

An Introduction to Datastream

University of Ulm

Institute of Finance

Content

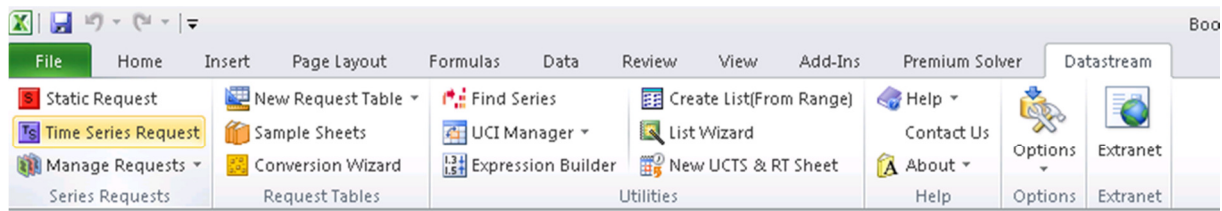
1. How to plug into Datastream
2. Finding what you are looking for
3. Download data for the stocks currently contained in a stock market index
4. Downloading a large number of stocks
5. Hints for working with Datastream

1. How to plug into Datastream

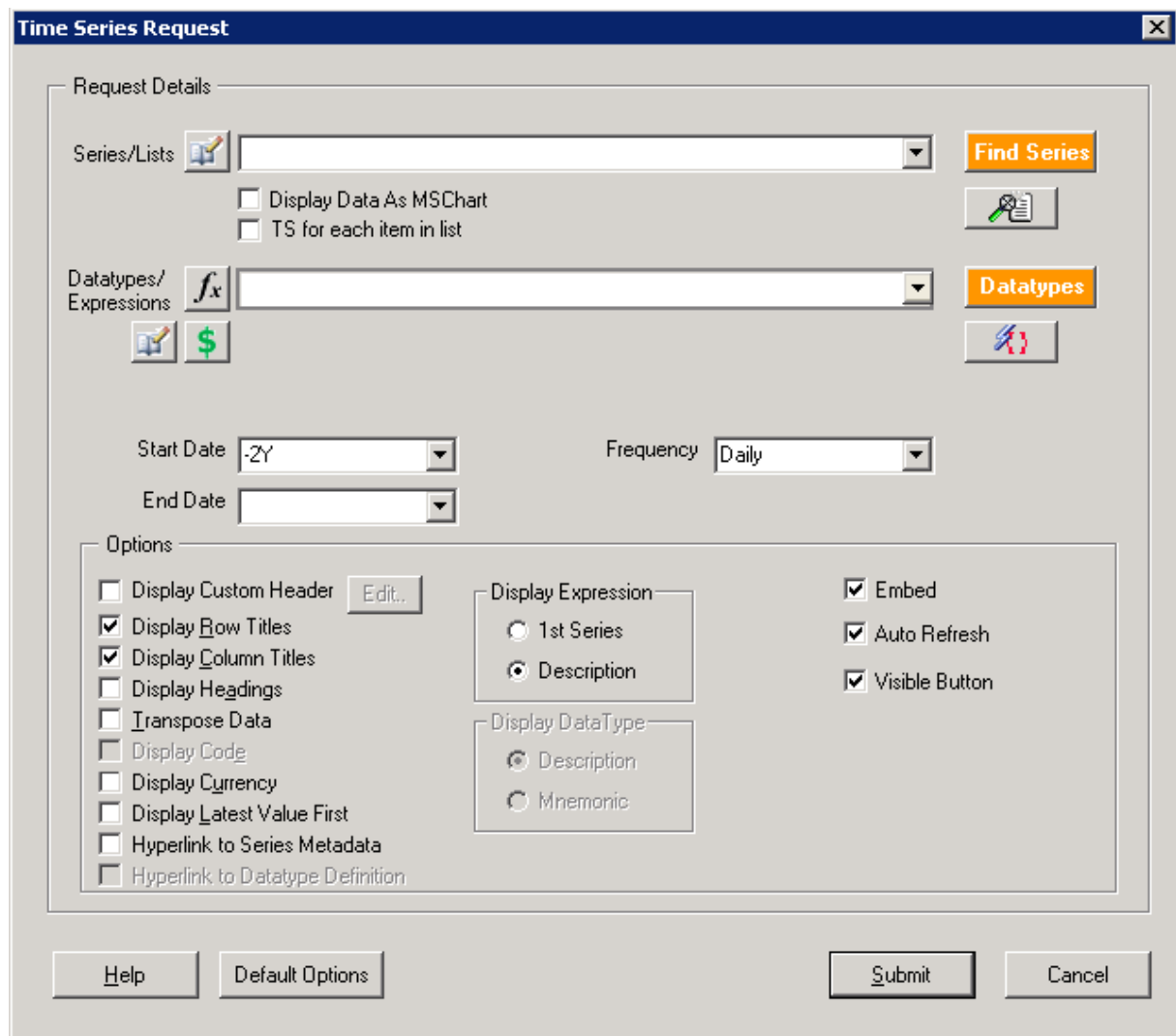
You can use Datastream through Excel via the Datastream add-in. In the following, we give examples on how to work with Datastream in Excel.

