

# Advanced Corporate Finance Event study

Analytics Group

[analytics@asb.dk](mailto:analytics@asb.dk)

# Agenda

## Short introduction to an event study

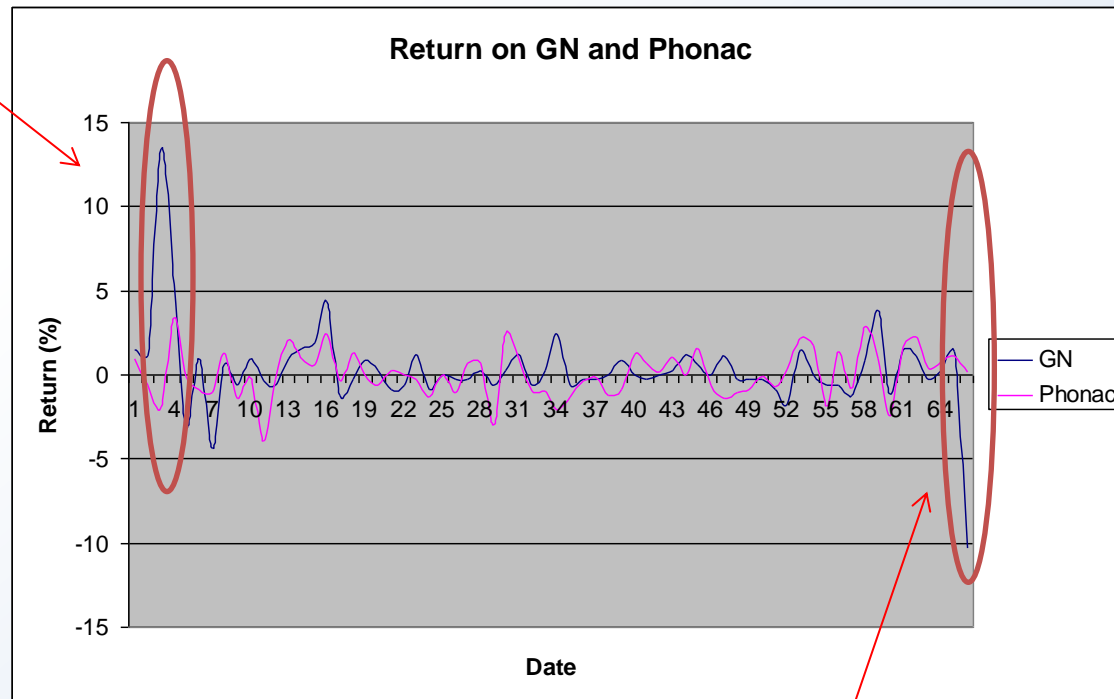
- Zephyr: Locate the events
- DataStream: Extract stock data

All topics will will be covered by a program introduction

# Event Study

- Event studies are a way to investigate how the market responds to new information
- The purpose of an event study is to investigate the economic consequence of an event as measured by a change in price of a traded asset

GN announces the indented sale of hearing aid division



# Event Study

## What events?

- Company specific announcements: earnings announcement, debt issuance, stock splits, dividend announcements, mergers & acquisitions
- It could also be market wide events. Changes in regulation (example Basel II) or the announcement of key macroeconomic figures (inflation, consumption etc.).

Test the Null hypothesis

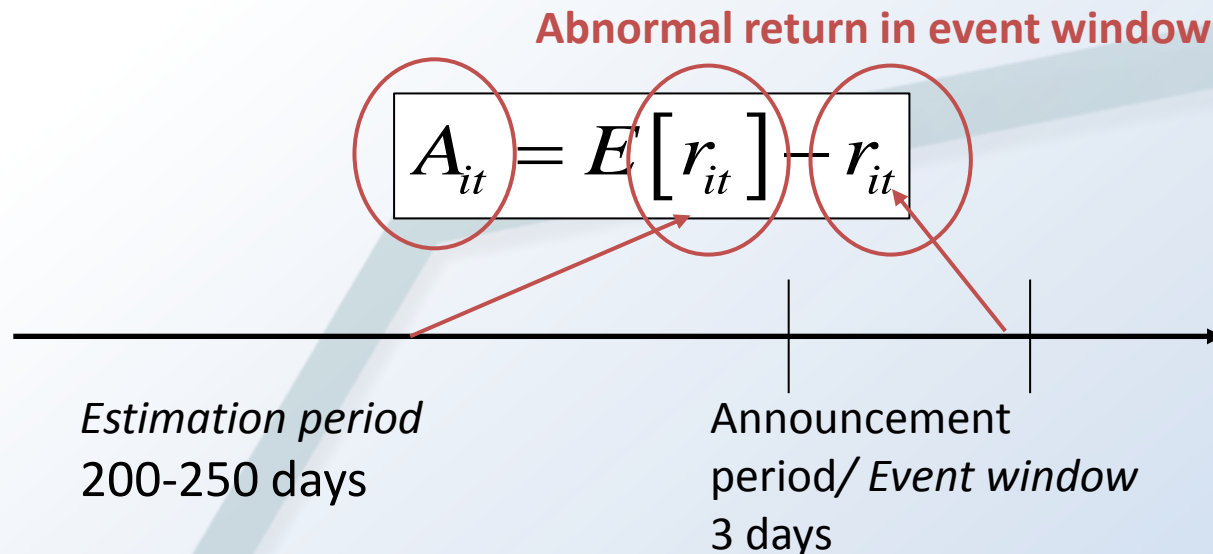
**$H_0$ : Event has no impact on returns in the event window**

**Or (written in another way)**

**$H_0$ : Event has no impact on the distribution of returns**

# Measurement of abnormal return

- We estimate the expected return before the public announcement (*estimation period*)
- We estimate the abnormal return for each days in the announcement period (*event window*)



