

# XMIM Financial Training Guide



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## CHAPTER 1

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# Introduction

## Objectives

1. Overview of the software.
2. Overview of the database.
3. How to start XMIM.

This manual is intended as an introduction to the XMIM research product. Each lesson contained within this manual is intended to familiarize you with the software and to demonstrate how the software may be used to perform meaningful market-driven research. For more information on the XMIM product, see the [XMIM User Guide](#).

The format of each lesson is broken down into:

- a brief discussion about the market applicability of the specific program's functionality to be learned within the lesson;
- an explanation of the problem to be solved within the lesson, step-by-step instruction on how to use the program to solve the problem;
- an overview of the program's functions used within the lesson; and
- a set of 'problem solvers' which allow you to try out your new XMIM research skills.

## Overview of the Software

Logical Information Machines, Inc. (LIM) has a suite of research software products that allows a researcher to comprehensively analyze and forecast the markets. The software has an automatic link to an extensive database. This two-part package of the software and database will allow you to:

- create historical pricing graphs (example: a 52-week daily price graph of your security with bollinger bands);
- create event-driven analysis (example: seasonality studies); and
- back-test trading strategies (example: a historical profit and loss report generated from entry/exit conditions triggered by a moving average trading system).

## Contents of LIM's Software Suite

LIM's suite of research software includes the following:

- **XMIM**, A menu-driven interface designed to model and evaluate trade opportunities. The software uses a near-English query language to build queries (questions) about historical data.
- **MIMIC**, a software package that provides a point-and-click interface to access data on the MIM server. Use MIMIC to create comprehensive price graphs and charts, including technical analysis overlays and seasonality studies. Build formulas and easily do units of measure and currency conversions.
- **MIM Excel Add-in**, allows for easy data retrieval within an Excel spreadsheet.
- **Application Programming Interfaces (APIs)**, that include Java, .Net, C++, C# and BMIM. These APIs create an open architecture which allows writing of custom applications to serve your special needs, as well accessing LIM data with third-party products.

## Overview of the Database

LIM time series data offerings include energy, equities, futures, fixed income, foreign exchange, economic indicators, weather data, daily price data for all domestic stocks traded at the NYSE, AMEX, and NASDAQ and OTC, daily data for U.S. and international futures contracts, U.S. treasury yield and auction data, daily foreign exchange data, U.S. and international index data, monetary and economic release data.

The MIM server/database resides locally (on-site) and is updated every hour by default. While all of LIM's clients receive the core data set, most of the clients select optional data packages that are relevant to their particular industry. The core data set contains, among other date series, daily pricing data for all energy future contracts, weather data and certain significant date data. For more information on the core and optional data offerings, please see the "Data" section on [www.lim.com](http://www.lim.com).

## Starting XMIM

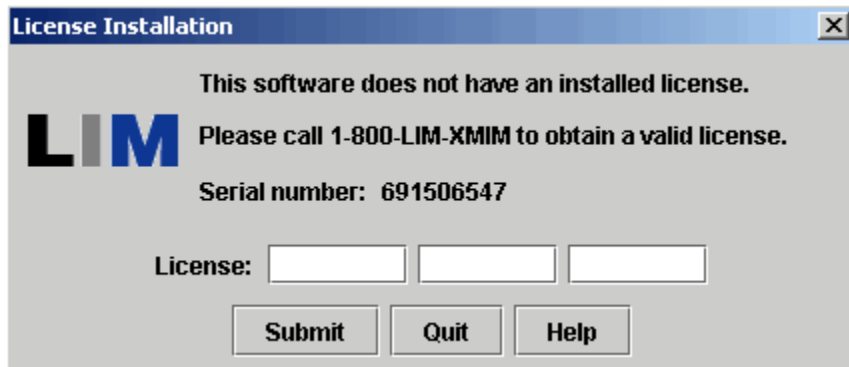
For XMIM installation instructions, see the *Client Application Installation Guide*. The following information displays the first time XMIM is started and only needs to be entered once.

The first time you enter XMIM, an authentication message window displays as in the graphic below:



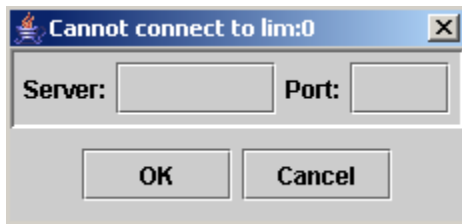
Select **Yes** if you want the authentication window to come up each time you start XMIM, select **Always** to always authenticate the launching of XMIM (recommended choice – you won't see this dialog again unless XMIM is upgraded).

In order to run XMIM you will need to obtain a license key. Make a notation of the serial number listed in the License Installation window (example below). You will need to send this serial number to a LIM Customer Support Representative at [support@lim.com](mailto:support@lim.com) to obtain a license key. (To contact Customer Support by phone dial: U.S. Phone: 1-800-546-9646 ext. 3400, Europe Phone: +44 20 7190 2947 or U.K Free Phone: 0800 032 6063).

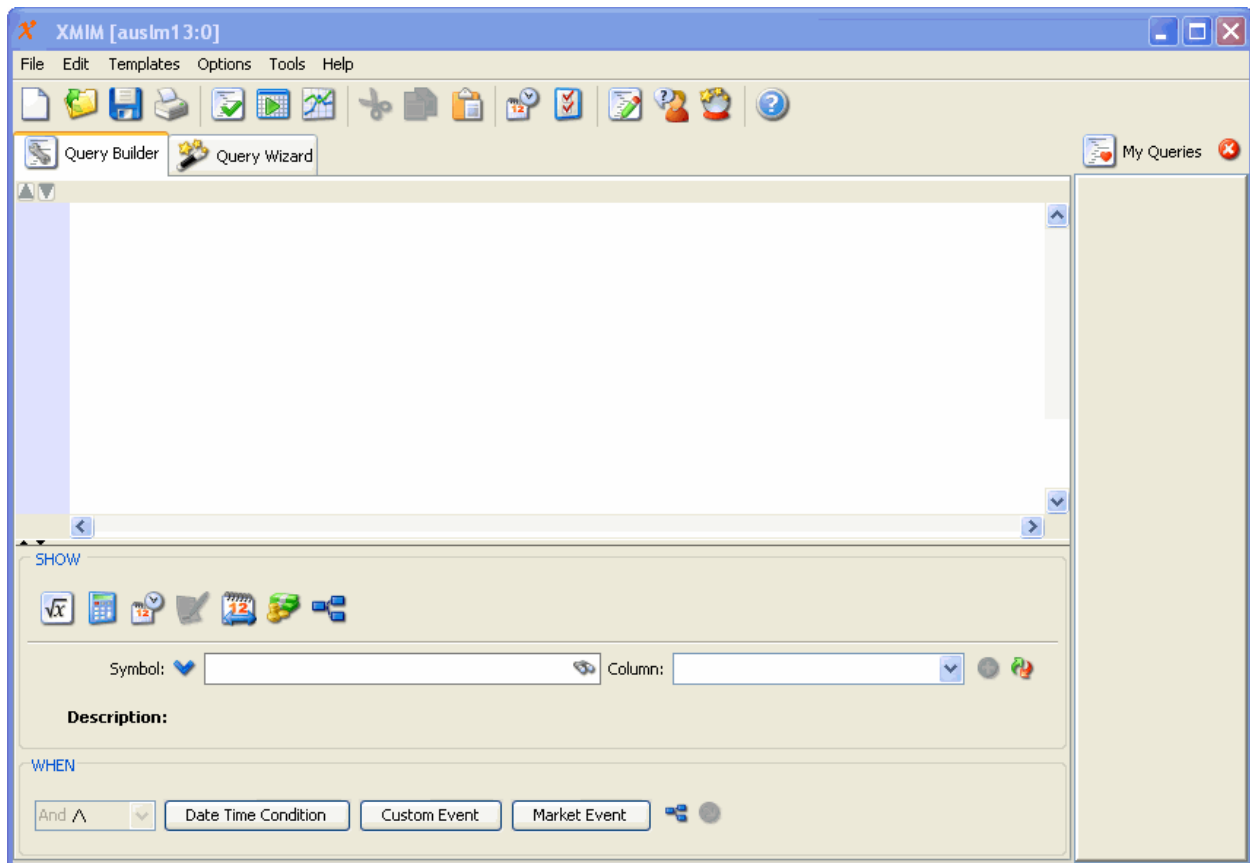


Use **Ctrl+C** and **Ctrl+V** to copy/paste the license key number into the **License** field.