2. Finding what you are looking for

Requests conducted by students are typically *Time Series Requests*. From the *Datastream* ribbon in Excel, select *Time Series Request*.



A new window opens.



You need to determine the series (e.g. the DAX, BASF, German unemployment rate) and the type of data (e.g. price, depreciation, net income). For your request, you also need to specify the interval and the frequency. Series can be identified through their specific Datastream code, the mnemonic. However, there are often alternative ways of identifying a series. For example, you can identify most German stocks by putting a “d” before the WKN (security identification number).

2.1. First example

You need the daily stock price of BASF AG over the years 2000 to 2007. In the *Time Series Request* window, click *Find Series*. The *Datastream Navigator* opens: By choosing the appropriate data category (e.g. *Equities*) you can narrow your search down by typing “basf” in the field to the right of the magnifying glass, then press *Search*. Results are shown immediately.

The screenshot shows the 'Datastream Navigator' interface. At the top, it says 'Series Search' and 'Data Category: Equities'. A search bar contains 'basf' and a 'Search' button. Below the search bar is a 'Refine Search' section with filters for Category (Equities), Exchange (London, Frankfurt, National India), and Market (Germany). To the right, a table titled 'Results for basf' lists various series with columns for Name, Symbol, Hist., and Exchange.

All	Name	Symbol	Hist.	Exchange
<input type="checkbox"/>	BASF INDIA	IN:BSF	23Y	National India
<input type="checkbox"/>	BASF	D:BAS	40Y	Frankfurt
<input type="checkbox"/>	BASF (BUD)	HN:BAS	1Y	Budapest Stock Exchar
<input type="checkbox"/>	BASF (MIL)	I:BAF	5Y	Milan
<input type="checkbox"/>	BASF (XET)	D:BASX	21Y	XETRA
<input type="checkbox"/>	BASF (IRS)	BFA	5Y	London
<input type="checkbox"/>	BASF (OTC)	@BFFAF	2Y	Non NASDAQ OTC
<input type="checkbox"/>	BASF (SWX)	S:BAS	22Y	SIX Swiss
<input type="checkbox"/>	BASF SE ADR 1:1	@BASFY	18Y	Non NASDAQ OTC
<input type="checkbox"/>	BASF ADR (FRA)	D:BASA	8Y	Frankfurt

Alternatively, press *Advanced Search* in the upper right corner of the *Datastream Navigator* and search down to the type of information you are looking for. Type “basf” in the *Name* field and press *Search Now*.

The screenshot shows the 'Advanced Search' section of the 'Datastream Navigator'. It features several search criteria fields: Name (Starts With: basf), DS Mnemonic (Contains), DS Code (Contains), Market (Equals), and Base Date (Before). A 'Search Now' button is visible on the right. There is also a notification box for 'Change Navigator 4.3 to all users'.