# Event Window

We calculate abnormal returns for each day in the event window (normally three days):

$$A_{it} = E[r_{it}] - r_{it}, t = -1, 0, 1$$

t= -1: The day before the official announcement day

t= 0: The official announcement day

t=+1: Day after the official announcement day

By using different test statistics we can now test for the significance of the event (more on this later)

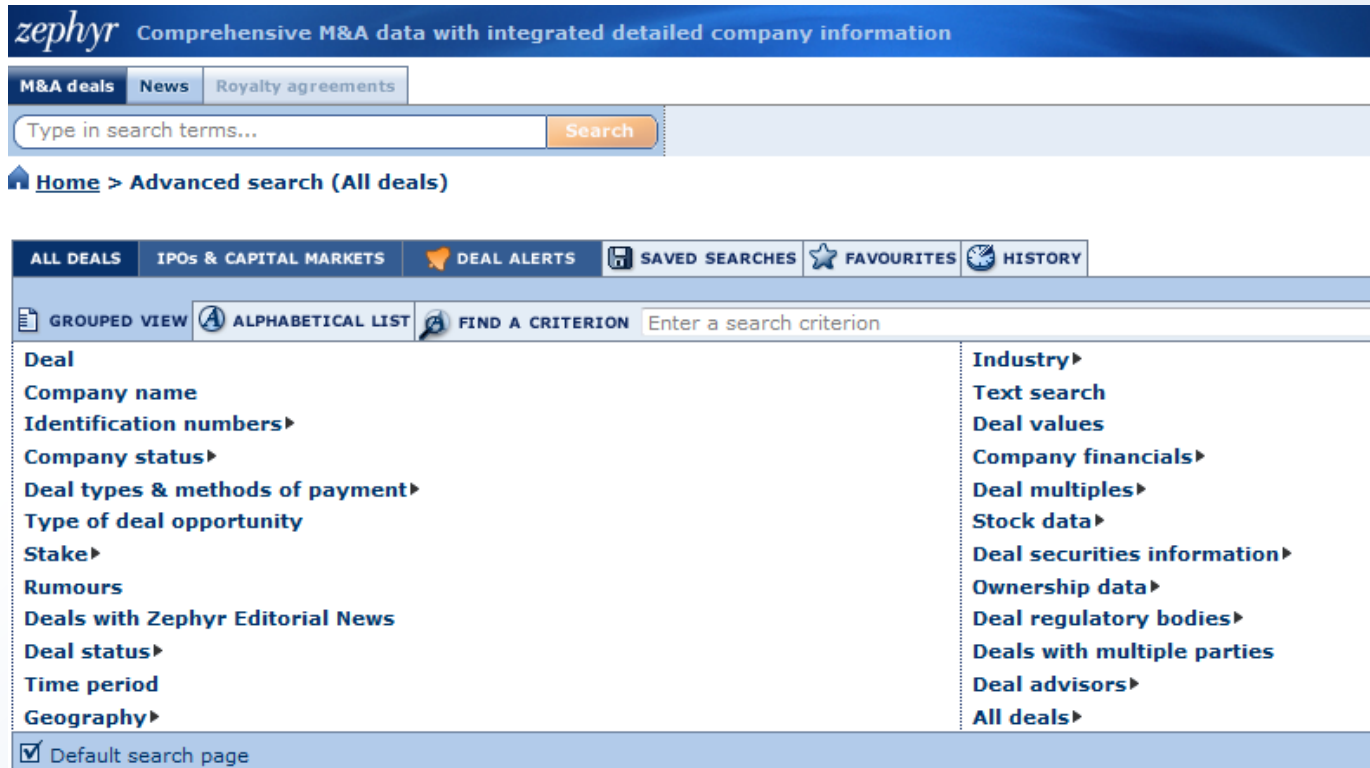
# Zephyr

To locate the events we use Zephyr:

- Database with mergers, acquisitions, IPOs and venture capital transactions
- “Zephyr contains detailed information on M&A, IPO and venture capital deals with links detailed financial company information. The database has 5 years global coverage but the coverage of deals involving European and American companies goes back to 1997. Zephyr includes almost 600,000 transactions (June 2008) and up to 100,000 deals are added each year.”
- Access through the library’s database page ([lib.asb.dk](http://lib.asb.dk))
- From home: [www.baser.dk](http://www.baser.dk)

# Zephyr

Through lib.asb.dk



The screenshot shows the Zephyr web interface. At the top, a blue banner reads "zephyr Comprehensive M&A data with integrated detailed company information". Below this is a navigation bar with tabs for "M&A deals", "News", and "Royalty agreements". A search bar with the placeholder "Type in search terms..." and a "Search" button is present. Below the search bar, a breadcrumb trail shows "Home > Advanced search (All deals)". The main interface has a top navigation bar with tabs: "ALL DEALS", "IPOs & CAPITAL MARKETS", "DEAL ALERTS", "SAVED SEARCHES", "FAVOURITES", and "HISTORY". Below this is a section for search criteria with tabs for "GROUPED VIEW", "ALPHABETICAL LIST", and "FIND A CRITERION". A search bar with the placeholder "Enter a search criterion" is next to these tabs. The search results are displayed in two columns. The left column lists various deal attributes: "Deal", "Company name", "Identification numbers", "Company status", "Deal types & methods of payment", "Type of deal opportunity", "Stake", "Rumours", "Deals with Zephyr Editorial News", "Deal status", "Time period", and "Geography". The right column lists various deal types: "Industry", "Text search", "Deal values", "Company financials", "Deal multiples", "Stock data", "Deal securities information", "Ownership data", "Deal regulatory bodies", "Deals with multiple parties", "Deal advisors", and "All deals". At the bottom of the search results section, there is a checkbox labeled "Default search page" which is checked.

