The Financial Mathematics and Computation Cluster (FMC) was established in 2009. FMC is funded by Science Foundation Ireland and Industry. Further details about FMC are in the appendix and http://www.fmc-cluster.org/

Note: Databases are located in standalone computers in the Financial Data room.

FactSet Quick Start Guide

## Table of Contents

FactSet Quick Start Guide

What is FactSet?

FactSet is a research platform that consolidates all the analytics and data professionals need to monitor global markets, public and private companies, and equity and fixed income portfolios in a single, intuitive interface.

Getting Started

FactSet's workspace is customizable and flexible. You can save your workspaces online anytime and share with your colleagues. FactSet is also easy to navigate – you can navigate between your tabs with your mouse or via keyboard shortcuts.
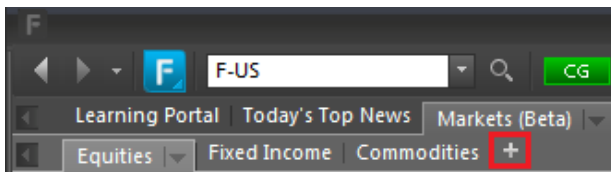
FactSet Insert Menu
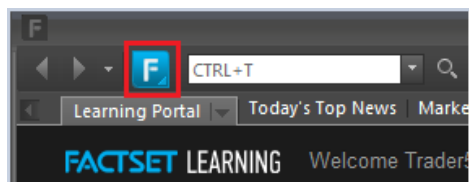
While you are using FactSet, the blue F button is your best friend. From the menu, you can launch and manage your workspace, components, tabs and sub-tabs. Here is a summary of some basic functions of each main category:

- **Learning Portal**
  Access Courses designed to develop your skills and knowledge of Factset.
- **Today's Top News**
  Find market news, company news, investment researches and content online.
- **Markets**
  Access world market data, including indices, gainers & losers, volume, economic reports, etc., and compare market performances and countries data.
- **Quotes**
  Monitor market data (with Market Watch), and access equity, option and futures quotes and historic prices.
- **Charting**
  Chart market data and economic series
- **Economics**
  View calendar of economic data releases, access Economic information by country/region and access economic data comparisons and estimates.

- **Industry**

  View overviews, financials and reports on sectors, industries and regions.
- **Company/Security**

  Access all the available information, estimates and valuations of public and private companies, private equity and venture capital funds
- **Filings**

  Search for corporate filings and transcripts including all regulatory filings
- **Screening**

  Screen for equities and ideas (potential investment opportunities, find potential buyers, track trends, and identify precedent transactions)
- **Portfolio**

  Create, track and evaluate portfolios and/or custom composites in real time.
- **Ownership**

  Research ownership details, recent activity and key ownership statistics about a company, officers and directors affiliated with public and private companies and private equity firms

Inserting Components in Your Workspace

1) Click the plus button next to the tab where you want to create a new tab
2) Then, launch a desired component from the FactSet Insert menu.

If you're using a predefined workspace, you can also click a shortcut icon in the toolbar to launch the corresponding component (please refer to the following screenshot).
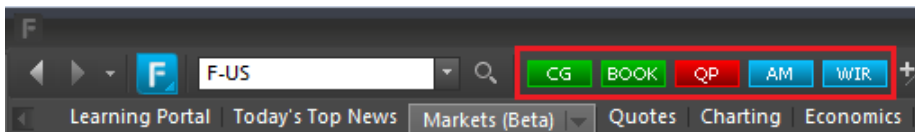
- CG – Company Guide
- BOOK – BookBuilder
- QP – Quick Portfolio
- AM – Alert Manager
- WIR – Wireless Configuration

If you have already searched and selected a ticker using the FactSet search box, you will be able to access the specific information of the ticker as you click these icons. Of course, you don't need to do so. You can always open the tool first and then type in the ticker(s).

Searching with FactSet
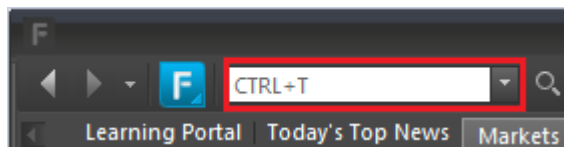
Enter keywords into the FactSet Search box. As you type, the FactSearch drop-down menu will populate with results related to the search keywords. The drop-down menu is separated into the following sections:

- **Entities** - Includes security types such as equities, indices, people, mutual funds, and private companies
- **Components** - Includes all the components found in the FactSet Insert menu
- **Series & Reports** - Includes economic charts and series that are available in Economic Analysis Charting
- **Search Online Assistant** - Opens an Online Assistant search page with a list of help pages that include your keyword