The result list contains several entries for BASF because BASF shares are traded on several exchanges and Datstream keeps individual records of different data sources. Just “BASF” leads you to the data from the German stock market. Click on the *Name* “BASF” or the *DS Mnemonic* “D:BAS”, and the mnemonic will be pasted into the request window of Excel.

Datastream Navigator
Series Search
Datastream Navigator
 Data Category: Equities
 Results for Advanced Search: Name starts with basf
 Back To Search Criteria

Name	All Results	DS Mnemonic	DS Code	Market	Base Date	Currency
BASF	<input type="checkbox"/>	D:BAS	904881	Germany	Jan 1 1973	Euro
BASF (AMS)	<input type="checkbox"/>	H:BAS	504233	Germany	Nov 18 1996	Euro
BASF (BRU)	<input type="checkbox"/>	B:BASE	540035	Germany	Jun 26 1990	Euro
BASF (BUD)	<input type="checkbox"/>	HN:BAS	77940U	Germany	Nov 15 2011	Hungar

Search for the appropriate type of data using the *Datatypes* button. For example “UP” gives you the unadjusted price, the price that was actually quoted at the respective day in the past. Select a *Start Date* and an *End Date* as well as your *Frequency*.

Time Series Request

Request Details

Series/Lists: D:BAS Find Series

Display Data As MSChart
 TS for each item in list

Datatypes/Expressions: UP Datatypes

Start Date: 31012000 Frequency: Monthly
 End Date: 31122007

Options

- Display Custom Header Edit..
- Display Row Titles
- Display Column Titles
- Display Headings
- Transpose Data
- Display Code
- Display Currency
- Display Latest Value First
- Hyperlink to Series Metadata
- Hyperlink to Datatype Definition

Display Expression: 1st Series Description

Display DataType: Description Mnemonic

Embed
 Auto Refresh
 Visible Button

Help Default Options Submit Cancel

Press *Submit* and the data will be written into the sheet. The upper left corner of the output range is the cell that was selected in the sheet before you opened the request window.

2.2 Second example

You need annual data on total assets of BASF. Search for the appropriate type of data, here WC02999 for “Total Assets”.

The screenshot shows the 'Time Series Request' dialog box with the following details:

- Request Details:**
 - Series/Lists:** D:BAS (with a search icon and a 'Find Series' button)
 - Display Data As MSChart
 - TS for each item in list
- Datatypes/Expressions:** WC02999 (with a search icon, a '\$' icon, and a 'Datatypes' button)
- Start Date:** 31012000
- Frequency:** Yearly
- End Date:** (empty)

Select the time period and frequency, press *Submit* and you obtain the following result:

	A	B	C	D
1	Refresh	BASF SE - TOTAL ASSETS		
2	Code	D:BAS(WC02999)		
3	2000	37750500		
4	2001	36073700		
5	2002	34374800		
6	2003	32783200		
7	2004	32985400		
8	2005	34784800		
9	2006	44943900		
10	2007	46568200		
11	2008	50235000		
12	2009	50593000		
13	2010	58788000		
14	2011	60626000		
15	2012	NA		
16	2013	NA		
17				

The data is missing in 2012 and 2013 because the query was conducted in February 2013 when 2012 and 2013 results had not yet been reported.