**zephyr** Comprehensive M&A data with integrated detailed company information

M&A deals News Royalty agreements

Type in search terms... Search

Home > Advanced search (All deals)

ALL DEALS IPOs & CAPITAL MARKETS DEAL ALERTS SAVED SEARCHES FAVOURITES HISTORY

GROUPED VIEW ALPHABETICAL LIST FIND A CRITERION Enter a search criterion

**Deal**

- Company name
- Identification numbers
- Company status
- Deal types & methods of payment
- Type of deal opportunity
- Stake
- Rumours
- Deals with Zephyr Editorial News
- Deal status
- Time period
- Geography

**Industry**

- Text search
- Deal values
- Company financials
- Deal multiples
- Stock data
- Deal securities information
- Ownership data
- Deal regulatory bodies
- Deals with multiple parties
- Deal advisors
- All deals

☒ Default search page



# Event example using Zephyr

- Issue: We need a number of events and information regarding the company and the date for the event.
- Example: Effect on the acquirer of a take over.
- Selection Criteria:
  - Danish and quoted acquirer
  - Minimum deal value = 500 million €
  - The deal value should be known
  - Time period 2004 until now

SEARCH STRATEGY		Alert me	Save	Print	Clear all steps
		Step result	Search result		
<input checked="" type="checkbox"/>	1. <u>Time period: 2004 - Until current date (announced)</u>	715,906	715,906		
<input checked="" type="checkbox"/>	2. <u>Listed/Unlisted/Delisted companies: listed acquiror</u>	223,992	157,157		
<input checked="" type="checkbox"/>	3. <u>Deal type: Acquisition</u>	435,983	81,817		
<input checked="" type="checkbox"/>	4. <u>Deal value (mil EUR): min=500 (including estimates)</u>	19,675	2,710		
<input checked="" type="checkbox"/>	5. <u>Deal value (EUR): all deals with known value (including estimates)</u>	586,066	2,710		
<input checked="" type="checkbox"/>	6. <u>Country: Denmark (DK) ( Acquiror )</u>	7,886	9		
Boolean search 1 And 2 And 3 And 4 And 5 And 6 <input type="button" value="Refresh"/> <input type="button" value="?"/>				TOTAL : 9	
		<input type="button" value="Launch wizard"/> <input type="button" value="Summary records"/> <input type="button" value="View list of deals"/>			

Click to get a list overview of the 9 deals

# Zephyr – Event example

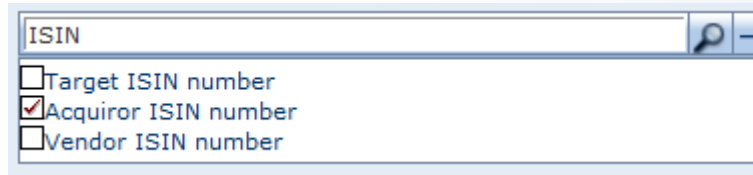
Check each deal to see whether or not these are in coherence with the filter from the past slide

9 Deals							€ Currency	Columns	Save	Delete
		Deal Number	Acquiror name	Acquiror country code	Target name	Target country code	Deal type			
1.	X	 <a href="#">126520</a>	DANSKE BANK A/S	DK	SAMPO PANKKI OYJ	FI	Acquisition 100%			
2.	X	 <a href="#">342764</a>	AP MØLLER-MÆRSK A/S	DK	ROYAL P&O NEDLLOYD NV	NL	Acquisition 100%			
3.	X	 <a href="#">226879</a>	CARLSBERG A/S	DK	CARLSBERG BREWERIES A/S	DK	Acquisition increased from 60...			
4.	X	 <a href="#">531794</a>	TEEKAY SHIPPING CORPORATION	MH	OMI CORPORATION	US	Acquisition 100%			
5.	X	 <a href="#">224121</a>	DANSKE BANK A/S	DK	NATIONAL IRISH BANK LTD	IE	Acquisition			
6.	X	 <a href="#">1601019220</a>	SPAR NORD BANK A/S	DK	BANKAKTIESELSKABET AF AUG. 24, 2008'S 21 BRANCHES	DK	Acquisition 100%			
7.	X	 <a href="#">621591</a>	DSV A/S	DK	XB LUXEMBOURG HOLDINGS 1 SA	LU	Acquisition 100%			
8.	X	 <a href="#">534603</a>	FLSMIDTH & CO A/S	DK	GROUPE LAPERRIÈRE & VERREAUULT INC.'S PROCESS GROUP	CA	Acquisition 100%			
9.	X	 <a href="#">427403</a>	FLSMIDTH & CO A/S	DK	POTAGUA FLS A/S	DK	Acquisition 100%			

# Zephyr – Event example

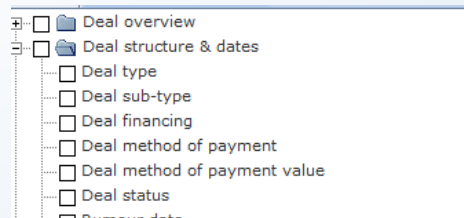
Modify the details to be shown for each deal by clicking 

To obtain stock prices in Datastream we need the ISIN number of the acquirer



A screenshot of a web-based dialog box for selecting ISIN numbers. At the top is a text input field containing the word "ISIN" and a search icon. Below the input field are three checkboxes with labels: "Target ISIN number" (unchecked), "Acquiror ISIN number" (checked), and "Vendor ISIN number" (unchecked).

The Announcement date is of interest and should also be displayed in the output.



