

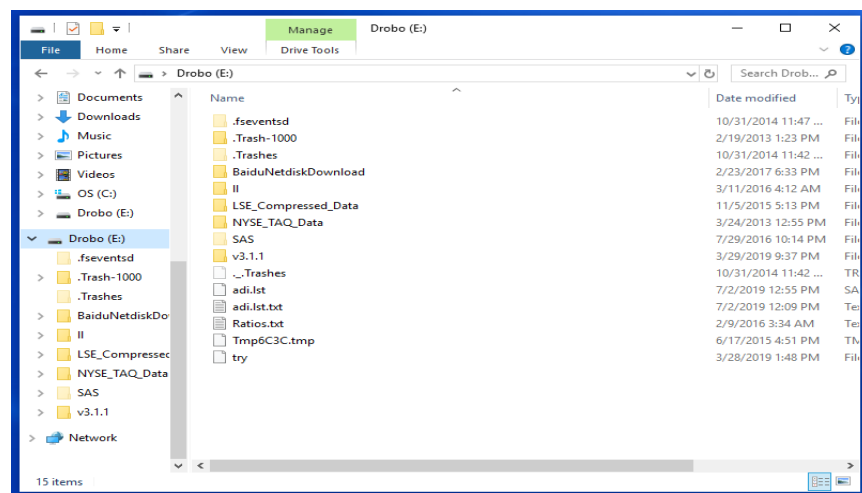
The Financial Mathematics and Computation Cluster (FMC) was established in 2009. FMC is funded by Science Foundation Ireland and Industry. Further details about FMC are in the appendix and <http://www.fmc-cluster.org/>

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

NYSE Trade and Quote (TAQ) Database

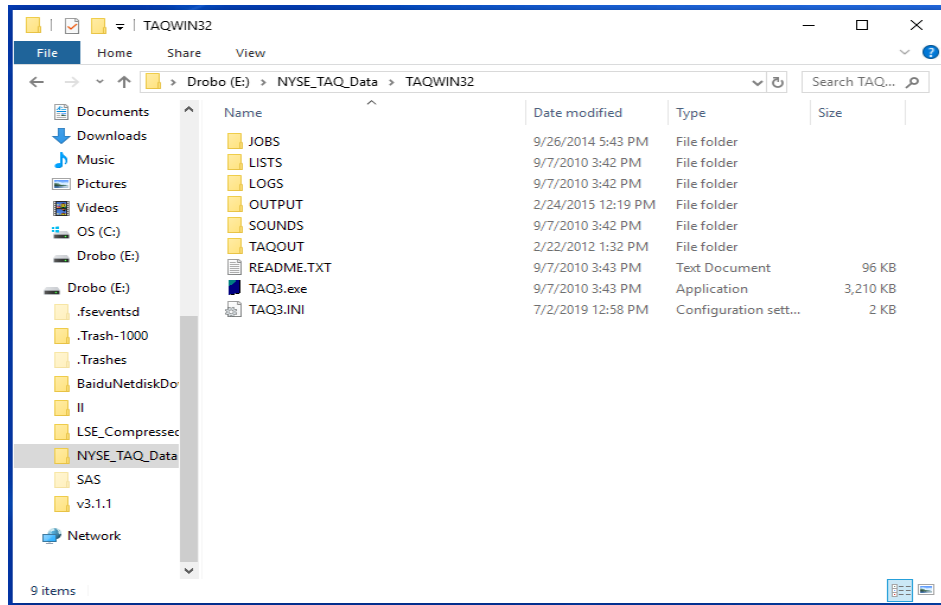
The TAQ database includes data on intraday transactions (trades and quotes) for all the securities listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), Nasdaq National Market System (NMS) and SmallCap issues. The transaction data that is reported outside of the Consolidated Tape hours of operation is not included in this database.