Next, enter the server and port information:



The XMIM interface displays.



The next time XMIM is restarted these screens will be by-passed. To change the server or port settings, select **Options>Connection>Server Config** from the menu bar once the XMIM interface displays.



## CHAPTER 2

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# Getting Started with XMIM

## Objectives


1. How does the software work?
2. Introducing the Query Wizard and the Query Builder.

XMIM is a user friendly software program designed to query a comprehensive historical database that includes, among other data series, security prices, volume, sentiment indicators, weather data and economic indicators. There are two basic types of queries that can be created within the program: the SHOW/WHEN query and the ORDER query.

SHOW/WHEN allows you to ask what happens to the data series when certain conditions hold true. The SHOW/WHEN query is an excellent research aid that allows users to understand, for example, how the price of their securities reacted historically to certain market conditions. The other type of query, ORDER, allows you to test trading ideas by placing buy or sell orders when certain conditions exist. Users often use the analysis prepared in the SHOW/WHEN query to develop trading strategies within their ORDER block queries.

A fast way to produce sophisticated queries for a new user to XMIM is to use the **Query Wizard**. This wizard allows the user to create queries using predefined market and date events. The **Query Builder** contains more advanced functionality and most of this book is dedicated to describing its features.

## Query Wizard Window

Select the  **Query Wizard** button. Use the Query Wizard to create a query using the prebuilt list of market and date events. A user can go back and forth between the Query Builder and the Query Wizard to construct a query.


### Query Wizard SHOW Statement

In the **SHOW** statement portion of the **Query Wizard** window the following query statement is listed:



The Query Wizard allows you to easily identify the type of study you want to apply, what increment of time should be studied and how far past your event dates the study should look. The fields are arranged so that a very understandable phrase like "show what happened in terms of percent move to IBM every day over the next two weeks" can be translated to the MIM query language.

The following describes each of the five fields going from left to right:

- The first field has a choice of: **Total Return**, **Percent Move** or **Move** from the pull-down menu. This field will identify whether a total return, percentage move or move calculation is used to analyze the behavior from the event date to past the event date.
- The second field is where you enter the symbol name of the instrument you wish to study. You can also use the **Search Database**  button to locate the symbol of choice.
- The third field designates what increment of time you want to analyze the movement of the symbol after the event dates. If you want to see what happens each day past the event date, this would be set to **Days**. Alternatively if you wanted to see the movement every week this would be set to **Weeks**. Use the pull-down menu to select **Days**, **Weeks**, **Months**, **Quarters**, **Years**, **Calendar Days**, **Calendar Weeks**, **Calendar Months**, **Calendar Quarters**, **Calendar Years**.
- The fourth and fifth fields designate how far past the event dates you want the study to look. If you want to study the 2 months past the event date set this to **2 months**. The number entry is either typed into the field or selected using the scroll arrows. Select the time period from the pull-down menu. The choices are: **Days**, **Weeks**, **Months**, **Quarters**, **Years**, **Calendar Days**, **Calendar Weeks**, **Calendar Months**, **Calendar Quarters**, **Calendar Years**.

### Query Wizard SHOW Statement Example

Using the Query Wizard, it is possible to form a query that answers the following question:

How have Crude Oil Futures performed in the past after seeing a very big one-day gain, (which is more than two standard deviations stronger than the average one-day percentage change) which occurs three trading days after an OPEC meeting?

The following shows the SHOW pane entries:



The following shows the completed SHOW statement in the **Edit** pane of the **Query Wizard** window:

```
SHOW
t+1: percent_move from today to 1 day later of CL
t+2: percent_move from today to 2 days later of CL
t+3: percent_move from today to 3 days later of CL
t+4: percent_move from today to 4 days later of CL
t+5: percent_move from today to 5 days later of CL
t+6: percent_move from today to 6 days later of CL
t+7: percent_move from today to 7 days later of CL
t+8: percent_move from today to 8 days later of CL
t+9: percent_move from today to 9 days later of CL
t+10: percent_move from today to 10 days later of CL
```

## Query Wizard WHEN Statement

The following shows the date events and the market events that may be applied to your query as conditions.

### Date Event Description

The date events are made up of date files that contain dates for the meetings, report releases or other events that might affect the market. The date events allow users to anchor a variety of important market dates. The date events are located under the **Date Events** pane of the **Query Wizard** window.

For a description of each Date Event, see [the "Date Events" appendix in the XMIM User Guide](#).

### Date Event Example

Below is an example of a date file:

```
20060131
20060228
20060328
20060425
20060530
20060627
20060725
20060829
20060926
20061031
```

An example of the syntax resulting from selecting one of these events is displayed below.

```
WHEN
  Date is in "USA_TCB_Consumer_Confidence"
```

The syntax is saying the condition is true if the date is contained in the date file stored on the MIM server called "USA\_TCB\_Consumer\_Confidence".

## Market Event Description

Market events are pre-canned event conditions that can be easily added as WHEN statements to seek out dates when a particular market event occurred. These market events have been provided to allow users of all levels to write sophisticated queries without knowledge of the MIM query language. The market events are located under the **Market Event** pane of the **Query Wizard** window.

For a description of the Market Events, see the "[Market Events](#)" appendix in the *XMIM User Guide*.

## Market Event Example




For example, there is a market event available called **Large five day decline** located in the **Big Moves** folder in the **Market Event** pane of the **Query Wizard** window. The definition of a **Large five day decline** is an event where the closing price represents a five-day percentage decline of more than one standard deviation below the average five-day percentage change measured over the last 30 trading days. The syntax (see below) to accomplish this WHEN condition is somewhat complex and would typically take advanced XMIM query knowledge to write.

```
WHEN
  5 value percent_move of TU is less than
  (30 day average of 5 value percent_move of TU +
  (1 * 30 day std_dev of 1 value percent_move of TU
  )
  )
```








## Query Builder Window

The **Query Builder** window consists of the **Edit** pane and the **SHOW WHEN** panes. If you are familiar with the query language, you may type a query directly into the **Edit** pane. The **SHOW WHEN** panes allow you to create syntax through menu-driven selections. The following shows the components that make up the **SHOW** and **WHEN** statement portions of the **Query Builder** window.

### Query Builder SHOW Statement

To build a query from scratch, the user must enter a symbol and column and select the **Add Attribute to Query**  button. If you need to clear the **Symbol** and **Column** fields then select the **Restart Attribute**  button and start over. Once the **Add Attribute to Query**  button is selected, the query will display in the **Edit**pane. Use the buttons listed under the **SHOW** statement portion of the **Query Builder** window to modify the query. The following gives a description of the buttons and their functions. For more information see the "**SHOW/WHEN**" chapter in the *XMIM User Guide*.

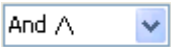
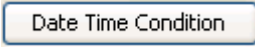

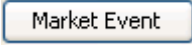


**Table 2-1: SHOW Buttons**

	Studies	A study is a mathematical or statistical calculation of a data series. Some of the studies are macros which may be modified, saved and renamed using the macro editor.
	Arithmetic Operators	Use the arithmetic operators: add, subtract, multiply, divide, power of to accomplish any mathematical formula.
	Attribute Units	Attribute unit sets the default time frequency for any attribute expressions built in XMIM.
	Edit Rollover	Use the choices in the <b>Edit Rollover</b> window to create custom futures contracts.
	Time Offset	The Time Offset menu is used to pick a date, relative to 'today' or the current date executed within the system.
	Profit Loss	Use the choices in the <b>Profit Loss</b> window to show statistics resulting from an ORDER query block.
	IF-THEN-ELSE Statement (SHOW)	This language structure lets you assign values to your Attribute in the SHOW statement based on time, date, event or price conditions.

### Query Builder WHEN Statement

Once the **SHOW** portion of the query is built, use the following buttons to build the **WHEN** portion of the query statement. The following gives a description of the buttons and their functions. For more information see the "**SHOW/WHEN**" chapter in the *XMIM User Guide*.

Table 2-2: WHEN Buttons

	Logical Operators	Multiple WHEN conditions in your query can be linked together into a complex condition using the And, Or, Xor, And Not, Or Not, Xor Not logical operators.
	Date Time Condition	Use the settings in the <b>Date Time Condition</b> window to set either date or time conditions. Use the date choices to set historical date criteria. Use the time choices to set a particular time or range of times during the trading day.
	Custom Event	Use the settings in the <b>Custom Event</b> window to search for conditions, events and patterns in price series. This menu is often used to specify certain market conditions.
	Market Event	The <b>Market Event</b> window contains predefined events created by LIM.
	IF-THEN-ELSE Statement (WHEN)	This language structure lets you assign values to a condition in your WHEN statement based on time, date, event or price conditions.
	Repeat	This time saving feature is selected when you wish to repeat the WHEN condition statement for a continuous period of time.