A screenshot of a tree view in the Zephyr interface. The tree has two main categories: "Deal overview" and "Deal structure & dates". Under "Deal overview", there are several sub-items, each with a checkbox: "Deal type", "Deal sub-type", "Deal financing", "Deal method of payment", "Deal method of payment value", "Deal status", and "Announcement date". The "Announcement date" checkbox is checked.

Click on  in order to download the table as an Excel file.

# Zephyr – Event example

We now have the required data for Datastream

D	E	F	G	H	I	J	K
Acquiror country code	Target name	Target country code	Deal type	Deal status	Deal value th EUR	Acquiror ISIN number	Announced date
DK	SAMPO PANKKI OYJ	FI	Acquisition 100%	Completed	4,050,000.00*	DK0010274414	09-11-2006
DK	ROYAL P&O NEDLLOYD NV	NL	Acquisition 100%	Completed	2.300.000,00	DK0010244508	10-06-2005
DK	CARLSBERG BREWERIES A/S	DK	Acquisition increased	Completed	1.986.583,78	DK0010181759	19-02-2004
MH	OMI CORPORATION	US	Acquisition 100%	Completed	1,645,600.00*	MHY8564W1030 DK0060082915	17-04-2007
DK	NATIONAL IRISH BANK LTD	IE	Acquisition	Completed	1.484.589,98	DK0010274414	15-12-2004
DK	BANKAKTIESELSKABET AF AUG. 24, 2008'S 21 BRANCHES	DK	Acquisition 100%	Pending - awaiting	1.336.770,36	DK0060036564 SE0000427361	29-09-2008
DK	XB LUXEMBOURG HOLDINGS 1 SA	LU	Acquisition 100%	Completed	750.000,00	DK0060079531	21-06-2008
DK	GROUPE LAPERRIÈRE & VERREAULT INC.'S PROCESS GROUP	CA	Acquisition 100%	Completed	656,386.62*	DK0010234467	20-04-2007
DK	POTAGUA FLS A/S	DK	Acquisition 100%	Completed	510,015.75*	DK0010234467	13-03-2006

# Datastream

- Datastream can be found on all computers in the computer labs (H)
- Accessed through:
  - Add-in for Excel →
- Database with financial data
- Only a very limited number of users can access data at the same time – might give some problems if all are trying to access data at the same time.
- Please don't open up Datastream during the presentation!

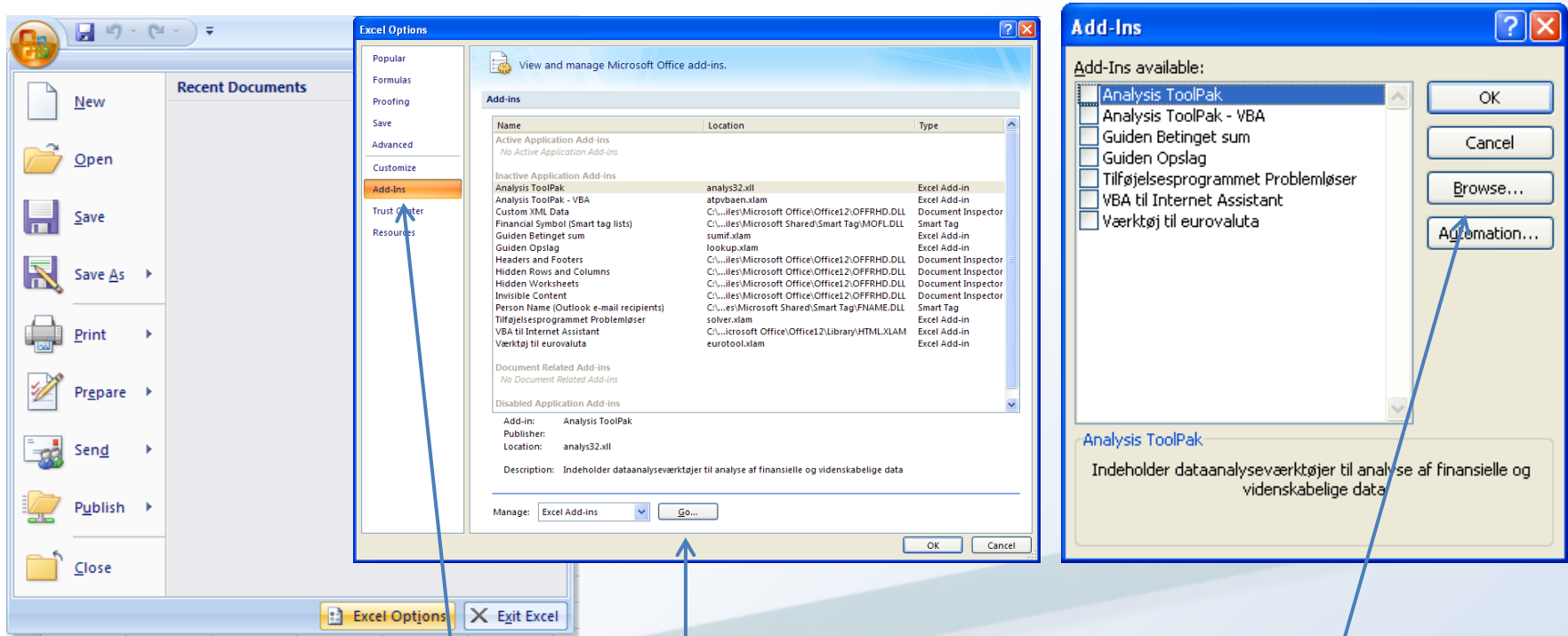
# Data categories

- Equities
- Equity Indices
- Exchange rates
- Commodities
- Interest rates
- Bonds and Convertibles / Bond indices
- Credit Default Swaps
- Economics (growth, inflation etc.)
- I/B/E/S Broker estimates (Datatype: Equities)
- Unit trusts
- Futures/Options