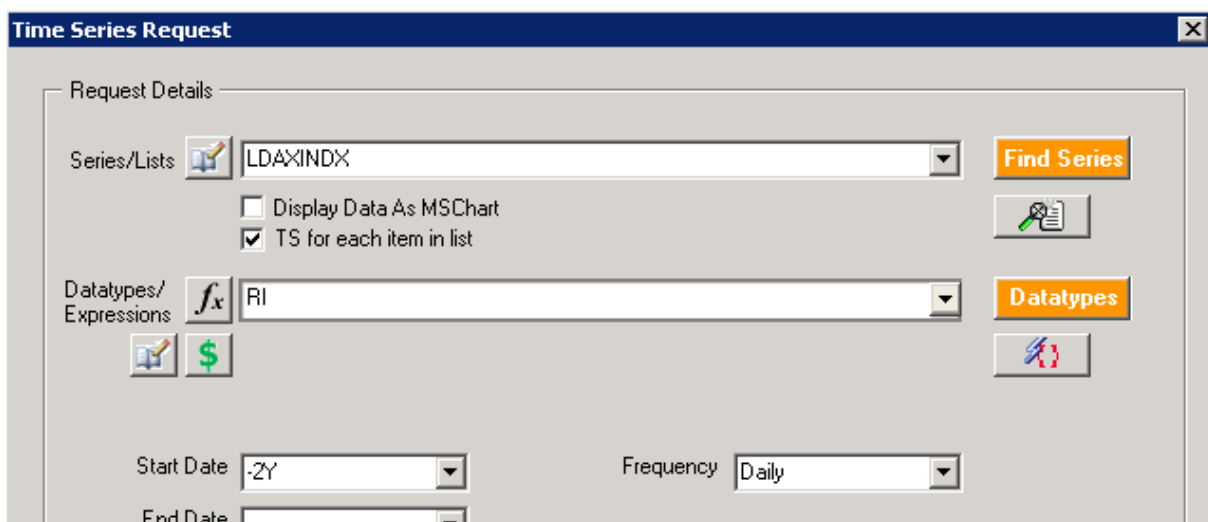
2.3 Third example

You are looking for data on unemployment in Germany. In the *Datastream Navigator*, select the data category *Economics* and use the *Advance Search* button. You may want to type “unemployment” in the *Name* field, and “Germany” in the *Market* field.

Press *Search Now* and you will get a long list of different data in unemployment (e.g. differing in the data provider, or unemployment in various regions). Try to identify what you need. If the list is too long to go through, try to narrow down your search in the search criteria window of the *Advanced Search* in the *Datastream Navigator*.

3. Download data for the stocks currently contained in a stock market index

Select the *Time Series Request* window. Enter the Code for the index in *Series/Lists* field, e.g. “LDAXINDEX” for the DAX 30. Select the *Datatype* that you want, e.g. “RI” for total return index and select dates and frequencies as before. Tick “TS for each item in list”. Press *Submit*.



The result should look similar to this:

	A	B	C	D	E	F	G	H	I	J	K	L
1	Refresh	ADIDAS -	ALLIANZ -	BASF - TO	BMW - TO	BAYER - TO	BEIERSDO	COMMERZ	CONTINEN	DAIMLER -	DEUTSCHE	DEUTS
2	Code	866013(RI)	916641(RI)	904881(RI)	923537(RI)	905243(RI)	929048(RI)	902189(RI)	929030(RI)	688700(RI)	905076(RI)	13454L
3	2/22/2011	563.51	2756.14	7304	9548.84	4130.48	5068.69	239.06	2436.86	113.16	1194.06	407
4	2/23/2011	552.08	2728.58	7232.34	9225.21	4130.48	5103.46	237.78	2357.35	109.93	1192.24	39
5	2/24/2011	545.91	2668.2	7283	9034.84	4132.73	5108.76	237.01	2305.67	107.98	1180.67	394
6	2/25/2011	556.15	2706.27	7317.59	9331.5	4130.48	5108.76	238.75	2371.27	110.51	1211.36	405
7	2/28/2011	557.89	2745.64	7459.67	9375.92	4222.98	5131.15	241.54	2444.41	109.76	1206.81	400
8	3/1/2011	559.8	2708.89	7375.66	9448.9	4186.13	5144.12	242.82	2444.81	109.46	1189.51	396
9	3/2/2011	563.63	2687.89	7442.37	9225.21	4204.93	5086.96	241.19	2438.85	106.52	1191.33	398
10	3/3/2011	571.06	2741.96	7563.45	9260.11	4308.72	5120.55	245.41	2398.7	106.77	1200.18	402
11	3/1/2011	558.96	2737.76	7447.37	9176.85	4238.03	5045.13	243.01	2388.16	103.74	1161.43	400

How do I find out the index list code to make such a download? This is done with the *Datastream Navigator*. In the *Time Series Request* window, press the *Find Series* button. Select the data category *Constituent lists* and then do your search.