## CHAPTER 3

---

# Event-Driven Analysis using the Query Wizard Market Events

## Synopsis

### Objectives

1. Using the SHOW statement.
2. Using market events.
3. Using time offsets.
4. Manually editing the syntax.

### Market Brief

Event-driven analysis is often used to predict what might happen in the future based on what has happened in the past. Many analysts will do research to determine when a certain event or set of events occurred and then study how the market reacted in the following hours, days, weeks, months, or further. The SHOW WHEN query is designed to help the user answer the question what happened in the past when this event occurred? Using the Query Wizard, it is possible to quickly and easily build and refine an event driven study.


## Problem

You will take a look at what's happened in the past to the 10-year US Treasury Bond Future when it crossed above its 200-day average and 1 day ago the close experiences a large five day decline. Using the pre-built SHOW statement, the query will calculate the percentage move from each of your event dates to 1, 2, 3, 4, and 5 days past the event date. The **Market Event** pane in the **Query Wizard** window lists a variety of pre-canned conditions, including a "Large five day Decline", that can be added to the query as a WHEN condition. You will select the market event called "Large Five Day Decline" and apply a time offset to specify that this decline occurred in the 5 days prior to your event date. You will also select the market event called "Cross above 200-day Moving Average" as your anchor event. After the query is completed, the following text will appear within the **Edit** pane of the **Query Wizard** window:

```
SHOW
  t+1: percent_move from today to 1 day later of TU
  t+2: percent_move from today to 2 days later of TU
  t+3: percent_move from today to 3 days later of TU
  t+4: percent_move from today to 4 days later of TU
  t+5: percent_move from today to 5 days later of TU
WHEN
  1 day ago
  5 value percent_move of TU is less than
  (30 day average of 5 value percent_move of TU -
  (1 * 30 day std_dev of 1 value percent_move of TU
  )
  )
AND
  TU crosses above 200 day average of TU
```

## Step-by-Step Solution

Now you will step through the process of building this query using the Query Wizard.


1. Select the **Query Wizard** tab and in the **SHOW** pane select **Percent Move** from the first pull-down menu. In the next field (the **Symbol** field) select the **Search Database**  button and select the **Tree View** tab. Open the folders for **Futures>Cbot** then right-click on the symbol **TU** and choose **Select and Close** to add the symbol to the SHOW statement and close the **Search Database** window.
2. Be sure that the field to the right of the symbol field is set to **Days**.
3. Next, in the **SHOW** pane change **Over the next 1 Days** to **Over the next 5 Days** by changing **1** to **5**. This will add new statements to the query (see below).

```
SHOW
t+1: percent_move from today to 1 day later of TU
t+2: percent_move from today to 2 days later of TU
t+3: percent_move from today to 3 days later of TU
t+4: percent_move from today to 4 days later of TU
t+5: percent_move from today to 5 days later of TU
```

4. For the WHEN statement, go to the **Market Event** pane and open the folder for **Big Moves** then select the check box for **Large Five Day Decline**. Select the **Occurred** button and choose **1 Day Ago**. The query statement updates (see below).

```
SHOW
t+1: percent_move from today to 1 day later of TU
t+2: percent_move from today to 2 days later of TU
t+3: percent_move from today to 3 days later of TU
t+4: percent_move from today to 4 days later of TU
t+5: percent_move from today to 5 days later of TU
WHEN
1 day ago
5 value percent_move of TU is less than
(30 day average of 5 value percent_move of TU -
(1 * 30 day std_dev of 1 value percent_move of TU
)
)
```



The **Return**  button will close the **Occurred** selection panel.

5. Next, as our anchor event, go to the **Market Event** pane and open the folder for **Cross-overs** then check the box for **Cross above 200-day Moving Average**. This selection completes the query (see below).

```
SHOW
t+1: percent_move from today to 1 day later of TU
t+2: percent_move from today to 2 days later of TU
t+3: percent_move from today to 3 days later of TU
t+4: percent_move from today to 4 days later of TU
t+5: percent_move from today to 5 days later of TU
WHEN
1 day ago
```

```
5 value percent_move of TU is less than
(30 day average of 5 value percent_move of TU -
(1 * 30 day std_dev of 1 value percent_move of TU
)
)
AND
TU crosses above 200 day average of TU
```

## Language Lesson

In this query, pre-canned event conditions were used from the **Query Wizard**. The definition of a **Large five day decline** is an event where the closing price represents a five-day percentage decline of more than one standard deviation below the average five-day percentage change measured over the last 30 trading days. The syntax to accomplish this WHEN condition is somewhat complex and would typically take advanced XMIM query knowledge to write.

```

WHEN
    5 value percent_move of TU is less than (30 day average of 5 value percent_move TU + ( 1 *
30 day standard_deviation
    of 1 value percent_move of TU))
    
```

This particular market event can be replicated in the **Query Builder** window using the **Custom Event** button which will be introduced in a later chapter. These market events are provided to allow users of all levels to write sophisticated queries easily. See the "[Market Events](#)" appendix in the *XMIM User Guide* for a description of each market event.

## Problem Solvers

Create a query using the Query Wizard that shows what happens to the 30-year US Treasury Bond future contract 1 week and 2 weeks later when the close price is up extra big and the day before it made a new 52-week low.

## CHAPTER 4

---

# Event-Driven Analysis using the Query Wizard Date Events

## Synopsis

### Objectives

1. Using the SHOW statement.
2. Using date events.
3. Setting a date condition in the Query Builder.

### Market Brief

Often important report release dates can have an affect on the market. For instance the Consumer Confidence Index produced monthly by The Conference Board provides information on whether consumers have a positive or negative outlook for the economy for the next six months. The theory is that if consumers believe the economy looks good they will be more likely to spend more money on goods and services, ultimately increasing the economy. It is sometimes meaningful to take a look at what happens to the market when this report is released.

## Problem



This lesson will demonstrate what happened in the past to the S&P 500 GICS Consumer sector index when the Consumer Confidence report was released in the fourth quarter during the heavy holiday shopping season. Using the pre-built SHOW statement, the query will calculate the percentage move from each of our event dates to 1, 2, and 3 weeks past the event date. The **Date Event** window contains a library of date files containing important report release dates, meeting dates, or other dates that may affect the market. You will select the **Consumer Confidence** report from the **Date Events** window. You will also add a condition that will pull only dates in the fourth quarter from the **Date Time Condition** button in the **Query Builder**.

After the query is completed, the following text will appear within the **Edit** pane of the **Query Wizard** window:


```
SHOW
  t+1: percent_move from today to 1 week later  of GICS500.25
  t+2: percent_move from today to 2 weeks later  of GICS500.25
WHEN
  Date is in "USA_TCB_Consumer_Confidence"
AND
  Date is fourth quarter
```

## Step-by-Step Solution

Now you will learn the steps for creating this query.

1. To begin, select the  **Query Wizard** tab. In the **SHOW** pane select **Percent Move** from the first pull-down menu. In the next field (Symbol field) select the **Search Database**  button and then select the **Tree View** tab. Open the folders for **Indices>S&P500GroupsGICS>FinancialsSector** then right-click on the symbol **GICS500.25** and choose **Select and Close** to add the selection to the **SHOW** statement and close the **Search Database** window.
2. In the next field in the **SHOW** pane, change **every Days** to **every Weeks** by selecting **Weeks** from the pull-down menu. This completes the query statement portion from today to 1 week later.
3. The next portion of the **SHOW** pane **Over the next 1 Weeks** determines how many times the query statement is going to display. Change **1** to **2** and note how the query statement changes:

```
SHOW
t+1: percent_move from today to 1 week later of GICS500.25
t+2: percent_move from today to 2 weeks later of GICS500.25
```

4. Next, go to the **Date Event** pane and open the folders for **Economic>United States>Government**. Check the box for **Date is on USA\_TCB\_Consumer\_Confidence**.
5. The final query statement sets a condition that will pull only dates in the fourth quarter from the **Date Time Condition** button in the **Query Builder**. To do this, select the  **Query Builder** tab and in the **WHEN** pane select the **Date Time Condition** button then select the **Date or Time** button and choose **Date is** from the pull-down menu. Select the **within** button and choose **in Quarter>Fourth Quarter** from the pull-down menu. Select the **OK** button to close the **Date Time** window and return to the **Query Builder** window. The following shows the completed query:

```
SHOW
t+1: percent_move from today to 1 week later of GICS500.25
t+2: percent_move from today to 2 weeks later of GICS500.25
WHEN
Date is in "USA_TCB_Consumer_Confidence"
AND
Date is fourth quarter
```

## Language Lesson

This query utilizes the **Date Events** in the **Query Wizard**. The date events are made up of date files that contain dates for the meetings, report releases or other events. Below is an example sample of a date file.

```
...20060131  
20060228  
20060328  
20060425  
20060530  
20060627  
20060725  
20060829  
20060926  
20061031...
```

The syntax resulting from selecting one of these events is displayed below.

```
WHEN  
    Date is in "USA_TCB_Consumer_Confidence"
```

The syntax is saying the condition is true if the date is contained in the date file stored on the MIM server called **\_TCB\_Consumer\_Confidence**. This might explain why the syntax does not more directly state `Date is Consumer confidence release date`.