# Excel Add in

- Datastream access through an Excel add-in
- Advantages:
  - Data is delivered directly to the Excel spreadsheet
  - Date format and Danish/English comma style
  - Easy to access data for many instruments at one time
  - Remember to save as macro enabled workbook

# How to add the Add-in



1. Press Excel Options

2. Press Add Ins

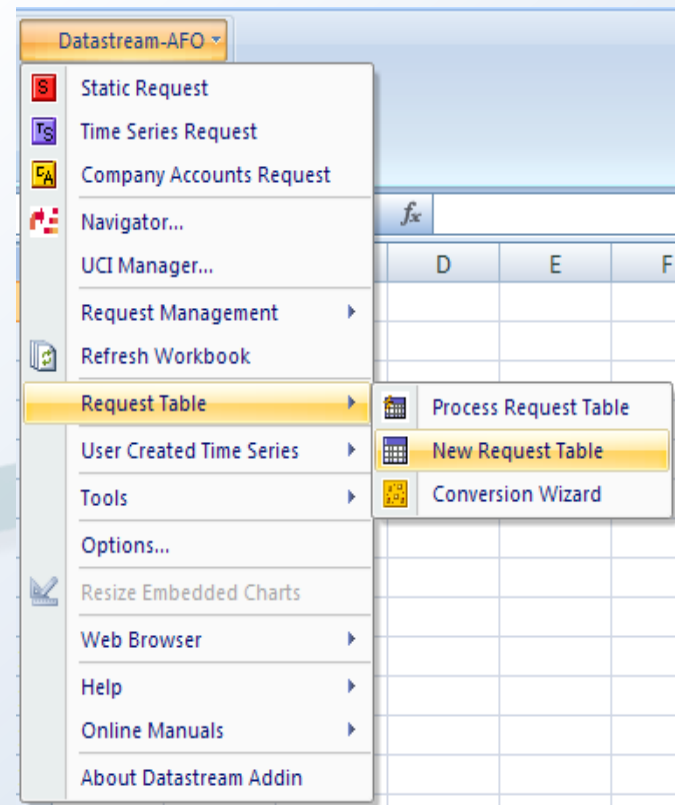
3. Press Go

4. Press Browse.. and open C:\Program Files\Datastream\Datastream Advance\AdvanceOffice.xla





# Request table

- The most usefull tool in Datastream
- Possible to get large amount of data into excel
- Ensures right date and comma type
- Therefore: **always use this tool!**



# How to fill out the request table I

Update	Request Type					Format	Series Lookup	
Yes/No	S	TS	TSL	CAF	CH	Select Format		
YES	TS					HRC	DK:NON, DK:DSV	

*Should the table be updated when pressing "process table"*

*Which format?*

Eg. should the table have headers.  
Press "Select format" to see the possible settings

*Which series are requested?*

Press the red arrow to search  
Press the magnifier to use a list

Static data request




Time series data request

Time series list data request (used for constituent lists)

Company accounts data request

Chart request

# How to fill out the request table II

Datatype/Expressions/CAF Lookup	Start Date	End Date	Freq	Data Destination
  			Weekly	
P, DY	-1y		Weekly	Sheet1!\$A\$1

*Which datatype(s) is/are requested?*

Eg.: P=price,  
 DEFT=default.  
 Press the magnifier to  
 search for datatypes.  
 Fx: Calculate  
 expressions eg. Moving  
 average  
 CA: used for CAF  
 requests