Some Useful Keyboard Shortcuts
- To activate the FactSet Insert menu, press **ALT + F**.
- To display a component outside FactSet, press **ALT + O**.
- To activate FactSearch or the Master Identifier box, press **CTRL + T**.
- To navigate to the lowest tab layer, press **ALT + [1-9]**.
- To toggle up/down through the tab layers, press **CTRL + Up Arrow** or **Down Arrow**.
- To move the cursor left in a tab layer, press **CTRL + Left Arrow** or **Page Up**.
- To move the cursor right in a tab layer, press **CTRL + Right Arrow** or **Page Down**.
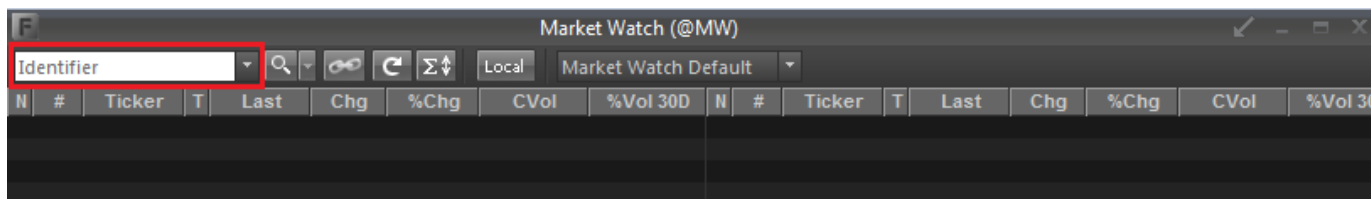
Market Watch

Market Watch is one of the most used components in FactSet. It allows you to create a list of real-time quotes on equities, bonds, commodities, currencies and indices.
To open it, follow: **FactSet insert menu > Quotes / Prices > Market Watch**

For illustration purposes, we will use **IBM**, **BMO bond (1.95% 30-JAN-2017)** and **S&P 500 index** in the following demonstrations.

1) Type and select the in the identifiers in the search box.

As we type, a drop down menu will appear, and we will select the ticker we are looking for. If you don't know the ticker(s), just simply type in the name of the ticker, and you will be able to screen out the results.

2) After you are done, we will be able to monitor the list.

3) If you would like to monitor some other fields, right click on the market watch window > select **Options** > and you can browse through available columns and add new column.

Identifier Lookup

If you are uncertain of the identifier of any securities, click the magnifying glass button and select **Identifier Lookup**, and this will bring out the following window.
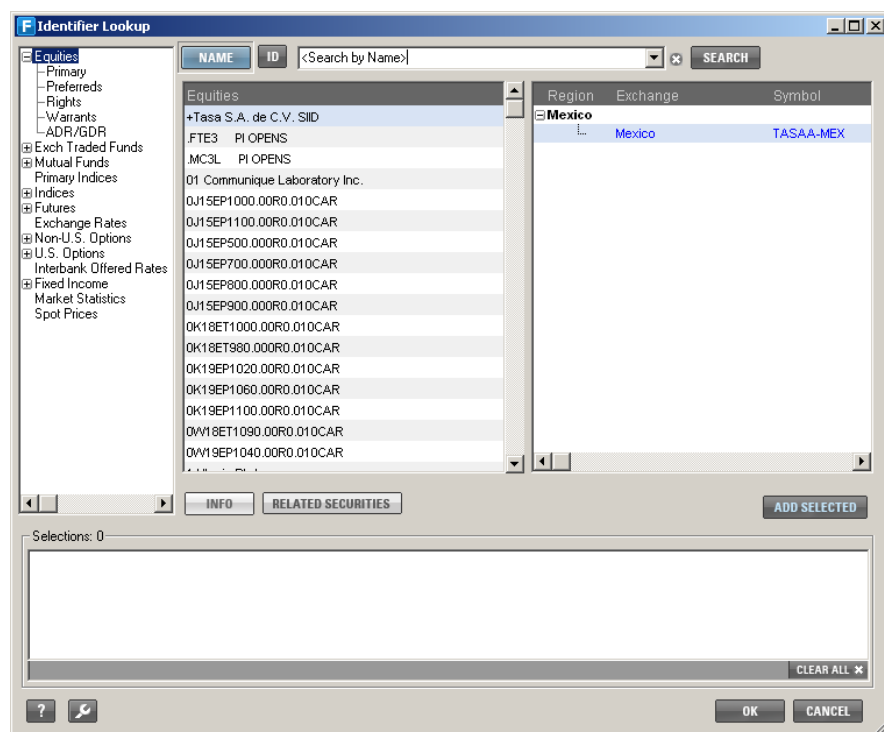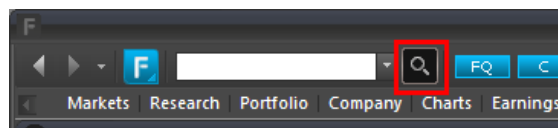
You can search by name and narrow down the results with the categories on the left and the region on the right, and after you finish selecting the name of the security you are looking for, you can narrow down even further by choosing the region and exchange. After that, you can double click the identifier in the right most box or click Add Selected to add the identifier into your selection box. When you are done, click OK and your selections should be added to the tools you have opened (ie. Chart, Market Watch, etc.).

Charting

To chart a security, go to **FactSet Menu > Charting > Chart**. If you already have the identifier in the search box at the top, or you have selected an identifier from the Identifier Lookup, FactSet will automatically chart the symbol for you.

- click to chart multiple indicators.
- click to toggle crosshair.
- click to draw a horizontal line on the chart.
- click to draw a trend line between two points.
- click to draw Fibonacci retracement lines.

To delete any lines drawn, right click the chart and go to **Delete**. If you would like to change the charting details, right click on the chart and go to **Options**.