You also practiced going to the **Query Builder** to add a condition. Any attribute or condition can be added to a query built with the **Query Wizard**.

## Problem Solvers

Create a query using the **Query Wizard** that shows what happens to the NASDAQ index each day over the next 3 days when the FOMC has a meeting.



## CHAPTER 5

# Basic Pricing Graphs

---

## Synopsis

### Objectives

1. Introducing SHOW attributes.
2. Using continuous futures contracts.
3. Executing a query.
4. Restarting or saving a query.

### Market Brief

The most commonly used market research tool is a price graph or chart. Price graphs may be employed to determine where the current price of a security is in relationship to the prices the security made for some relevant period of time by displaying the historical activity for a security. For example, did the security reach a new 1-month high or is the security priced uncommonly low compared to the prices attained over the last year?

The “Money & Investing” section of *The Wall Street Journal* contains price graphs for certain major investment sectors. For example, this newspaper will graphically display the daily closing price for the Dow Jones Industrial Average for the last two calendar years. XMIM allows a user to construct this type of research by building a query. The type of query that graphs price history for an investment is easy to construct. Queries, as mentioned earlier, are English-like questions created about a database consisting of time series data. In the XMIM language the query will SHOW the daily closing price of a security WHEN the date falls within the last two years. Using a SHOW attribute in the Query Builder to build this query, it is necessary to select the symbol (the security of interest) and the column or data series that relates to that symbol (the closing price). This combination of a symbol + a column is a complete description of a times series and the simplest form of what will be referred to as an attribute. Next, the query can be limited to some relevant period of time (e.g., within 2 years) by adding a date condition to the query. These concepts will become clearer as you continue to work through the materials in the manual.

## Problem

You can create a similar graph for our security of interest. A commonly traded over the counter (OTC) security is the 30-year U.S. Treasury Bond. For this lesson, you will create an historical graph of the daily closing yield of the 30-year U.S. Treasury Bond. XMIM data for OTC instruments will commonly have an “Open”, “Close”, “High” and “Low” for the security. Because a proper ‘exchange’ doesn’t exist for OTC instruments, the prices are sampled at certain relevant hours of operation. For example, U.S. Domestic OTC instruments would be sampled during normal U.S. trading hours. The query, when executed as a graph, will display every closing yield for the ‘on the run’ or most recently auctioned 30-year U.S. Treasury Bond. This graph will consist of several different securities over time.


In order to construct this type of query, you will use the SHOW/WHEN query block to define a simple SHOW attribute. This query will SHOW the daily closing yield for the 30-year U.S. Treasury Bond. A query, such as the one used in this lesson, that has a SHOW attribute without a WHEN condition will return all values available for the attribute from the database. The addition of a WHEN condition to a query will simply narrow down the data population.

After you have completed the query, the following text will appear within the **Edit** pane of the **Query Builder** window:

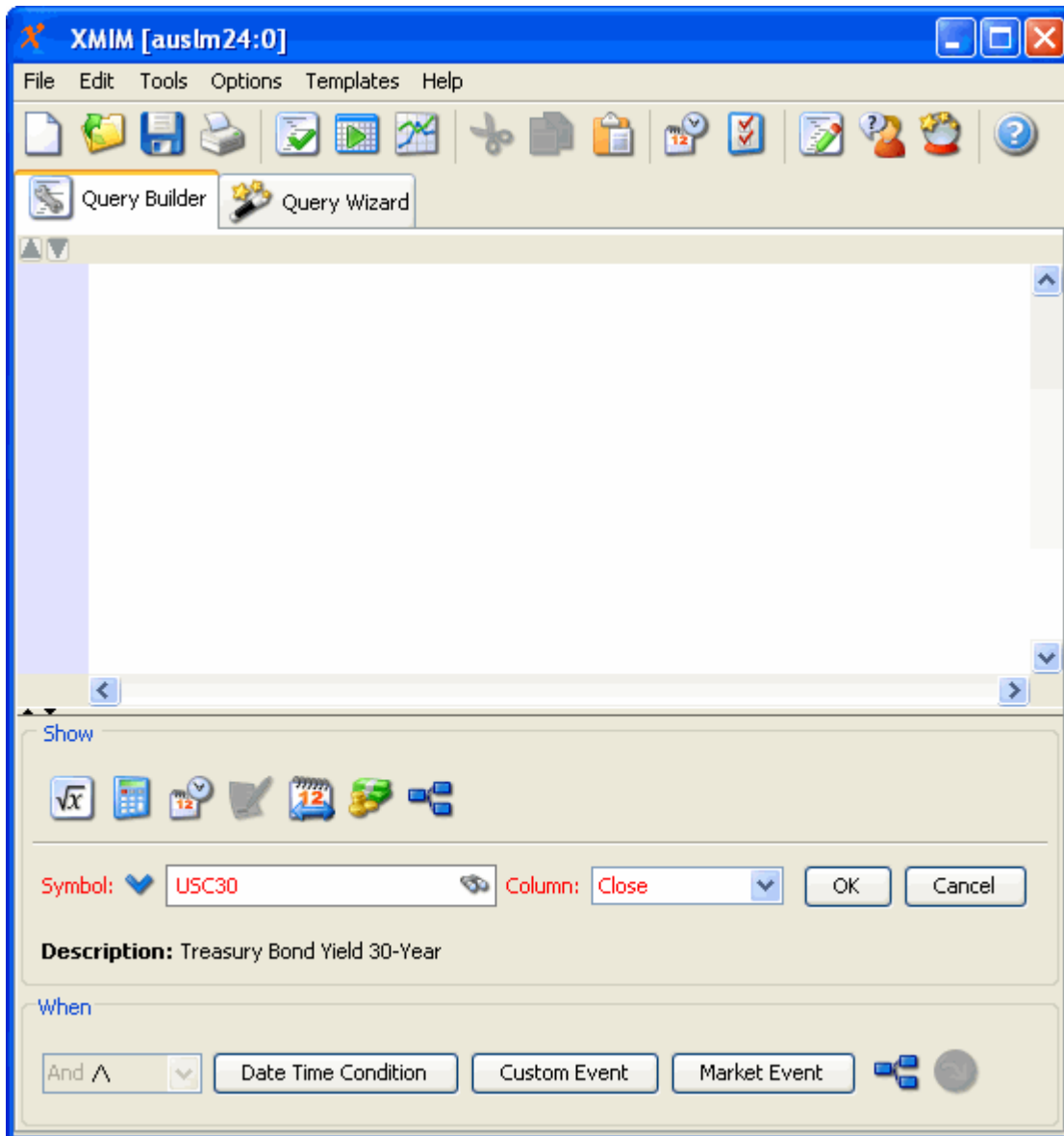
```
SHOW  
1: Close of USC30
```


## Step-by-Step Solution

### Choosing the Symbol and Column of Interest




1. We need to define our *SHOW* attribute by defining our symbol and column of interest.
2. To add a Symbol name you can either enter the symbol of interest by typing it into the text field located next to **Symbol** or by selecting **Search Database** icon to look up the symbol. The **Search Database** is used like a dictionary look-up feature and will allow you to easily find the proper symbol name. For this example, select the **Search Database**  icon to look up the symbol.
3. In the **Search Database** window under the **Tree View** tab, open the folders for **EconomicIndicators > USA\_Economic > US\_GovtYields**. Notice that with each subsequent selection, the directory path displays at the bottom of the window.
4. Select **USC30**, right-click and choose **Select** to complete the symbol selection. The symbol and its default column are entered in the Query Builder. Notice that the description of the contract appears in the description field to verify that the correct selection was made.