First way:

The screenshot shows the Datastream Navigator interface. At the top, the 'Series Search' section is active, with the search term 'dax' entered in the search box. Below the search box, there are navigation tabs: BACK, EXPLORE, RECENT SEARCHES, USE SEARCH REF, SEARCHING HINTS, and SYNCHRONISE USER DATA. A 'Refine Search' sidebar on the left lists filters for Market (Germany: 199, Mixed: 1), Source (Deutsche Boerse: 59, Datastream: 18), and Type (Equities: 158, Future Series: 10). The main 'Results for dax' table lists various DAX-related series with their names and symbols.

All	Name	Symbol
> ★★★★★	DAX Index Constituents	LDAXINDX
> ★★★★★	DAX 30 PERFORMANCE (XETRA) Open	LXETRDAXN
> ★★★★★	EUREX - DAX EX - CONTINUOUS	LFUTGXSC
> ★★★★★	EUREX - DAX EX - DEAD	LFUTGXSD
> ★★★★★	EUREX - DAX EX - LIVE	LFUTGXSL
> ★★★★★	DAX 30 'KURS' Open	LDAXIDXIN
> ★★★★★	DAX Index Constituents Open	LDAXINDXN
> ★★★★★	DAX 100 Auto & Transportation	LDAX1AUT
> ★★★★★	DAX 100 Banks & Fin. Services	LDAX1BNK
> ★★★★★	DAX 100 Construction	LDAX1CON

Second way:

The screenshot shows the 'Advanced Search' window in Datastream Navigator. The search criteria are defined as follows: Name contains 'dax', DS Mnemonic contains (empty), and Market equals (empty). The 'Search Now' button is visible on the right. A notification box at the bottom right indicates a change in the software version to 4.3 for all users.

4. Downloading a large number of stocks

Sometimes you need to compile a data set with all stocks that are listed at a specific stock exchange as well as those that were listed at the exchange at some point in the past. In the example below, it is shown how to download all stocks from the Frankfurt Stock Exchange.

Go directly to the *Advanced Search Window* in the *Datastream Navigator*. Search in the *Equities* category. Choose “Germany” as *Market*. Under *Status* choose *All*, which gives you a complete list, including stocks which no longer exist. Under *Instrument Type* choose *Equity* to limit your search to common stocks. If you also want to include preferred stocks, simply tick *Preference Share* as well. Then type in “Frankfurt” in the field *Exchange*.

Datastream Navigator

Series Search

Datastream Navigator

Data Category: **Equities**

Advanced Search

Name: Starts With [] And Contains [] **Search Now**

DS Mnemonic: Contains []

DS Code: Contains []

Market: Equals Germany []

Base Date (dd/mm/yyyy): Before []

Currency: []

Primary Quote: All Yes No

Major Security: All Yes No

Adjusted Prices: All Yes No

Status: All Active Dead Suspended

Instrument Type: All Equity Genusschein (Profit Participation Certificate) Investment Trust Preference Share Closed-End Fund Exchange-Traded Fund (ETF) Global Depository Receipt Non-Voting Depository Receipt (NVDR) Warrant

Exchange: Frankfurt []

Search Operator
one field.- And &



Then press *Search Now* and you will get a long list with names, codes and other information:

Datastream Navigator

Series Search

THOMSON REUTERS

Data Category: **Equities**

Results for Advanced Search: **Market equals germany**

Displayed Results: 100

Name	DS Mnemonic	DS Code	Market	Base Date	Currency	IBES	NSEI	WS	Primary Quote	Datatypes	Major Security	Ad
118888	DJ218	232238	Germany	Feb 4 2000	Euro	Yes	No	Yes	Yes	E-0200 BM-DI: DL: DL-0200 PH-0100 more	Yes	Yes
1ST REE	DUSB	225075	Germany	Oct 28 1999	Euro	No	No	Yes	Yes	E-1088 BM-DI: DL: DL-1088 PH-0900 more	Yes	Yes
I VALUE CON NH	DVAB	225662	Germany	Aug 8 2000	Euro	No	No	No	Yes	NOSH-AE-CAL: more	Yes	Yes
M. Currency	DVAB	225662	Germany	Aug 8 2000	Euro	No	No	No	Yes	NOSH-AE-CAL: more	Yes	Yes

You have now two possibilities to proceed. You press *All Results* (left red arrow) and Datastream pastes all results to the *Time Series Request* window. Or you proceed with the Excel symbol (right red arrow). The former method is straight forward but you are fixed to the results of this single search. The latter method allows the combination of different search results. Note that only search results with 8,000 lines at a maximum can be exported at once.