Charting Specific series

1. in this example we will use the 30 Day US Commercial Paper (USCP30D-TU1)
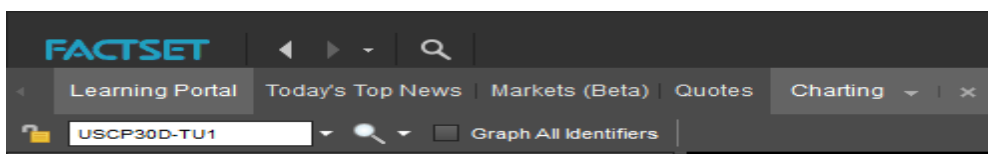
2. Under the "Charts" box on the left hand side click the Blue X (shown below) to remove Plot 2
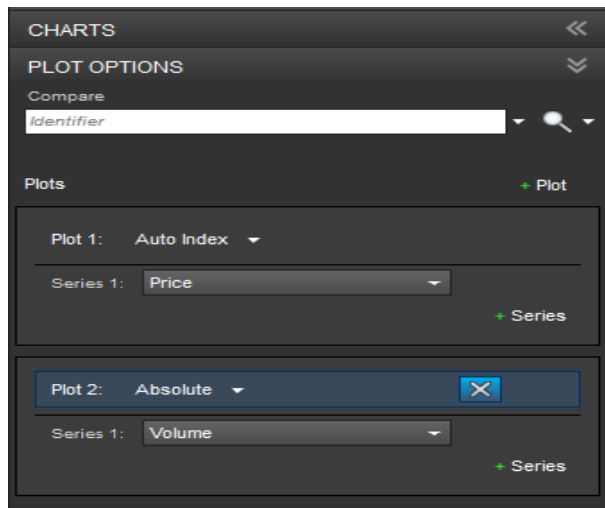
3. Under Plot 1, series 1, click the price button to change the graph
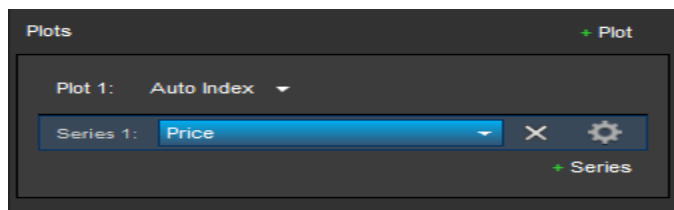
4. Select "Fixed Income" → "Yields" → "YTM" to graph the Yield to Maturity of the 30 Day US Commercial Pape
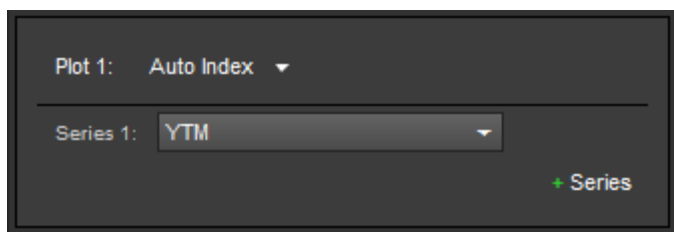
5. To change the date range, click the gear button on the top right side and a pop up "Chart Options" should appear
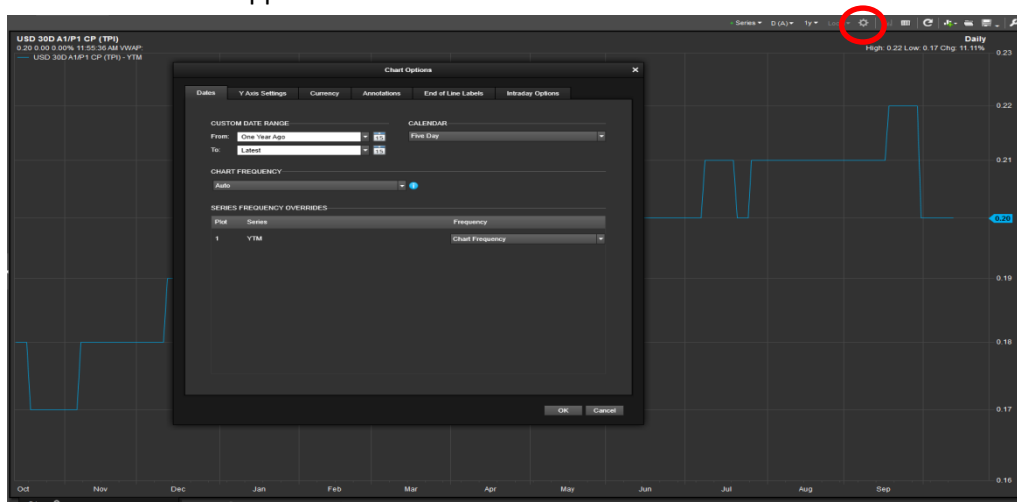
6. Choose the desired date range by clicking the calendar button to the right of the "From" and "To" label. Hit Enter.
7. Click the D(A) button and change it from "Auto" to "Daily"
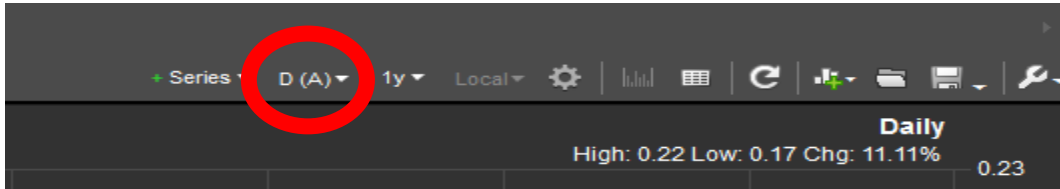
8. Click the "Show Report" Button to show the table of values and find the desired date and the corresponding value.
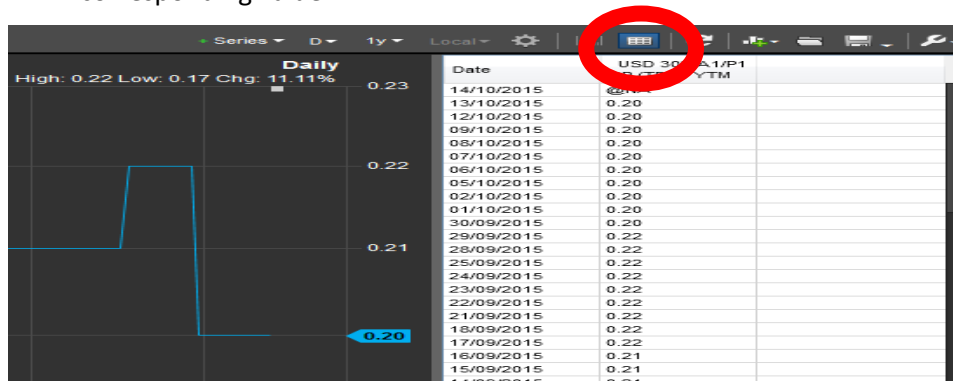
Retrieving Time & Sales data