*Which time interval?*

Hold the cursor over Start  
 Date to see possible  
 definitions

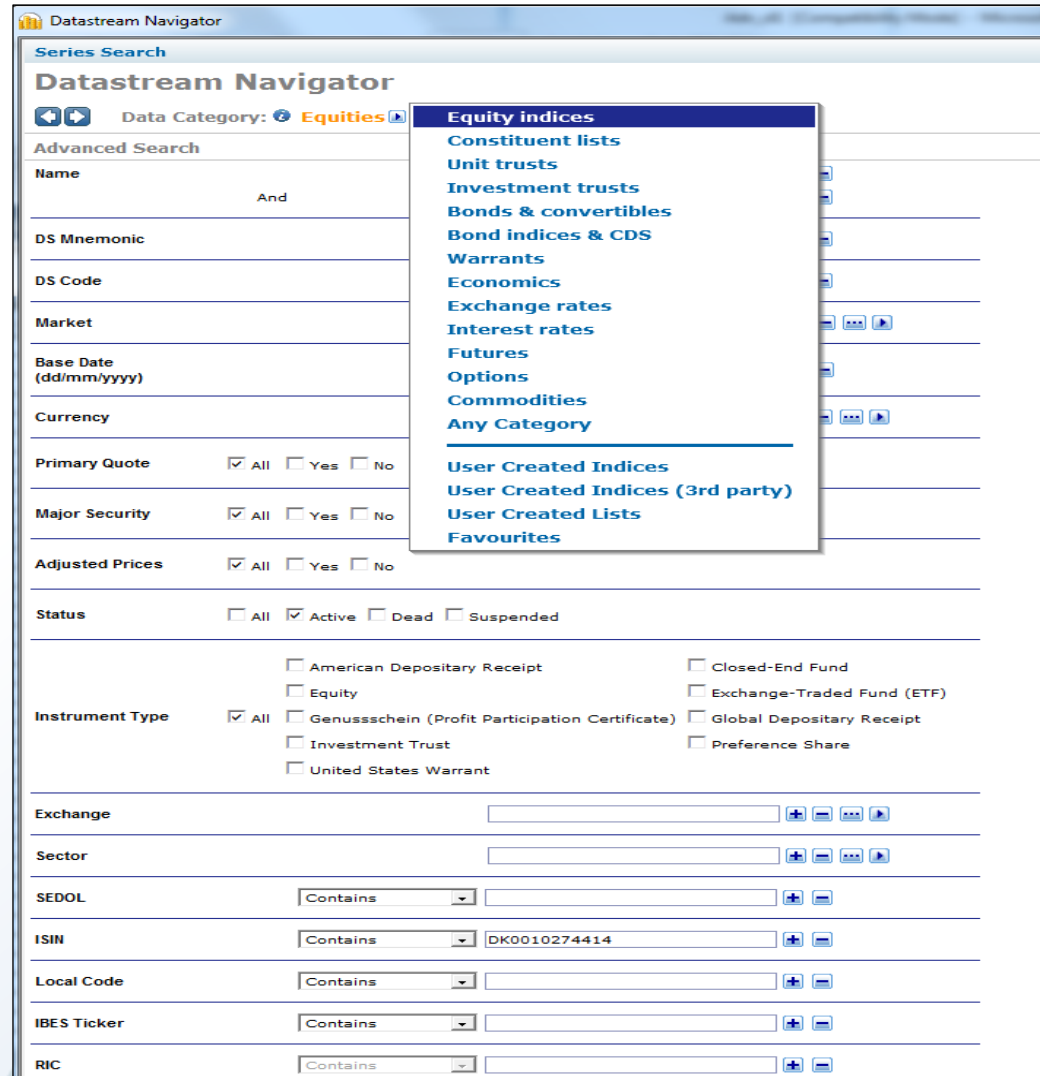
*Where should the data be placed?*

If nothing is specified a new sheet will be  
 made

# Search menu

Start: Select data category

Type in name of company e.g. Novo Nordisk  
 Or use different criteria



The screenshot shows the 'Datastream Navigator' application window. The 'Series Search' section is active, displaying a 'Data Category' dropdown set to 'Equities'. An arrow points from the 'Start: Select data category' text to this dropdown. Below the category, an 'Advanced Search' form is visible with fields for Name, DS Mnemonic, DS Code, Market, Base Date, Currency, Primary Quote, Major Security, Adjusted Prices, Status, Instrument Type, Exchange, Sector, SEDOL, ISIN, Local Code, IBES Ticker, and RIC. Another arrow points from the 'Type in name of company e.g. Novo Nordisk' text to the 'Name' field. A dropdown menu is open next to the 'Equities' category, listing various financial instruments and indices. The list includes 'Equity indices' (with sub-items like Constituent lists, Unit trusts, etc.), 'User Created Indices', and 'Favourites'.

**Datastream Navigator**

Series Search

Data Category: **Equities**

**Equity indices**

- Constituent lists
- Unit trusts
- Investment trusts
- Bonds & convertibles
- Bond indices & CDS
- Warrants
- Economics
- Exchange rates
- Interest rates
- Futures
- Options
- Commodities
- Any Category

**User Created Indices**

- User Created Indices (3rd party)
- User Created Lists
- Favourites

**Advanced Search**

Name: \_\_\_\_\_ And \_\_\_\_\_

DS Mnemonic: \_\_\_\_\_

DS Code: \_\_\_\_\_

Market: \_\_\_\_\_

Base Date (dd/mm/yyyy): \_\_\_\_\_

Currency: \_\_\_\_\_

Primary Quote: ☒ All ☐ Yes ☐ No

Major Security: ☒ All ☐ Yes ☐ No

Adjusted Prices: ☒ All ☐ Yes ☐ No

Status: ☐ All ☒ Active ☐ Dead ☐ Suspended

Instrument Type: ☒ All

- ☐ American Depositary Receipt
- ☐ Equity
- ☐ Genusschein (Profit Participation Certificate)
- ☐ Investment Trust
- ☐ United States Warrant
- ☐ Closed-End Fund
- ☐ Exchange-Traded Fund (ETF)
- ☐ Global Depositary Receipt
- ☐ Preference Share

Exchange: \_\_\_\_\_

Sector: \_\_\_\_\_

SEDOL: Contains \_\_\_\_\_

ISIN: Contains \_\_\_\_\_ DK0010274414

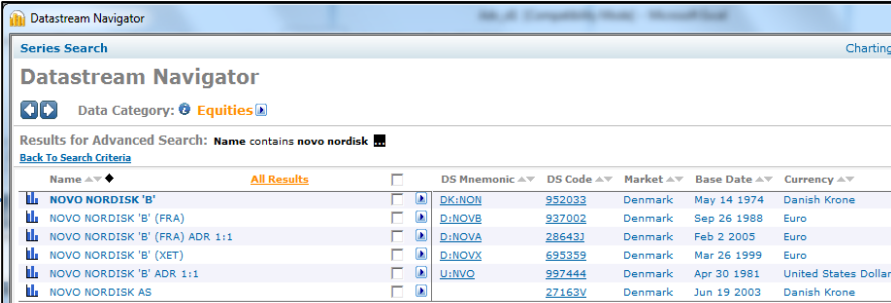
Local Code: Contains \_\_\_\_\_

IBES Ticker: Contains \_\_\_\_\_

RIC: Contains \_\_\_\_\_

# Search menu

Select Novo Nordisk 'B'