Click on the Excel symbol and you can download the data. Close the navigator and request window and open the downloaded file.

	A	B	C	D	E	F	G	
1	Expanded Name	Name	DS Mnemonic	DS Code	Market	Base Date	Currency	
2		118000	118000	D:Z18	283998	Germany	4-Feb-00	Euro
3	First Red	1ST RED	D:SXL	775075	Germany	28-Oct-88	Euro	
4	1VALUE Com NM	1VALUE COM NM	D:VAG	299669	Germany	8-Aug-00	Euro	
5	2G Energy	2G ENERGY	D:2GB	50888T	Germany	30-Jul-07	Euro	
6	3A Real Estate	3A REAL ESTATE	D:3RL	51684R	Germany	26-Feb-08	Euro	
7	3U Holding	3U HOLDING	D:UUU	278415	Germany	24-Nov-99	Euro	
8	4 SC	4 SC	D:VSC	32564F	Germany	15-Dec-05	Euro	
9	4MBO International Electronic	4MBO INTL.ELT.	D:MB4@	263466	Germany	25-Aug-00	Euro	
10	7DAYS Music Entertainment	7DAYS MUSIC ENTM.	D:7DM1	275354	Germany	10-Sep-99	Euro	
11	A I S	A I S	D:LUM	882284	Germany	7-Oct-96	Euro	
12	A Medical	A MEDICAL	D:AMK	75555R	Germany	12-Oct-87	Euro	

Select the column with the DS codes and copy it (the highlighted column in the above example). Now open a new Excel file. From the *Datastream* ribbon choose *New Request Table*.

In the *Series Lookup* column, paste your DS codes or refer to the DS codes when they are stored outside the request table.

Update			Request Type							Format		Series Lookup		
Y	Y/N	N	S	TS	TSL	CAF	CH	SCH	L	Select Format	Find Series			
YES				TS						RCT		283998		
YES				TS						RT		775075		
YES				TS						RT		299669		
YES				TS						RT		50888T		
YES				TS						RT		51684R		
YES				TS						RT		278415		
YES				TS						RT		32564F		
YES				TS						RT		263466		

Now we discuss the filling of the remaining fields. Let us start with the left part. “Yes” in the *Update* column is obvious. “TS” is for the time series request because we want to download a time series for each code. The *Select Format* tells Datastream whether to display series names, dates, etc. and whether the data belonging to one code should be written in one row or one column. Say we would like to arrange the data such that the data for one stock is in one row. Then choose a “T” for transpose because by default a series is displayed in a column. The row title “R” in this case is the name of the series – we would like to display it for each series, which is why there is an “R” everywhere. The column titles “C” are the dates. We need these dates only once because they will be the same for each series if we choose the same start and end date for each series. So we add the “C” only for the first series. Also note that you get a selection of possible choices by clicking on the grey buttons.

Datatype/Expressions/CAF/Search Lookup			Start Date	End Date	Freq	Data Destination
Datatypes					Monthly	
	RI		12/31/2000	12/31/2009	Monthly	D!A1
	RI		12/31/2000	12/31/2009	Monthly	D!A3
	RI		12/31/2000	12/31/2009	Monthly	D!A4
	RI		12/31/2000	12/31/2009	Monthly	D!A5
	RI		12/31/2000	12/31/2009	Monthly	D!A6
	RI		12/31/2000	12/31/2009	Monthly	D!A7
	RI		12/31/2000	12/31/2009	Monthly	D!A8
	RI		12/31/2000	12/31/2009	Monthly	D!A9
	RI		12/31/2000	12/31/2009	Monthly	D!A10
	RI		12/31/2000	12/31/2009	Monthly	D!A11
	RI		12/31/2000	12/31/2009	Monthly	D!A12
	RI		12/31/2000	12/31/2009	Monthly	D!A13
	RI		12/31/2000	12/31/2009	Monthly	D!A14
	RI		12/31/2000	12/31/2009	Monthly	D!A15
	RI		12/31/2000	12/31/2009	Monthly	D!A16