1. Select Drobo (E:) hard drive



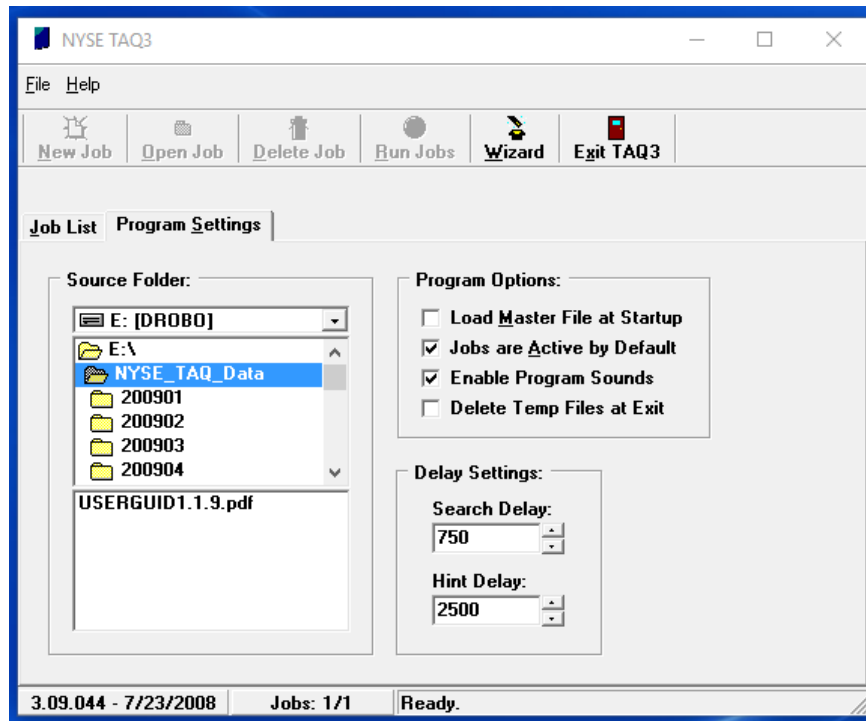
Note: Please connect the hard drive to CPU, if not already connected.

2. Select NYSE_TAQ_Data



3. Select TAQWIN32 and then select TAQ3.exe

Extract the data that you need from the NYSE_TAQ_Data folder.



Note: Please unzip the data files before selecting the data for analysis.

4. You will then be directed to the job entry form where you can describe your analysis.

NYSE TAQ3 - Job Entry Form - [Untitled Job]

File Help

New Job Save Job Default Job Run Job Close Job

Step 1: Select Data Step 2: Select Issue Step 3: Data Formats Step 4: Filter Data Step 5: Output

Job Description:
test run

Process Options:

- ☒ Retrieve Trades
- ☒ Retrieve Quotes
- ☒ Calculate Daily Statistics
- ☒ Include Header Information
 - ☐ First Record Only
- ☐ Include Mast Information
- ☐ Include Div Information
- ☐ Include Corrections

Time Period:

- ☒ Pick Ranges
- ☐ CD Contents
- ☐ Last Year
- ☐ Current Year
- ☐ Latest Month
- ☐ 1st Quarter
- ☐ 2nd Quarter
- ☐ 3rd Quarter
- ☐ 4th Quarter
- ☐ Latest Quarter

Date Range:

Month Of: [v]

Start Date: 1/ 1/2011 [v]

End Date: 6/30/2011 [v]

Time Period:

- ☒ Full Day
- ☐ Selected Time

Time Range:

Start Time: 11:40:23 AM [v]

End Time: 1:02:07 PM [v]

.09.044 - 7/23/200 Symbols: 0 Ready.

