693,1,1,
```

Transaction Type

Series Identification

Buy/ Sell Indicator

Order/ Trade Price

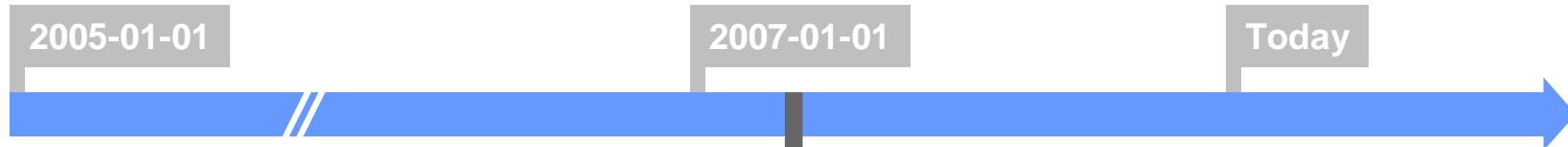
- 1. Interval Start Time resp. Execution Time
- 2. Interval End Time
- 3. Interval Length

- 1. Number of Contracts
- 2. Number of Orders

Aggressive/ Passive Indicator

Combination Trade Indicator

# Order Book History - Example



Product: FDAX  
Series: Jun 2007  
Order Book: 20070511 10:03:58 00

LEVEL	Bid Qty	Bid Price	Ask Price	Ask Qty
1	14	7387.50	7388.00	5
2	13	7387.00	7388.50	14
3	12	7386.50	7389.00	12
4	7	7386.00	7389.50	16
...	...	...	...	...
n	1	6902.00	8100.00	24

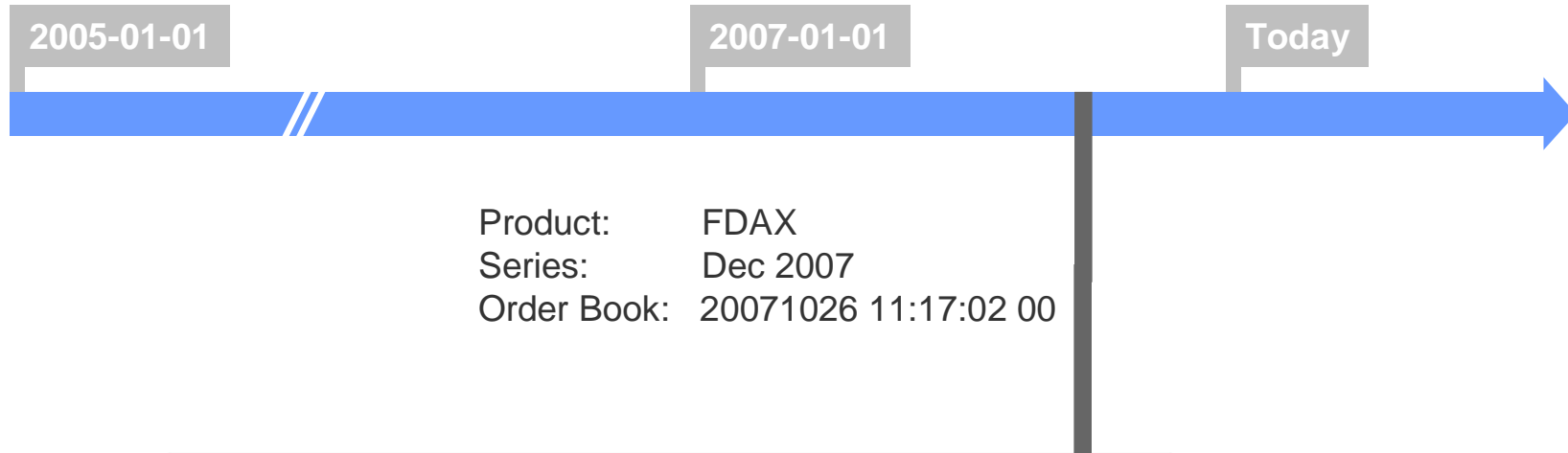
# Order Book History - Example



Product: FDAX  
Series: Sep 2007  
Order Book: 20070827 16:32:21 00

LEVEL	Bid Qty	Bid Price	Ask Price	Ask Qty
1	3	7599.00	7662.00	3
2	2	7580.00	7669.00	1
3	5	7550.00	7694.00	1
4	1	7540.00	7700.00	3
...	...	...	...	...
n	1	7501.00	8152.00	12

# Order Book History - Example



LEVEL	Bid Qty	Bid Price	Ask Price	Ask Qty
1	9	7976.00	7977.00	6
2	14	7975.50	7977.50	6
3	4	7975.00	7978.00	29
4	8	7974.50	7978.50	11
...	...	...	...	...
n	24	7962.50	7990.50	4

# Pricing Discounts Are Available When Purchasing Multiple Packages



## All Eurex Derivatives

- n All Eurex derivatives

Per historical year/ Per month

EUR 50,000/EUR 5,000

## Eurex Interest Rate Derivatives

- n All interest rate derivatives
- n All interest rate futures
- n All interest rate options on futures

EUR 25,000/EUR 2,500

EUR 20,000/EUR 2,000

EUR 20,000/EUR 2,000

# Pricing Discounts Are Available When Purchasing Multiple Packages



## Eurex Equity-Based Derivatives

Per historical year/ Per month

- n All equity-based derivatives

EUR 25,000/EUR 2,500

- n All equity index derivatives and ETF derivatives

EUR 20,000/EUR 2,000

- n Highly liquid equity index derivatives

EUR 20,000/EUR 2,000

- n Equity derivatives (equity options and SSFs)

EUR 20,000/EUR 2,000

## Eurex CFTC-Approved Derivatives

- n All CFTC-approved derivatives

EUR 25,000/EUR 2,500

- n Highly liquid CFTC-approved products

EUR 25,000/EUR 2,500

# Pricing Discounts Are Available When Purchasing Multiple Packages



## Discount

Per historical year/ Per month

- n With purchase of two or more packages  
EUR 5,000/EUR 500
- n With purchase of one historical year and one year  
3 months of current data  
(same package)  
data free of charge

# Contacts



## Market Data & Analytics

Chicago

Craig Dalrymple

T +1 312-544-1095

[craig.dalrymple@deutsche-boerse.com](mailto:craig.dalrymple@deutsche-boerse.com)

Frankfurt

Karen Lenz

T +49-69-211-1 48 39

[karen.lenz@deutsche-boerse.com](mailto:karen.lenz@deutsche-boerse.com)

**Thank you for your attention!**