Retrieving the Data

To calculate a market Volume-Weighted-Average-Price (VWAP) for a certain security using FactSet, click the search icon on the top left of the screen (or press CTRL+SHIFT+F) and type: @T&S
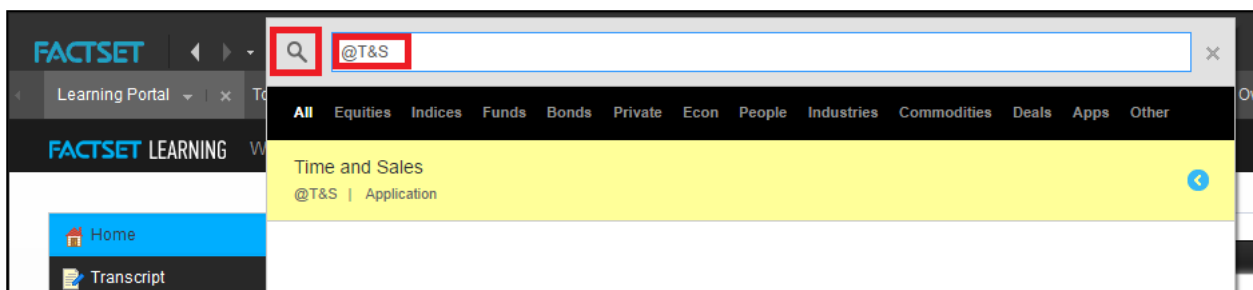
A new "Time and Sales (@T&S)" window will pop up. Within the new window fill out the Date/Time Range and filters side bar to your desired settings. For daily values, remember to set the time from 9:30:00 to 16:00:00 and the beginning and end date to the same date. In this case we will use September 1, 2015 as our date and will uncheck all filters. Next, within the search bar at the top type your security ticker, we will use General Electric (GE-USA) as an example.

After entering your security, press the ENTER key. In our case, the security name will be "GE". If followed correctly, your window will look similar to the one below. If you are unsure about FactSet naming conventions, you can type the name of your security and FactSet should automatically populate a list with the possible results. The ending result will look like the screenshot below.

The next step will be to export the data to Excel to perform your calculations. To do this right click within the table and press "Download Report…" A window will pop up asking where you wish to save the document, you can download the document anywhere but it should be saved as a ".csv" file to ensure proper number formatting. The data can be copied or saved elsewhere after it has been downloaded. Determine what data will be used in your calculations and copy this into a new Excel file. Downloaded data will look like the screenshot below.

	A	B	C	D	E	F	G	H	I	J	K	L
1	GE											
2	General Electric Company								USD			NYSE
3	Last		Chg	%Chg	Bid	Ask	Vol	CVol	ACVol	Turnover	AVWAP	VWAP
4	25.11		0.02	0.08%	25.09	25.14	6178571	43689503		1088316	N/A	24.94
5												
6	From: 01/09/2015 09:30:00 - To: 03/09/2015 04:00:00											
7												
8	Time	Price	Vol	Exch	Bid	BSize	ASize	Ask	CVol	VWAP	Status	
9	16:00:27*	24.57	2867330	NYSE	24.57	1012	1550	24.58	49124615	24.2651	CLT, BK	
10	16:00:00	24.58	1900	NASDAQ	24.57	1012	1550	24.58			CLS	
11	16:00:00	24.58	1900	ARCA	24.57	1041	1550	24.58			CLS	
12	15:59:59	24.58	1900	NASDAQ	24.57	1058	1550	24.58	46247585	24.2457	ISO, x	
13	15:59:59	24.58	117	EDGX	24.57	1048	1384	24.58	46245685	24.2456	ISO, x	
14	15:59:59	24.58	1200	NYSE	24.57	827	1384	24.58	46245568	24.2456	ISO, x	
15	15:59:59	24.5762	200	FINRA ADF	24.57	827	1384	24.58	46244368	24.2456		
16	15:59:59	24.58	200	NASDAQ	24.57	827	1384	24.58	46244168	24.2456	ISO, x	
17	15:59:59	24.58	420	ARCA	24.57	827	1384	24.58	46243968	24.2456	ISO, x	
18	15:59:59	24.58	200	BATS	24.57	827	1384	24.58	46243548	24.2456	ISO, x	
19	15:59:59	24.58	7200	NYSE	24.57	827	1384	24.58	46243348	24.2456	ISO, x	
20	15:59:59	24.58	200	NASDAQ	24.57	827	1384	24.58	46236148	24.2456		
21	15:59:59	24.58	1085	NASDAQ	24.57	827	1384	24.58	46235948	24.2456	ISO, x	
22	15:59:59	24.58	450	FINRA ADF	24.57	827	1384	24.58	46234863	24.2456		
23	15:59:59	24.58	104	NASDAQ	24.57	827	1384	24.58	46234413	24.2456	ISO, x	
24	15:59:59	24.58	511	NASDAQ	24.57	827	1384	24.58	46234309	24.2456	ISO, x	
25	15:59:59	24.58	12	NASDAQ	24.57	827	1384	24.58	46233798		ISO, ODD, x	
26	15:59:59	24.58	9	NASDAQ	24.57	827	1384	24.58	46233786		ISO, ODD, x	
27	15:59:59	24.58	775	NASDAQ	24.57	827	1262	24.58	46233777	24.2456	ISO, x	
28	15:59:59	24.58	12	NASDAQ	24.57	827	1018	24.58	46233002		ISO, ODD, x	