Select **OK** to close the **Search Database** window and return to the **Query Builder** window.

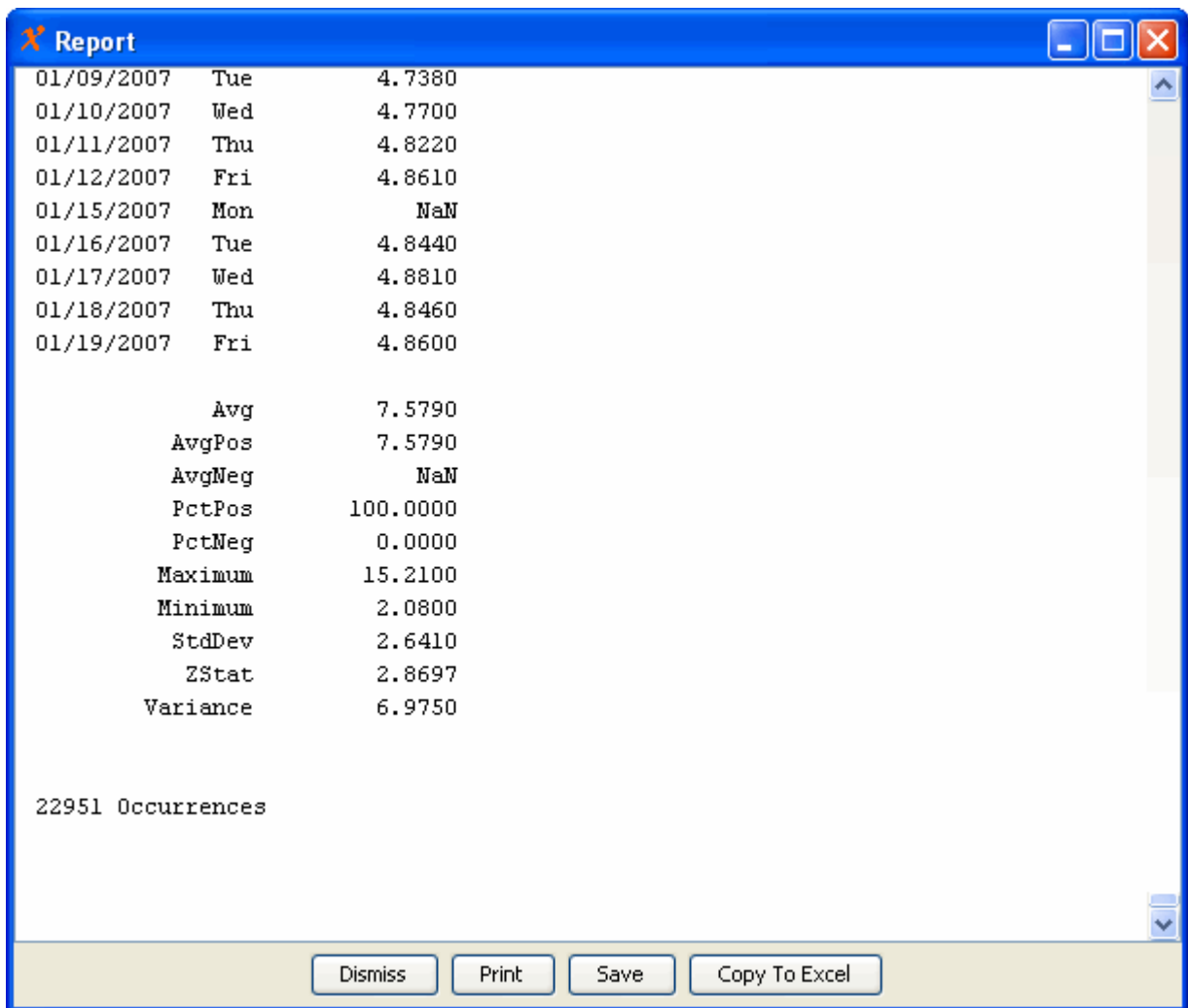


5. The selected symbol should now appear in the **Symbol** text field.
6. The next step involves selecting the data series or column that relates to the symbol. The software will default to the most commonly used column, such as the Close, where no column is specified. To specify a column, select the pull-down for the **Column** field and select a column. For this example, keep the column **Close**. Select the **Add Attribute to Query**  button to add the SHOW statement to the **Edit** pane.

## Executing the Query


- The results of the newly-created query may be obtained by selecting the **Report**  or **Graph**  buttons located in the toolbar. First, select the **Report**  button. Notice that the results are displayed in tabular format. All dates, which have a closing price for the security in the database, will be listed on the left-most column and the closing price for the 30-year U.S. Treasury Bond Yield listed in the column to the right of the date. If a WHEN condition was added to the query, only those dates that met that condition would be returned.

Notice that a few dates reflect NaN in the close column. NaN stands for not a number and will appear anytime a price is not available because the markets are closed (i.e., a holiday) or the designated data vendor did not supply this data. Notice that a few descriptive statistics appear at the bottom of our report to categorize our data population.



Date	Day	Yield
01/09/2007	Tue	4.7380
01/10/2007	Wed	4.7700
01/11/2007	Thu	4.8220
01/12/2007	Fri	4.8610
01/15/2007	Mon	NaN
01/16/2007	Tue	4.8440
01/17/2007	Wed	4.8810
01/18/2007	Thu	4.8460
01/19/2007	Fri	4.8600
Avg		7.5790
AvgPos		7.5790
AvgNeg		NaN
PctPos		100.0000
PctNeg		0.0000
Maximum		15.2100
Minimum		2.0800
StdDev		2.6410
ZStat		2.8697
Variance		6.9750
22951 Occurrences		

Dismiss   Print   Save   Copy To Excel

2. Select **Dismiss** at the bottom of the **Report** window and select the **Graph**  button from the toolbar to see the answers displayed graphically (see below).




Select the **Dismiss** button to close the graph and return to the **Query Builder**.



The **Options** button in the **Graph** window controls the display settings for the graph. These option settings are defined in the "[Analysing Your Research Results](#)" chapter in the *XMIM User Guide*.

## Restarting or Clearing the Edit Pane

To clear the **Edit** pane for the next query, select the **New**  button from the toolbar. You will be prompted about saving the query. For this lesson, select **No** to clear the **Edit**pane.

## Language Lesson

The SHOW/WHEN query allows a user to question what happens to the market when certain conditions are present. A query may be constructed by either making certain menu selections in the **Query Builder** window or by typing the query directly into the **Edit** pane.

The format for the SHOW/WHEN query is:

```
SHOW
  1: (Column) of (Symbol)
WHEN
  Defined conditions are true
```

An attribute is a complete description of a time series. An attribute is any expression that, when interpreted, represents a series of values arranged chronologically into an array or matrix. An attribute is represented in XMIM by a unique identifier call a symbol. For example, `CPQ` represents COMPAQ stock and `US` represents the U.S. 30-year Treasury Bond Futures contract. Symbols are organized in the database in hierarchical or tree fashion by certain major market categories.

## Problem Solvers

1. Construct a query that will graph the closing yield for the U.S. 10-year Treasury Bond.
2. Construct a query that will graph the opening price for the U.S. 30-year Treasury Bond futures contract.

## CHAPTER 6

# Limiting the Graph to a Relevant Period of Time

## Synopsis

### Objectives

1. Limiting the attributes using the WHEN date condition.
2. Multiple SHOW attributes.
3. Using compound attributes.
4. Introduction to the arithmetic operator.

### Market Brief

Investors examine price history for some significant period of time, such as a 52-week chart or a 6-month chart. Price history is commonly viewed in bar charts, although many chart traders may prefer to use only closing prices for their price graphs. A graph that uses a daily bar represents the opening price with a left horizontal mark, the close by a right horizontal mark and the two daily extremes of the high and low and as the top and bottom of a vertical line. The difference between the extreme points on the bar is the daily price range for the security. Some investors prefer to view the range as a value separate from the bar chart. Certain traders maintain that when a security trades within a tight range for a period of time (where the daily range is much smaller than usual for some period of time), a price breakout to the up or downside is expected.