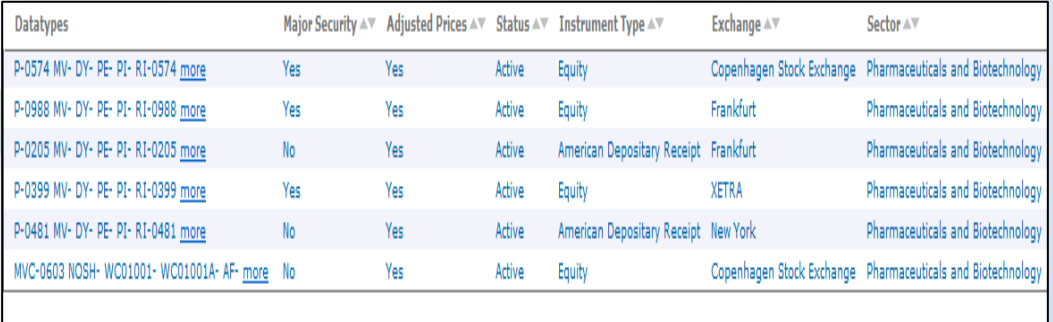


The screenshot shows the 'Datastream Navigator' interface. The 'Series Search' tab is active, displaying results for the search criteria 'Name contains novo nordisk'. The results table lists several series, with 'NOVO NORDISK 'B'' selected. The table columns include Name, All Results, DS Mnemonic, DS Code, Market, Base Date, and Currency.

Name ▲▼	All Results	DS Mnemonic ▲▼	DS Code ▲▼	Market ▲▼	Base Date ▲▼	Currency ▲▼
<b>NOVO NORDISK 'B'</b>	<input checked="" type="checkbox"/>	DK:NON	952033	Denmark	May 14 1974	Danish Krone
NOVO NORDISK 'B' (FRA)	<input type="checkbox"/>	D:NOVB	937002	Denmark	Sep 26 1988	Euro
NOVO NORDISK 'B' (FRA) ADR 1:1	<input type="checkbox"/>	D:NOVA	286433	Denmark	Feb 2 2005	Euro
NOVO NORDISK 'B' (XET)	<input type="checkbox"/>	D:NOVX	695359	Denmark	Mar 26 1999	Euro
NOVO NORDISK 'B' ADR 1:1	<input type="checkbox"/>	U:NOVQ	997444	Denmark	Apr 30 1981	United States Dollar
NOVO NORDISK AS	<input type="checkbox"/>		27163V	Denmark	Jun 19 2003	Danish Krone

Datatypes specifies which datatypes that are available for the specific instrument. For example price, EPS, dividend and market value.

A complet list can be found by pressing "more"



The screenshot shows a table of datatypes for the selected instrument. The table columns include Datatypes, Major Security, Adjusted Prices, Status, Instrument Type, Exchange, and Sector. Each row represents a different datatype, with a 'more' link available for each.

Datatypes	Major Security ▲▼	Adjusted Prices ▲▼	Status ▲▼	Instrument Type ▲▼	Exchange ▲▼	Sector ▲▼
P-0574 MV- DY- PE- PI- RI-0574 <a href="#">more</a>	Yes	Yes	Active	Equity	Copenhagen Stock Exchange	Pharmaceuticals and Biotechnology
P-0988 MV- DY- PE- PI- RI-0988 <a href="#">more</a>	Yes	Yes	Active	Equity	Frankfurt	Pharmaceuticals and Biotechnology
P-0205 MV- DY- PE- PI- RI-0205 <a href="#">more</a>	No	Yes	Active	American Depositary Receipt	Frankfurt	Pharmaceuticals and Biotechnology
P-0399 MV- DY- PE- PI- RI-0399 <a href="#">more</a>	Yes	Yes	Active	Equity	XETRA	Pharmaceuticals and Biotechnology
P-0481 MV- DY- PE- PI- RI-0481 <a href="#">more</a>	No	Yes	Active	American Depositary Receipt	New York	Pharmaceuticals and Biotechnology
MVC-0603 NOSH- WCO1001- WCO1001A- AF- <a href="#">more</a>	No	Yes	Active	Equity	Copenhagen Stock Exchange	Pharmaceuticals and Biotechnology

# Data types for a series

Possible datatypes for  
Novo Nordisk 'B'

Press the small  
book to get a  
description of the  
datatype

Notice that there can  
be more than one  
pages

DataStream Navigator

Selected series: NOVO NORDISK 'B' Mnemonic: DKNON

Find Name Contains And Name Contains Filter / Search Reset

Datatype All Static Time Series Headline Flag All No Yes MIFID All No Yes Price All No Yes Worldscope Report Type All Annual Interim