Excel Add-in

1) To launch the Factset add-in search " Factset Excel" in the start menu and select the "FactSet Excel Add-In" shown below. This will have to be done even if Excel is already open.
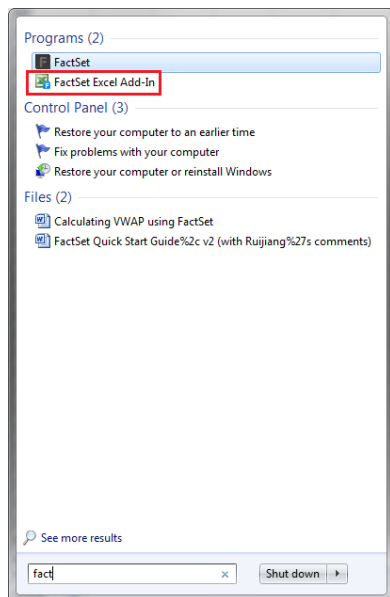
2) If Factset isn't working in Excel please contact the Financial Research & Trading Lab assistants.

3) When FactSet Add-In is enabled and opened properly, you will be able to see FactSet on the toolbar.
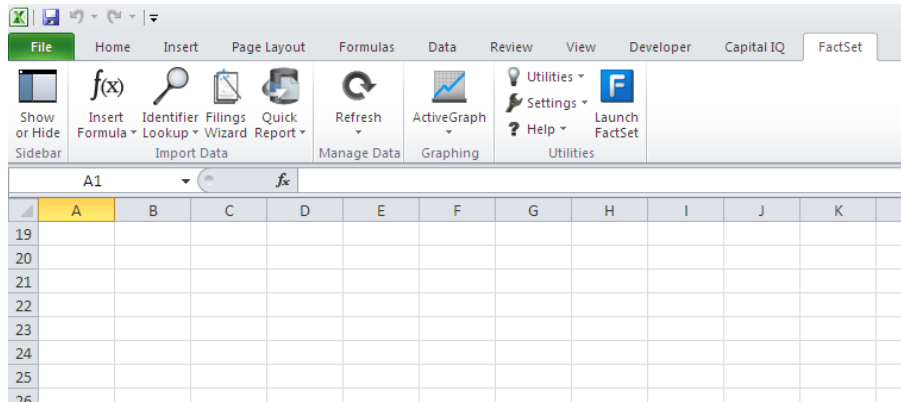
To insert a simple table of a data item versus date, you can click **Sidebar > Insert**, select the identifier(s), the data item and input details, and then hit **Insert** at the bottom.
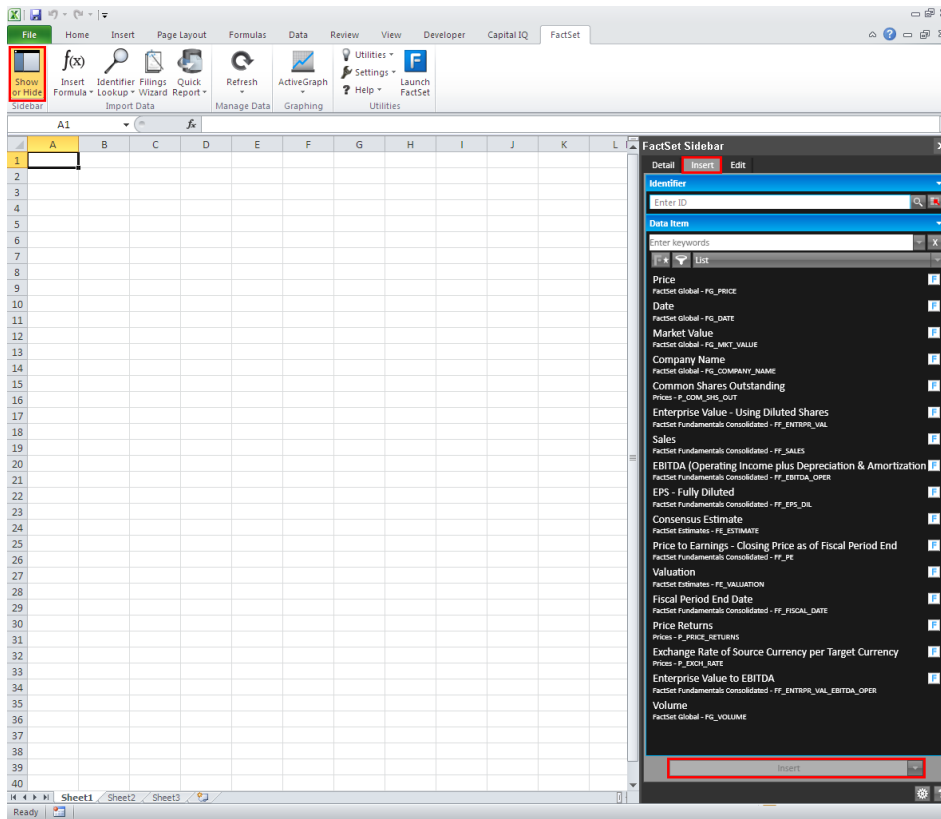
Note: You can only retrieve one type of series at once using this method.