To confine the period of time that the attribute will be shown, it is necessary to construct a WHEN condition. The WHEN condition provides the ability to confine the results of the query or “question about the markets” to specific dates and times of interest. It was mentioned earlier that XMIM’s language structure for the SHOW/WHEN query, is SHOW my security WHEN certain conditions are met. What is it that you would like to see WHEN those conditions are met? You would like to see both a bar chart (the open, close, high and low prices for our security) and the daily range for your security.




## Problem

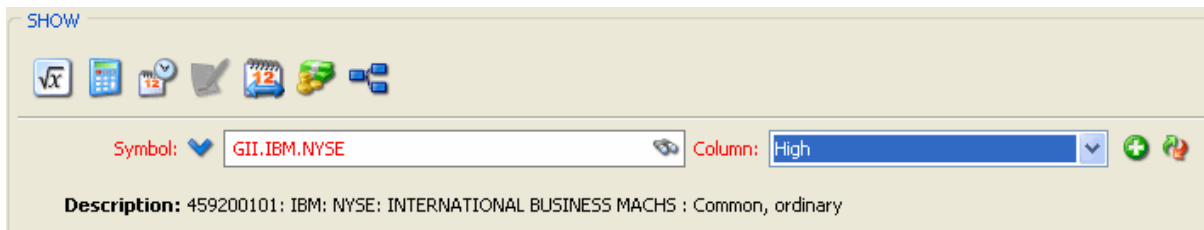
For this lesson, you will create an historical bar chart for GII.IBM.NYSE stock and the daily range associated with the stock for each day within the last year of trading. You will capture the daily price bar (open, high, low and close) and the range (the high of the day minus the low) for each day. In order to construct this type of query it will be necessary to use the SHOW/WHEN query block. Using the SHOW/WHEN query, you will need to define a SHOW attribute and a compound SHOW attribute (constructed as <SHOW Attribute> <Arithmetic Operator> <SHOW Attribute>).



After the query is completed, the following text will appear within the **Edit** pane of the **Query Builder** window:

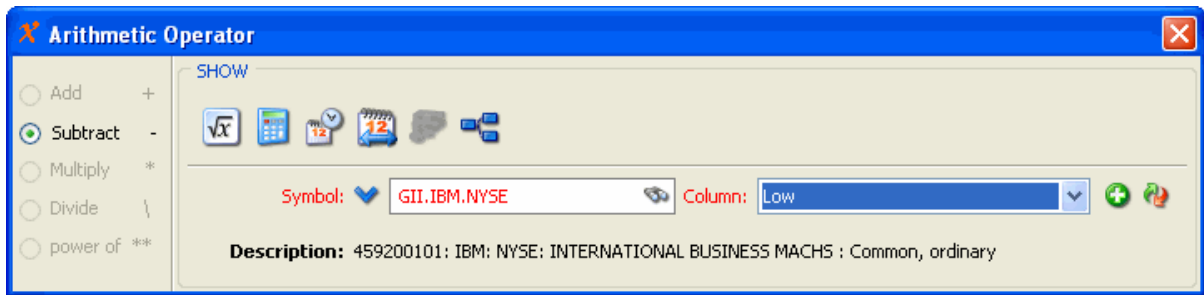
```
SHOW
  1: Bar of GII.IBM.NYSE
  2: High of GII.IBM.NYSE - Low of GII.IBM.NYSE
WHEN
  Date is within 1 year
```

## Step-by-Step Solution

1. You need to create two separate SHOW attributes for this query. Begin by creating the first attribute, Bar of GII.IBM.NYSE. Select the **Search Database**  button then select the **Tree View** tab. Locate the symbol GII.IBM.NYSE by opening the folders for **Equities > GlobalInsight > Nyse > Tickers > i > ib**. Right-click on the **GII.IBM.NYSE** symbol and choose **Select** to add the symbol. Select **OK** to close the **Search Database** window and return to the **Query Builder** window.
2. Upon completion of the symbol, the **Symbol** text field should have **GII.IBM.NYSE** highlighted and a description of the contract. Instead of using **Close**, you will select **Bar** from the **Column** pull-down menu.
3. Select the **Add Attribute to Query**  button to add the attribute to the **Edit** pane. The **Edit** pane will contain the first SHOW attribute portion of the query.
4. The next SHOW attribute is actually a compound attribute: High of GII.IBM.NYSE - Low of GII.IBM.NYSE. This attribute will require selection of two attributes and the use of an arithmetic operator. Select **GII.IBM.NYSE** as the symbol using the **Search Database**  button or type GII.IBM.NYSE into the **Symbol** field. Select **High** from the **Column** pull-down menu.



5. If you were to accept the information currently selected in the **SHOW** pane, you simply see the high price for the IBM contract. You want to see the difference, however, between the high and the low. In order to accomplish this task you will need to use an arithmetic operator to link the two attributes together (High of GII.IBM.NYSE - Low of GII.IBM.NYSE). To do this, select the **Arithmetic Operator**  button and select the **Radial** button for **Subtract**.
6. The **Arithmetic Operator** pane in the window becomes ghosted (inactive) and the **SHOW** pane in the window becomes active. In this **SHOW** pane you will enter the Low of GII.IBM.NYSE portion of your compound attribute. Type GII.IBM.NYSE into the **Symbol** field and choose **Low** as the **Column** to complete the attribute. Select the **Add Attribute to Query**  button to add the compound sentence High of GII.IBM.NYSE - Low of GII.IBM.NYSE to the **Edit** pane and return to the **Query Builder** window.



The following shows the query so far.

```
SHOW
1: Bar of GII.IBM.NYSE
2: High of GII.IBM.NYSE - Low of GII.IBM.NYSE
```

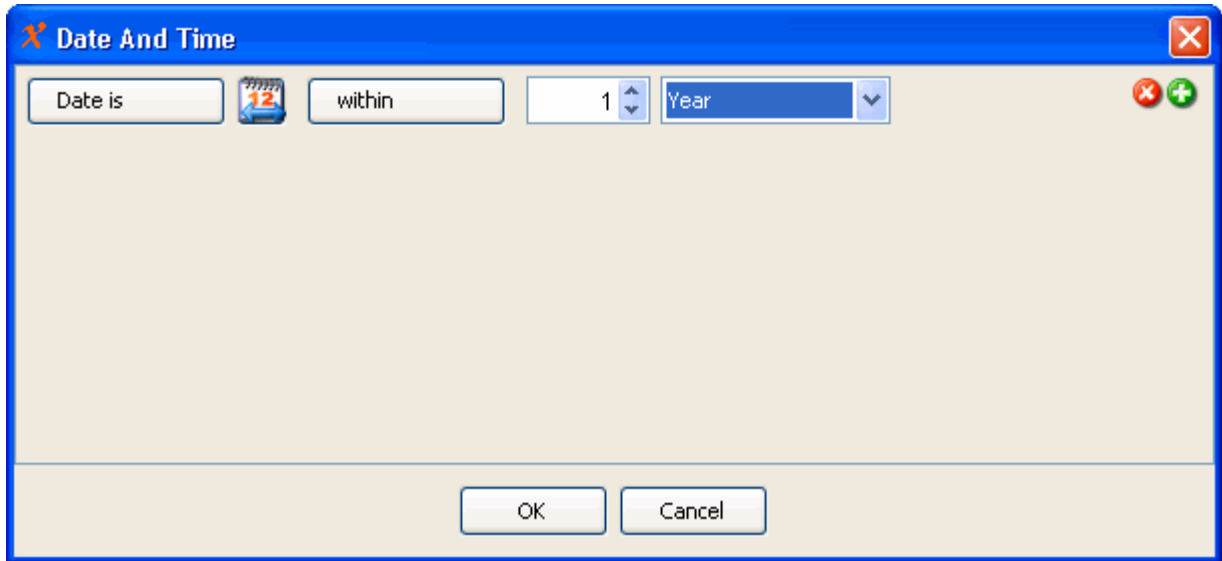
## Refining the Pricing Graph in the WHEN Condition


1. The **WHEN** condition provides the ability to restrict the results of the query to specific dates or times of interest. For our pricing graph you want to restrict the time period, for which you will **SHOW** your attributes, to the last year.
2. In the **WHEN** pane of the **Query Builder**, select the **Date Time Condition** button. From the **Date Time Condition** window, select the **Date or Time** button and select **Date is** from the items listed.



The first four items listed are date condition selections, the next four are time condition selections.

3. **Within 1 day** will appear in the **Date Time** window and it will be necessary to change **day** to **year** in the pull-down menu in order to complete our date condition. If the **Date Time Condition** window has **Date is within 1 year** highlighted, select **OK** to complete the date condition.