Now to the right part. Choose your type of data, e.g. “RI” for total return index. Choose *Start Date* and *End Date*. Choose *Freq* (Frequency). Now the trickier part: Choose the *Data Destination*. I have inserted a new worksheet in the meantime, which I named “D”.

The data for the first series starts in D!A1; it spreads over two rows because it includes the dates. For the other series, we need just one row, which is why we then have D!A3, D!A4 and so on. Note that it is very easy to fill this down. Assume that you have already filled down the frequency cells. Now select two data destination cells which differ by one row, e.g. the ones with D!A3 and D!A4. Double click on the lower right corner and the cells will be filled down in the way you want it to be.

Then press *Process Table* and the data will be downloaded.

A few tips for working with such data:

- You will see a lot of cases where you do not get any data. This is not surprising with such a download. Some series will not have data in the period chosen by you; some may not have data for the type of data chosen by you, etc.
- If a stock stops trading on an exchange, there are no more prices and you may expect that Datastream has no values for the return series “RI”. This is not the case. Datastream rather keeps the value from the last trading day in its database and displays it as the current one. So you need to find a way of dealing with such cases. In other words: if the values for one series do not change from some time on until the end, you should discard those repeated values. Write a macro to do this job for you. (see also 5. c))

5. Hints for working with Datastream

a) Date conventions

In finance and many other fields, the convention is to work with end-of-period values for monthly and yearly intervals. When working with monthly data, for example, you should therefore use month-end values. This can be accomplished by entering month-end dates into the date fields, as was done in the examples above.

With weekly data, it is more customary to select a date from the middle of the week. When combining different data sources, make sure that they are not based on a different convention.

b) Historical index constituents

If you use the standard constituent lists to download data for an index, you get data for the current constituents. For many empirical analyses, however, you need the historical index constituents as well (e.g. if you want to test how a strategy that selects 10 stocks out of the 30 DAX stocks would have performed in the years 1990-2012).

For some indices and dates, Datastream provides you with historical constituents. Codes are typically codes for the current list plus the historical date. If you do not get the necessary information from Datastream, you need to compile it from other sources.

c) Identifying non-trading days

Datastream usually exports data for exchange holidays even though there is no trade (and thus no price) on such days. For some empirical applications, you need to highlight and purge the data of these days. There are several possible solutions. Here is one example to highlight data on non-trading days:

When you want to get for example total return index data for BASF, type "D:BAS" in the *Series/List* field and "X(RI)*IF#(X(P#S),NNA,ONE)" in the *Datatype/Expression* field of the *Time Series Request* window. You get now the total return index of BASF but the total return index will be negative when there is a non-trading day.

d) Which price/ index type to use

For most purposes such as determining volatilities or investment performance, use the total return index (RI). UP (unadjusted price) is the price as it was historically obtained on the exchange. Use it to implement stock price restrictions (e.g. exclude all stocks with a stock price below one dollar). P (price) is the adjusted price, which takes stock splits and similar corporate actions into account, but does not adjust for dividends. It is Datastream's default datatype but it should not be yours. If you use it instead of the total return index, make sure that you provide good reasons for doing so.

e) Data quality

A discussion of Datastream data quality is given in:

- Ince, O. S./Porter, R. B. (2006): "Individual Equity Return Data From Thomson Datastream: Handle with Care!", *Journal of Financial Research*, 29(4), 463-479
- Brückner, R. (2013): "Important Characteristics, Weaknesses and Errors in German Equity Data from Thomson Reuters Datastream and their Implications for the Size Effect", Working Paper.

This literature suggests a number of screens to deal with quality problems, which you should also consider for your analysis.