Formula Lookup (FQL)

To look up a formula, go to the Insert Formula Dropdown Menu > Insert Formula, and the FactSet sidebar will pop up.

With Insert Formula, you can search and select the Formula you will use to download and retrieve data from FactSet.
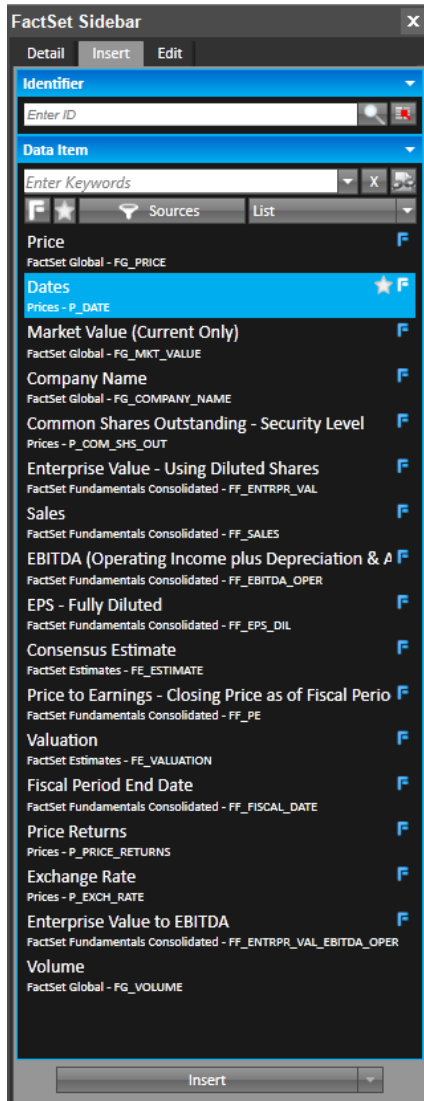
Retrieving Data

There are two ways to retrieve data – **Data Downloading** and **=FDS Codes**.

Using =FDS Codes

=FDS codes are DDE (dynamic data exchange) codes that make a direct call from Excel to FactSet's mainframe. =FDS codes contain both the identifier and the data item. They calculate in the spreadsheet with your codes, so FactSet does not create a separate data file (i.e., you only work with one spreadsheet).

The **Factset Sidebar** will allow you to identify =FDS codes through the formula look-up bar. To download data, first add security identifiers to the sidebar in the "identifier" field as shown below.
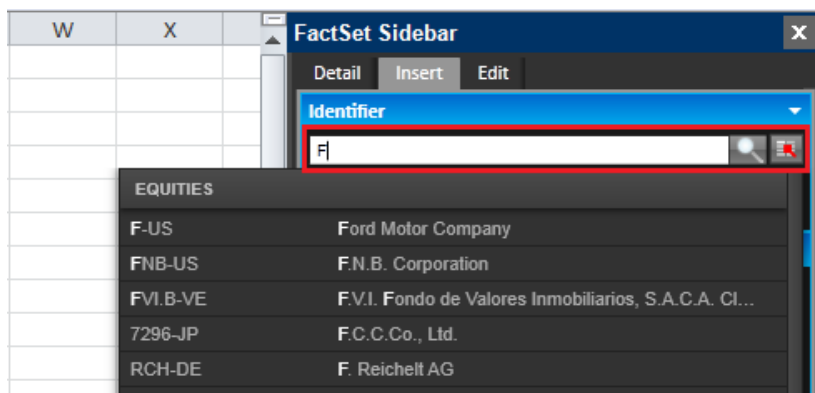
Then include your desired data through the "Data item" field, to request data search for a metric, the example uses EBIT, and press enter. The sidebar will show items that match with your search terms. Select a metric and press insert to input the data to a cell.
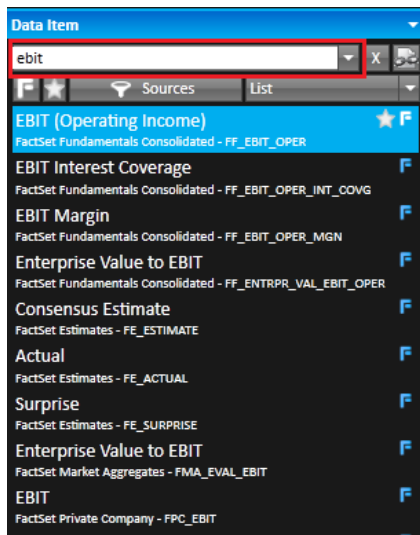
To change the template, you would simply change the FDS formula. As for refreshing your data, you can go to the FactSet Ribbon > Refresh Dropdown Menu > select *All =FDS Codes*

=FDS Code Syntax

The general syntax for using =FDS codes in Excel is as follows:

=FDS("[symbol]","[item(date)]")

Items in square brackets signify inputs of the formula.