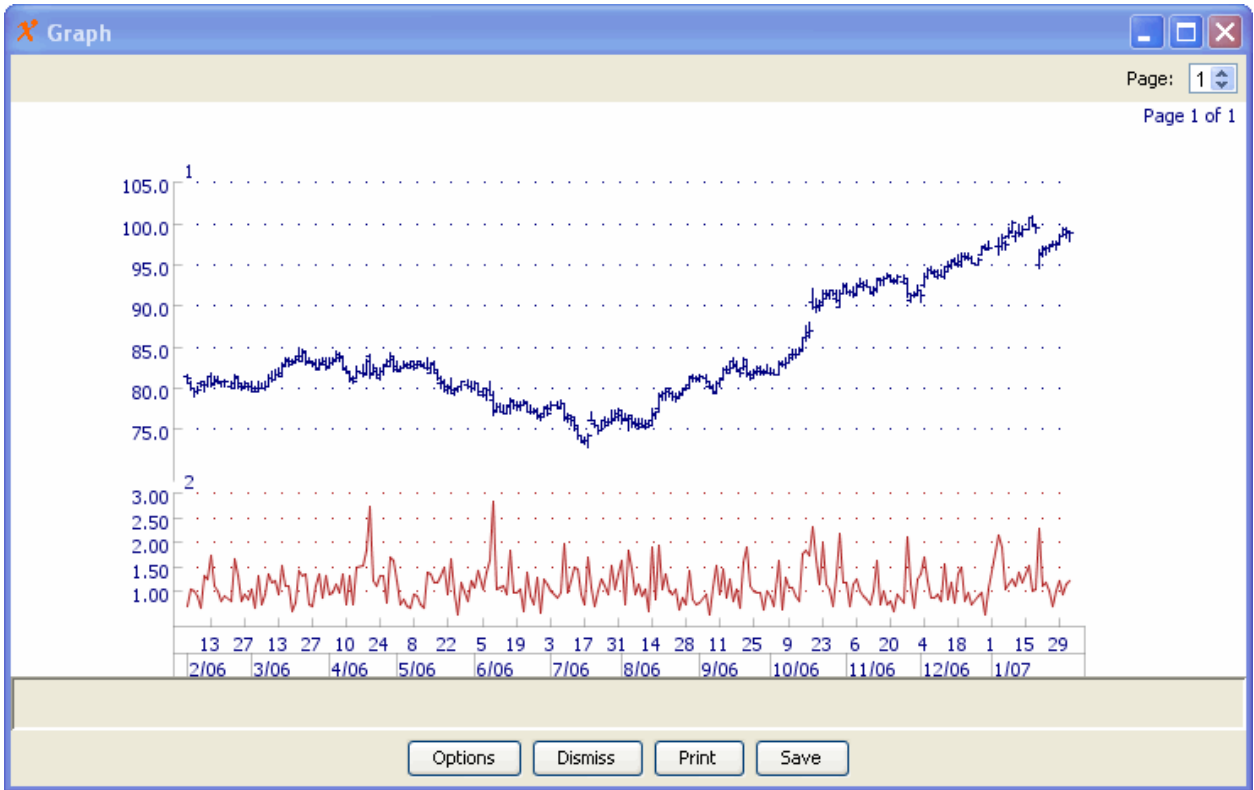


4. Notice that the query in the **Edit** pane now contains the two SHOW attributes along with a WHEN condition. The WHEN condition limits the period of time that the SHOW attributes (the Bar and daily range of GII.IBM.NYSE) is displayed to the last year. Select the **Graph**  button from the toolbar to graph the query.
5. To improve the clarity of the graph, you will use the graphic options to partition the attributes. Select the **Options** button at the bottom of the **Graph** window. There are several graphic options available to change to appearance of the graph.

For this lesson, you are limiting the first SHOW statement to the top quadrant of the graph (1: Bar of GII.IBM.NYSE) and the second SHOW statement to the bottom quadrant of the graph (2: High of GII.IBM.NYSE - Low of GII.IBM.NYSE). Under the **Attributes** pane of the **Graph Options** window, select the **1 (label)** button to bring up the **1 (label)** window .

From the **1 (label)** window, type 60 in the **View (bottom)** text field in the lower right hand corner of the display. The **View** option may be used to limit the display of attributes to certain quadrants of the graph. If the **1 (label)** window has **25** in the **View (bottom)** text field and **100** in the **View (top)** text field, select **OK** to return to the **Graph Options** window.

Next select the **2 (label)** window, type 40 in the **View (bottom)** text field in the lower right hand corner of the display. Keep the **100** View (top) setting. Select **OK** to close the **2 (label)** window and select **OK** to close the **Graph Options** window. The graph now is sectioned into two quadrants:



## Language Lesson

You have now completed a basic price graph by specifying what attributes you want to SHOW, WHEN certain date conditions are met. The execution units (select **Options>Execution Units** from the menu bar) are set to check the date condition on a daily basis. The attributes display for those days that meet the condition.

There may be several different attributes or markets of interest that a user could SHOW in a query for certain defined conditions. XMIM automatically assigns a numerical label to each attribute, so as to avoid confusion when the answers to a query display. For the example above, the first label appears as 1: and the second as 2:. You may change the **label** by editing the query in the **Edit** pane to give the attribute a proper name such as `Bar_GII.IBM.NYSE`. The assigned label can be any text and number combination as long as there are no spaces between the characters used in the label.


Attributes may be represented by a single time series (e.g., the closing price of IBM or `Close of GII.IBM.NYSE` in the XMIM language) or by multiple time series (e.g., the `High of GII.IBM.NYSE - Low of GII.IBM.NYSE` or the daily range of IBM). Attributes can be combined using simple arithmetic operations like addition and division, or complex functions such as correlation.

Conditions are added to a query by making selections from the **Date Time Condition**, **Custom Event** or **Market Event** buttons in the **WHEN** pane of the **Query Builder** window. In this lesson, you used the date condition `date is within 1 year`. Notice some of the other selections available in the **Date Time Condition** window when the **within** choice is selected. You can select specific events such as `is known date>election>Presidential Election Year`.

## Problem Solvers

1. Construct a query to graph the Bar and range of Dell Computer Corporation stock for the last 2 years.
2. Construct a query to graph the Bar of the front S&P futures contract as well as the daily range for the last 52 weeks.



To locate the symbol, select the **Search Database**  button then select the **Tree View** tab and open the folders for **Futures>Cme>s**.

## CHAPTER 7

---

# Using a Technical Indicator with a Price Graph

## Synopsis

### Objectives

1. Introducing studies.
2. Introducing graphic options.
3. Reiterating date conditions.

### Market Brief

Price graphs, like those used in the *Wall Street Journal* or other financial periodicals, are helpful aids used to determine where the current price of a security is in relationship to the prices the security traded at for some relevant past period of time. Researchers commonly employ the same technique to certain basic mathematical formulas. These formulas may be used to define trends based on changes within the formula's value relative to some previous period. When studying the price trend of two or more related securities, it is sometimes helpful to employ a moving correlation study to better understand the change in price of a security relative to the other. A correlation study may be employed with the price series as an aid in determining price movement.

## Problem



In this lesson, you will display the closing price for both the 30-year U.S. Treasury Bond futures contract and the S&P futures contract along with a one-month moving correlation study of both pricing series for the last two years.

The following text is in the **Edit** pane of the **Query Builder** window upon completion of the query:

```
SHOW
  SP: Close of SP
  US: Close of US
  Correlation: 1 month correlation of Close of SP and Close of US
WHEN
  Date is within 2 years
```



## Step-by-Step Solution

### Selecting the Attributes

1. This lesson requires a correlation study of two attributes along with the price history for those attributes. Begin by creating the Close of the S&P 500 Futures. To do this, select the **Search Database**  button find the S&P 500 Futures in the **Tree View**. If the directory path is still pointing to the last lesson's path, close the directory folders until you are at the topmost folder. Open the folders for **Futures > CME** then highlight the symbol **SP**, right-click and choose **Select** to add the selection **SP** and **Close** to the SHOW statement in the **Query Builder** window. Select **OK** to close the **Search Database** window and then select the **Add Attribute to Query**  button to add the SHOW statement to the **Edit** pane of the **Query Builder** window.