5. You can then select the securities either by Ticker Symbol or CUSIP Number.

NYSE TAQ3 - Job Entry Form - [Untitled Job]

File Help

New Job Save Job Default Job Run Job Close Job

Step 1: Select Data Step 2: Select Issue Step 3: Data Formats Step 4: Filter Data Step 5: Output

Input Type:

- ☒ Ticker Symbols
- ☐ Cusip Numbers

Enter Symbol: [v]

Input Source:

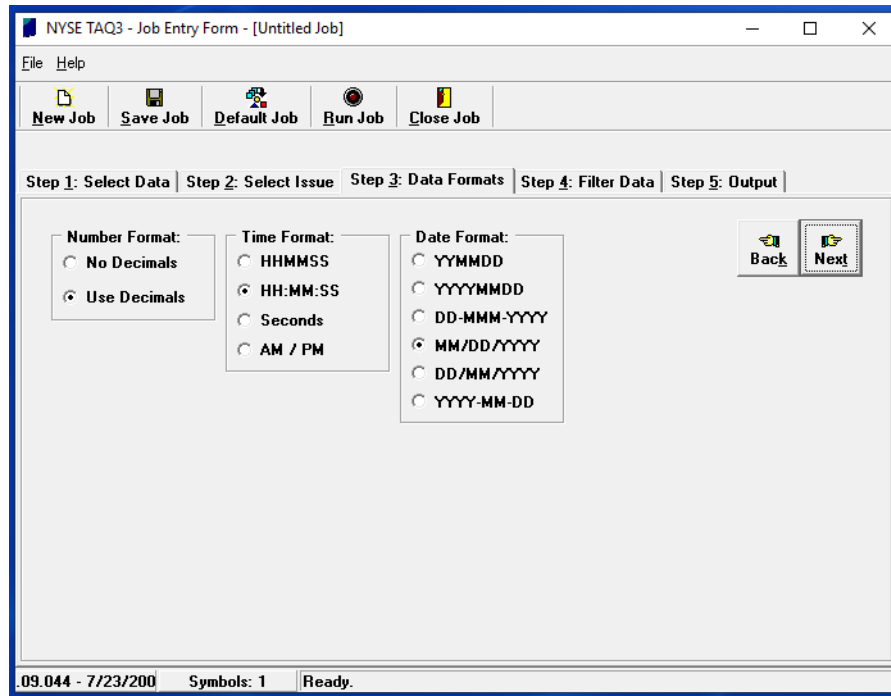
- ☐ Selected Securities
- ☒ Attached File
- ☐ All Securities

Symbols to Process: [v]

Linked Symbol List File: e:\adi.lst [v]

.09.044 - 7/23/200 Symbols: 1 Ready.

6. In the next step you can choose the data format.



NYSE TAQ3 - Job Entry Form - [Untitled Job]

File Help

New Job Save Job Default Job Run Job Close Job

Step 1: Select Data Step 2: Select Issue Step 3: Data Formats Step 4: Filter Data Step 5: Output

Number Format:

- ☐ No Decimals
- ☒ Use Decimals

Time Format:

- ☐ HHMMSS
- ☒ HH:MM:SS
- ☐ Seconds
- ☐ AM / PM

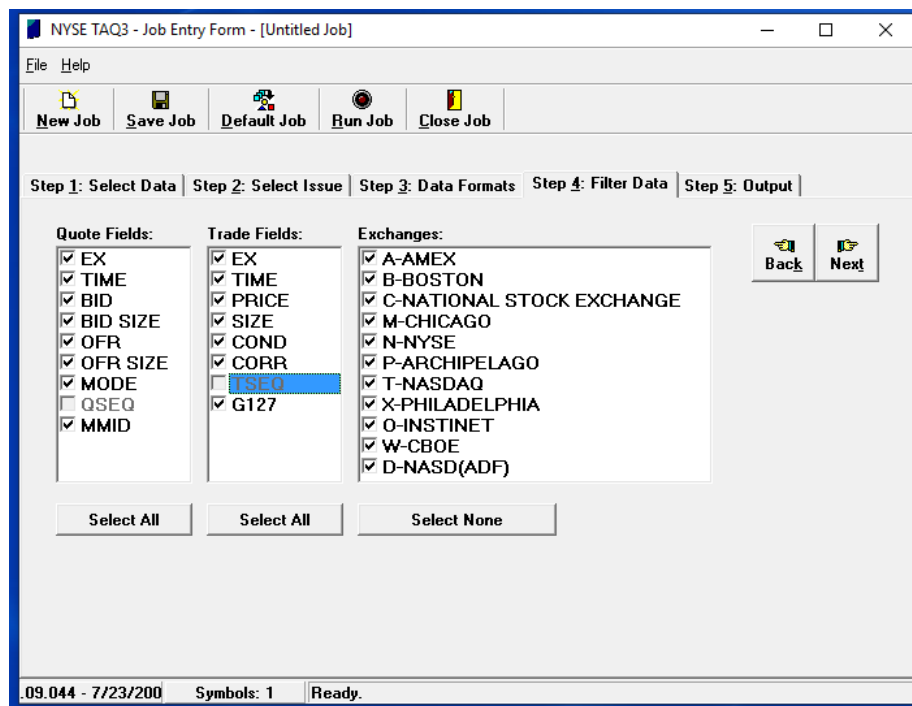
Date Format:

- ☐ YYMMDD
- ☐ YYYYMMDD
- ☐ DD-MMM-YYYY
- ☒ MM/DD/YYYY
- ☐ DD/MM/YYYY
- ☐ YYYY-MM-DD

Back Next

.09.044 - 7/23/200 Symbols: 1 Ready.

7. Now, choose the field that you want to include in the output files.



NYSE TAQ3 - Job Entry Form - [Untitled Job]

File Help

New Job Save Job Default Job Run Job Close Job

Step 1: Select Data Step 2: Select Issue Step 3: Data Formats Step 4: Filter Data Step 5: Output

Quote Fields:

- ☒ EX
- ☒ TIME
- ☒ BID
- ☒ BID SIZE
- ☒ OFR
- ☒ OFR SIZE
- ☒ MODE
- ☐ QSEQ
- ☒ MMID

Trade Fields:

- ☒ EX
- ☒ TIME
- ☒ PRICE
- ☒ SIZE
- ☒ COND
- ☒ CORR
- ☐ TSEQ
- ☒ G127

Exchanges:

- ☒ A-AMEX
- ☒ B-BOSTON
- ☒ C-NATIONAL STOCK EXCHANGE
- ☒ M-CHICAGO
- ☒ N-NYSE
- ☒ P-ARCHIPELAGO
- ☒ T-NASDAQ
- ☒ X-PHILADELPHIA
- ☒ O-INSTITUTE
- ☒ W-CBOE
- ☒ D-NASD(ADF)

Select All Select All Select None

Back Next

.09.044 - 7/23/200 Symbols: 1 Ready.

8. Finally, you can create output files by entering the trade, quote and statistics file name.

NYSE TAQ3 - Job Entry Form - [Untitled Job]

File Help

New Job Save Job Default Job Run Job Close Job

Step 1: Select Data Step 2: Select Issue Step 3: Data Formats Step 4: Filter Data Step 5: Output

Output File Type:
☒ ASCII Fixed
☐ ASCII Delimited

Destination:
☐ To Screen
☒ To File

Output Options:
☒ Overwrite Existing Files

Back Run

Trades Output File Name:
e:\nyse_taq_data\taqwin32\output\trade1.txt

Quotes Output File Name:
e:\nyse_taq_data\taqwin32\output\quotes1.txt

Daily Statistics Output File Name:
e:\nyse_taq_data\taqwin32\output\stats1.txt

.09.044 - 7/23/200 Symbols: 1 Ready.



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.

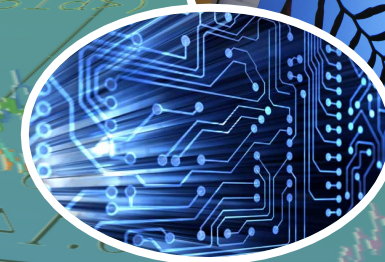
FMC² works with multiple external partners including Bank of Ireland, Deloitte Ireland, Citibank Europe, The Institute of Banking, Avolon, AerCap, GECAS, SNECMA, SMBC Aviation Capital and KPMG Ireland.

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





Financial Mathematics and Computation Cluster (FMC²)

FMC² 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 FMC² 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.

The Vision

The objective of FMC² 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.

FMC² 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.



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