An example of retrieving Ford Motor Co price data is: =FDS("F-US","FG_PRICE(0)")

Unlike Data Downloading codes, there is no caret (^) at the beginning of an =FDS code. Instead, the formula begins with =FDS. The symbol and item are enclosed in quotation marks.
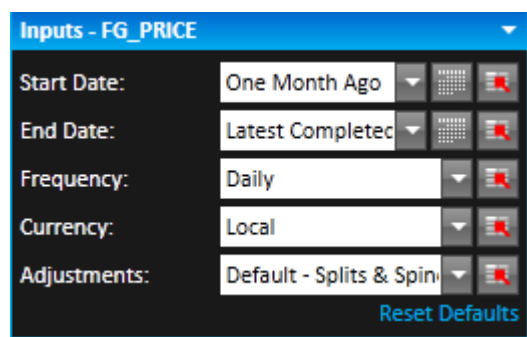
Using FDS Codes for Time Series Data

Use the Factset Sidebar to generate FDS codes for time series data. Much like the earlier function specify the identifier and data item that you wish to pull. After searching for a data item, such as price, select which formula you would like to use. In the example below we selected Price, which then shows three additional tools: Inputs, Definition and Formula Workspace.
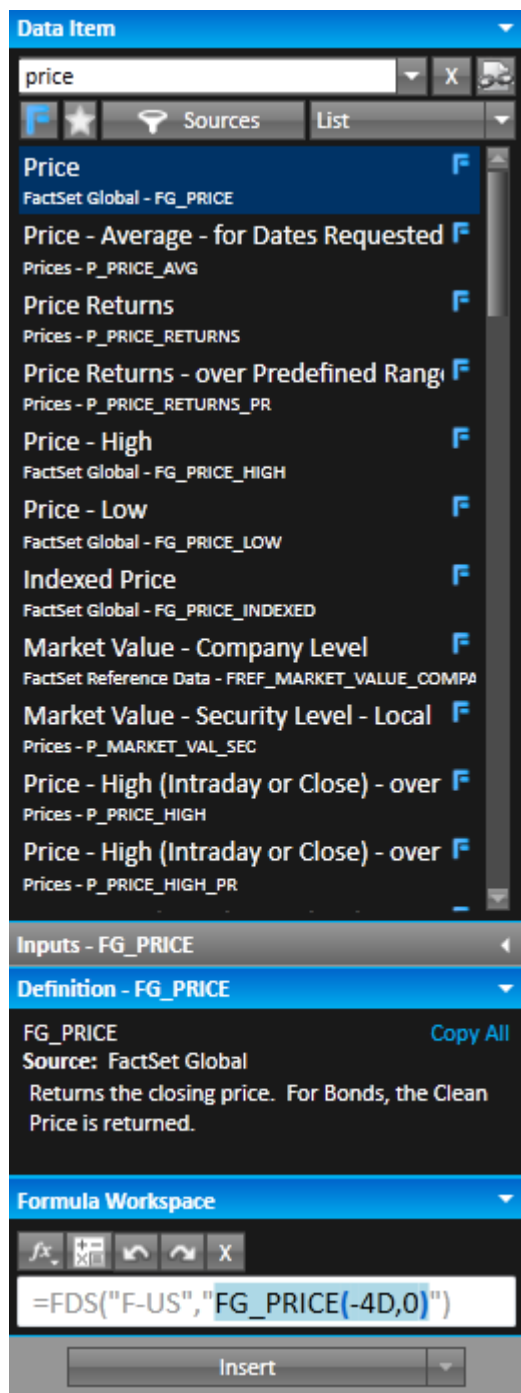
The inputs tab allows you to specify certain characterisitcs for each data item. For Price you can select the Date range you want to look at, the frequency of data, currency displayed and adjustement items. The parameters below show daily price data from one month ago to the last

price in local currency accouting for stock splits and spinoffs. These parameters can be customized to suit the data being pulled.
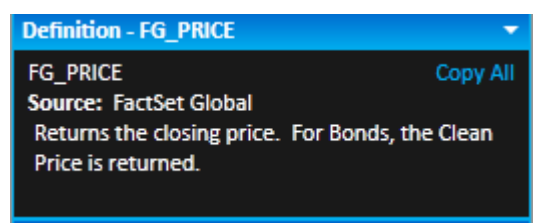
The Defintion tab shows exactly what the formual will be pulling. The picture below shows that this price formula will specifically pull the closing price.
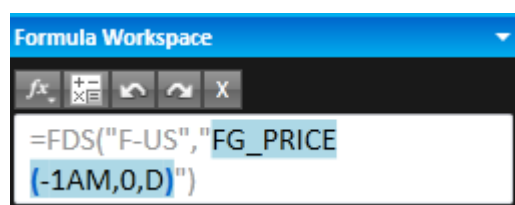
The Formula Workspace tab allows you to view the FDS code that will pull the specific data that you want to pull. You can also edit this code manually to reflect a different request.

When you have finalized all of the parameters you wish to pull regarding time series data click insert to retrieve the values in excel.

Data Downloading

Downloading codes are used in spreadsheets to request data from the databases on FactSet via Data Downloading. To create a template for Data Downloading, select "Series Lookup" from the "Insert Formula" dropdown menu. First select the identifiers you wish to look at through the Indentifiers menu on the right.