Name	Mnemonic	Worldscope Report Type	Start Date	Datatype	Worldscope Level	MIFID	Price Key	WS Item	Currency
Price (Adjusted - Default)	P		May 14 1974	Time Series	No	Yes		Yes	
Market Value (Capital)	MV			Time Series	No	No		Yes	
Dividend Yield	DY			Time Series	No	No		No	
Price/Earnings Ratio (Adjusted)	PE			Time Series	No	No		No	
Name	NAME			Static	No	No		No	
Mnemonic	MNEM			Static	No	No		No	
Code - Datastream	DSCD			Static	No	No		No	
Price Index	PI			Time Series	No	No		Yes	
Total Return Index	RI		May 14 1974	Time Series	No	No		Yes	
Code - Isin	ISIN			Static	No	No		No	
Code - Sedol	SECD			Static	No	No		No	
Price - Intraday High	PH		Oct 7 1991	Time Series	No	No		Yes	
Price - Intraday Low	PL		Oct 7 1991	Time Series	No	No		Yes	
Price - Opening	PO		Feb 6 1983	Time Series	No	No		Yes	
Unadjusted Price	UP			Time Series	No	No		Yes	
Price/Earnings Curr Year (18ES)	PE1			Time Series	No	No		No	
Price/Earnings Next Year (18ES)	PE2			Time Series	No	No		No	
EPS	EPS			Time Series	No	No		Yes	
Geographical Classification Of Company (Numeric Code)	GEOG			Static	No	No		No	
Geographical Classification Of Company (Alpha Code)	GEOGC			Static	No	No		No	
Geographical Classification Of Company (Name)	GEOGN			Static	No	No		No	
Code - Local	LOC			Static	No	No		No	
Market Value For Company	MVC		Jan 3 2000	Time Series	No	No		Yes	
Number Of Shares	NOSH			Time Series	No	No		No	
Unit Of Price - Adjusted	P.U			Static	No	No		No	
Price/Cash Earnings Ratio	PC			Time Series	No	No		No	
Price To Book Value	PTBV			Time Series	No	No		No	
Date - Dividend Payment	PVD			Time Series	No	No		Yes	
Turnover by Volume	VO		Oct 7 1991	Time Series	No	No		No	
Price - Currency	PCUR			Static	No	No		No	
Currency - Accounts	ACUR			Static	No	No		No	
Currency - Earnings	ECUR			Static	No	No		No	
Price Currency (ISO Code)	ISOCUR			Static	No	No		No	
Fiscal Year End for EPS1	EPS1D			Time Series	No	No		Yes	
Mean Earnings Per Share for FY2 (Freely Available)	EPS2			Time Series	No	No		Yes	
Fiscal Year End for EPS2	EPS2D			Time Series	No	No		Yes	
EPS - Last 12 Months Date	EPSD			Static	No	No		No	
EPS - Last Financial Year	EPSF			Static	No	No		No	
EPS - Last Financial Year Date	EPSFD			Static	No	No		No	
Mean Earnings Per Share for FY1 (Freely Available)	EPS1			Time Series	No	No		Yes	

Items 1-75 of 144

Back Page: 1 2 Next

### Dividend Yield – datatype (DY)

The dividend yield expresses the dividend per share as a percentage of the share price. The underlying dividend is calculated according to the same principles as datatype [DPS](#) (Dividend per share, current rate) in that it is based on an anticipated annual dividend and excludes special or once-off dividends.

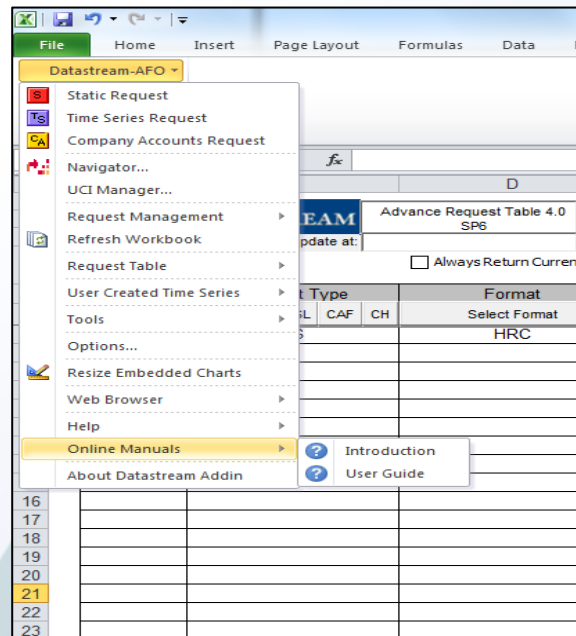
Dividend yield is calculated on gross dividends (including tax credits) where available. Note that dividend yield for UK, Irish and French stocks is calculated on gross dividends (including tax credits), although dividends per share for these countries are displayed net.

For Germany:

- for Datastream users in Germany, the dividend yield includes the tax credit applicable to domestic investors only
- for Datastream users outside Germany, the dividend yield excludes the tax credit applicable to domestic investors only

# Help financial databases

- There is a very useful help feature in the program
- Introduction manuals for Zephyr and Datastream uploaded on [helpdesk.asb.dk](http://helpdesk.asb.dk)








# Event example - Datastream

- Fill out the request table (see example on next slide)
  - Use dates and ISIN codes from Zephyr
  - Remember that it is 200 trading days that you want, so go approximately 365 days back
  - Use Data type=return index (RI)
- When data has been downloaded:
  - Make sure that event dates are in the same row and adjust to 200 days back (or the number of days you want) and 3 days in event window
  - Calculate log returns
  - Name the variables stock1, market1, stock2, market 2 etc



# Event example - Datastream

The Data stream table should look as the following:

Update	Request Type					Format	Series Lookup		Datatype/Expressions/CAF Lookup			Start Date	End Date	Freq	Data Destination
Yes/No	S	TS	TSL	CAF	CH	Select Format								Daily	
y		TS				R	DK0010244508		RI			10-06-04	10-07-05	Daily	Sheet1!R1C1
y		TS				R	DKKFXIN		DSRI			10-06-04	10-07-05	Daily	Sheet1!R1C3
y		TS				R	DK0010274414		RI			16-12-03	14-01-05	Daily	Sheet1!R1C5
y		TS				R	DKKFXIN		DSRI			16-12-03	14-01-05	Daily	Sheet1!R1C7
y		TS				R	DK0060079531		RI			22-06-07	21-07-08	Daily	Sheet1!R1C9
y		TS				R	DKKFXIN		DSRI			22-06-07	21-07-08	Daily	Sheet1!R1C11
y		TS				R	DK0010234467		RI			20-04-06	20-05-07	Daily	Sheet1!R1C13
y		TS				R	DKKFXIN		DSRI			20-04-06	20-05-07	Daily	Sheet1!R1C15
y		TS				R	DK0010234467		RI			13-03-05	12-04-06	Daily	Sheet1!R1C17
y		TS				R	DKKFXIN		DSRI			13-03-05	12-04-06	Daily	Sheet1!R1C19