This will open a new window where you can search for different assets or data available on Factset. You can use either the search bar or left side menu as shown below.

When you have selected an identifier click "Add Selected" to indicate which identifiers you would like information on, then click ok. This will bring you back to the series lookup screen. In the Series Lookup Screen you will then select which data item you want to retrieve for each identifier.

The red boxes on the screen below show the two ways to search for items: either directly in the search bar or through the suggested items in the left side menu and center display items. The green box shows how to specify characteristics of the data being retrieved such as date. The blue box shows how the data will be displayed on a new sheet. When you have requested everything click ok.

This will load various formulas with a "^" in front of them, as shown below. This is Factset syntax which will then be used to pull the data.

To retrieve the data in the Factset tab, select "Data Downloading" under the refresh dropdown menu as shown below.
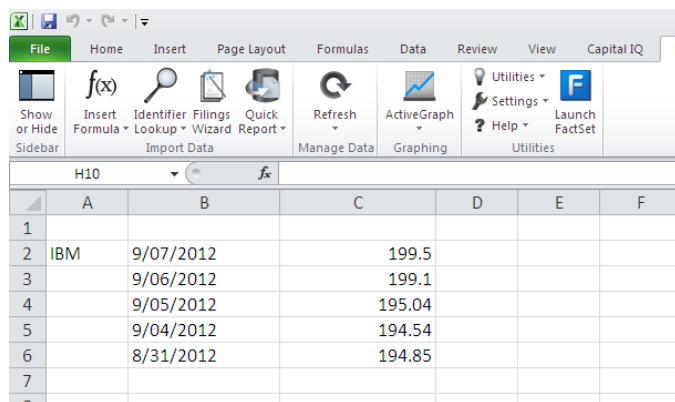
You will then be asked to save a new file which includes the downloaded data. Excel will create a separate file (or **data file**) for each identifier which displays the requested data. If you want to make any changes to the codes in your spreadsheet (formatting, adding new codes, etc.), make sure you make the changes in the original file (or **template file**), and refresh the data from the FactSet dropdown menu and view the results in the new data file.

Template File:

Data File:

References:
1. Factset Fundamentals: https://open.factset.com/products/factset-fundamentals/en-us
2. Factset Ownership: https://open.factset.com/products/factset-ownership/en-us

Industry

FMC² has developed successful research collaborations with international and domestic financial services companies and organisations. These help ensure the industry relevance of FMC²'s research.

FMC² works with multiple external partners including Bank of Ireland, Deloitte Ireland, Citibank Europe, The Institute of Banking, Avolon, AerCap, GECAS, SNECMA, SMBC Aviation Capital and KPMG Ireland.

The formal collaboration between this research cluster and the private sector leads creates a benefit-in-kind situation where company sponsorship creates funding for research projects. In turn the companies benefit from research expertise from FMC² members and access to a pipeline of trained quality researchers.

Who are we?

The academic principal investigators and funded investigators involved are:
John Cotter (Director, UCD)
Don Bredin (UCD)
Gregory Connor (Maynooth University)
Paolo Guasoni (DCU)
Julie Byrne (UCD)
Thomas Conlon (UCD)
Cal Muckley (UCD)
Conall O'Sullivan (UCD)
The cluster supports a research cluster manager and a team of postdoc and PhD researchers based at UCD, DCU and Maynooth University.
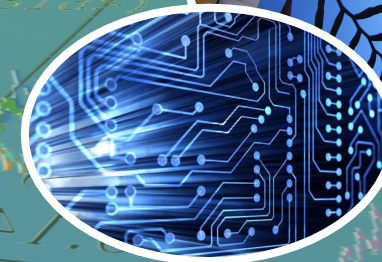
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FMC²
Financial Mathematics and Computation Research Cluster

www.fmc-cluster.org

sfi
Science Foundation Ireland

Financial Mathematics and Computation Cluster (FMC^2)

FMC^2 is a *research collaboration* between Industry, University College Dublin, Dublin City University and Maynooth University. This research group brings together complementary expertise in *financial mathematics, financial economics and computational finance* to create a holistic research programme in asset and risk management.

In addition to providing support for the innovation activities of Irish-based international financial companies, a pivotal outcome of the activities of FMC^2 is the creation of a supply of highly skilled personnel, trained postdoctoral researchers and PhD graduates, with world-class quantitative modelling skills who will support the future growth of financial service exports.

FMC^2 is funded by Science Foundation Ireland's Strategic Partnership programme. The object of this programme is to create partnerships between academia and industry in order to address crucial research questions, and to support the growth of research and development capacity in companies located in Ireland.

The Vision

The objective of FMC^2 is to create a globally recognised research centre that will provide a critical underpinning for the future development of the international financial services sector in Ireland.

www.fmc-cluster.org

VAR
- Factor Modelling
- Dynamic Factor Structure of European Security Market Return
- Risk Measures, Connectivity and Impact on the Real Economy

Valuation
- Pricing Real Assets – Finalization, Policy and Market Implications
- Aircraft Finance and Leasing
- Energy prices and the Impact on Investment Decisions
- Valuation of contracts with embedded inflation linked options

Risk
- Operational Risk – Measurement and Mitigation
- Measuring and mitigating operational risks in financial institutions
- Operational Risk in LIBOR and other Benchmark Markets
- Rogue Trading and Banking