2. Use proper labels for your attributes, so highlight the label 1: in the **Edit** pane and type the name SP:.


```
SHOW
  SP: Close of SP
```

3. Using the **Search Database**  button (**Tree View** tab), find the symbol **US** for 30 Year U.S. Treasury Bonds Futures by opening the folders **Futures > Cbot** then highlight the symbol **US**, right-click and choose **Select** to add the selections **US** and **Close** to the SHOW statement in the **Query Builder** window. Select **OK** to close the **Search Database** window then select the **Add Attribute to Query**  button to add the SHOW statement to the **Edit** pane of the **Query Builder** window.

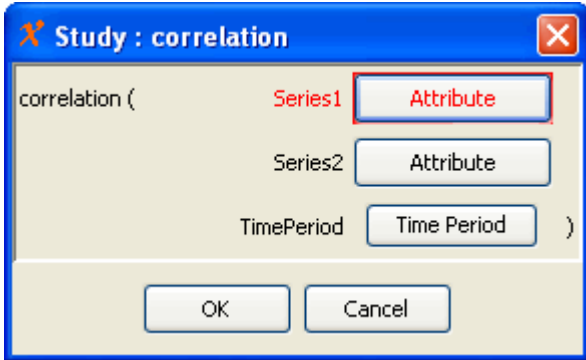
4. Use proper labels for your attributes, so highlight the label 1: in the **Edit** pane and type the name us:.



```
SHOW
  SP: Close of SP
  US: Close of US
```

5. You will now create the one-month correlation study of the S&P 500 Futures and the 30 Year U.S. Treasury Bonds Futures. XMIM has over 100 different studies available to use with the data series. A study is a mathematical or statistical calculation of a data series. The result of the addition of a study to an existing defined symbol and column is the creation of a new data series. Examples of commonly used studies are: moving averages, highest high and lowest low calculations, correlation and co-regression.

For the study you are going to use the correlation study. The first step is to enter the symbol **SP** into the **Symbol** field and keep the default column **Close**. To choose this study, select the **Studies**  button in the **SHOW** pane of the **Query Builder** window then choose **correlation** from the list and select **OK**.

The **Study: correlation** window opens.



6. The attribute for Series1 is already populated with the SP symbol and Close column (entered from the SHOW pane). To define the US attribute, select the **Attribute** button located next to next to **Series2** and enter **US** for the **Symbol** and select **Close** for the **Column** then select **OK** to return to the **Studies: correlation** window. Lastly, define the period of time for the study by selecting the **Time Period** button. **1 day** is the default period of time. Change **Days** to **Months** and select **OK** to return to the **Studies: correlation** window. Select **OK** to return back to the **Query Builder** window. Notice that the **Studies**  button is highlighted . Select the **Add Attribute to Query**  button to add the correlation study to the SHOW statement in the **Edit** pane.
7. You are going to use proper labels for your attributes so highlight the label 1 : in the **Edit** pane and type the name **Correlation**. The following shows how the query should look:


```
SHOW
  SP: Close of SP
  US: Close of US
  Correlation: 1 month correlation of Close of SP and Close of US
```

## Refining the Price Graph

### WHEN (Condition)

1. In the **WHEN** pane of the **Query Builder** window, select the **Date Time Condition** button then select the **Date or Time** button. You want to specify **Date is** and **within 2 years**. First select **Date is** from the pull-down menu then change **1** to **2** and **day** to **year**. If the **Date Time Condition** window has **Date is within 2 years** select **OK** to complete the date condition. The following shows the completed query:

```
SHOW
  SP: Close of SP
  US: Close of US
  Correlation: 1 month correlation of Close of SP and Close of US
WHEN
  Date is within 2 years
```

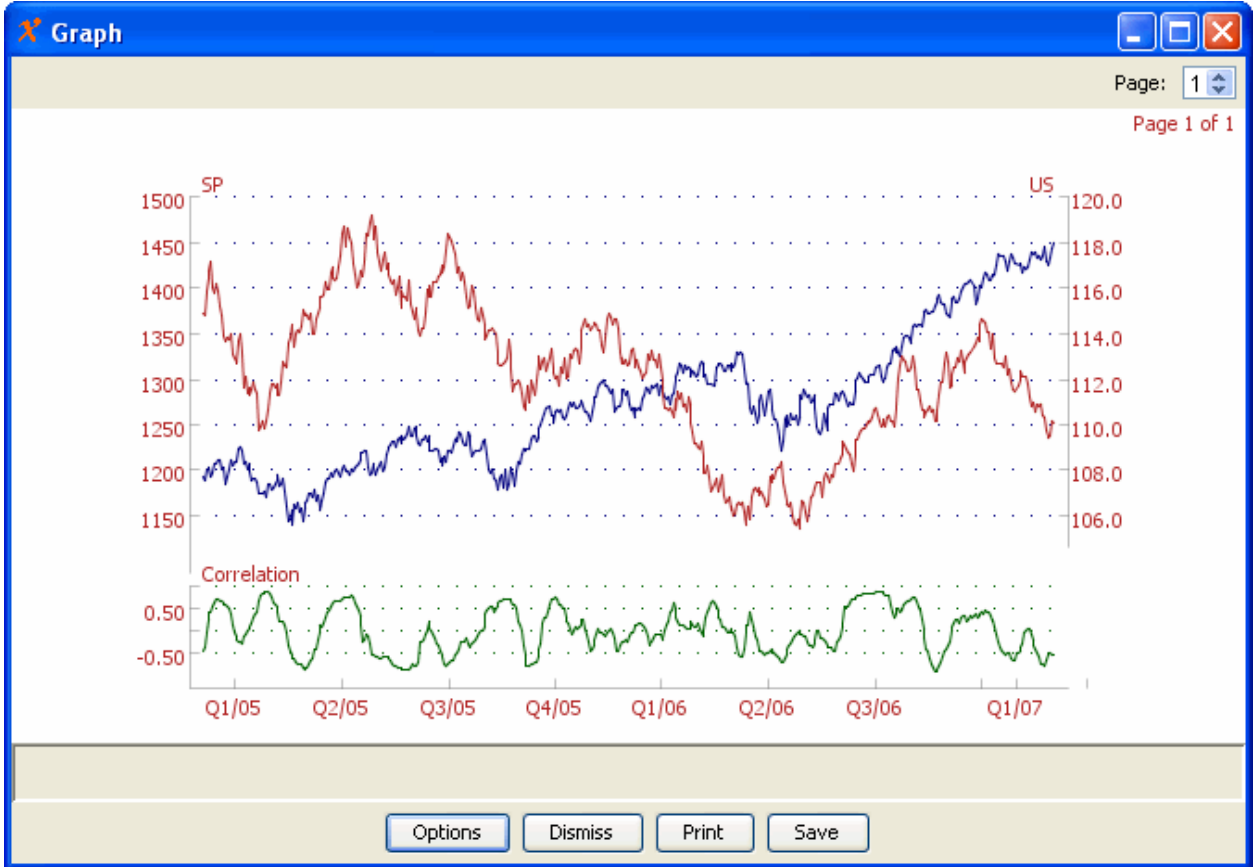
2. Select the **Graph**  button from the toolbar to graph the query. Note that the study will return the statistical correlation coefficient between the two time series over a 1 month moving time window. This study returns values between the range of 1 (perfect correlation) and -1 (perfectly negative correlation).
3. To improve the clarity of the graph, you will use the Graphic Options to partition the attributes. Select the **Options** button at the bottom of the **Graph** window. There are several graphic options available to change to appearance of the graph.

For this lesson you are limiting the correlation study to the bottom quadrant of the graph. Under the **Attributes** pane of the **Graph Options** window, select **Default** to bring up the **Default Options** window that corresponds to the whole graph.

From the default window, type 25 in the **View (bottom)** text field in the lower right hand corner of the display. The View option may be used to limit the display of attributes to certain quadrants of the graph. If the default window has 25 in the **View (bottom)** text field and 100 in the **View (top)** text field, select **OK** to return to the **Graph Options** window.

4. Next, under attributes select **Correlation** to bring up the correlation window that corresponds to the attribute labeled Correlation. Type 20 in the **View (top)** text field. If the correlation window has 0 in the **View (bottom)** text field and 20 in the **View (top)** text field, select **OK** to return to the **Graph Options** window. Select **OK** to change the graphic options.
5. XMIM only has the capability to show two-reference axis at one time. If you are using multiple data series in the graphs, select on the data series of interest to change to reference axis. Each axis will retain the color of its respective data series.

The chart shows the final result of your query, displaying the correlation study in the bottom quadrant of the window.



## Language Lesson

You have now completed a basic price graph with a technical study overlay by specifying a study of an attribute.

Studies are mathematical, statistical, and date functions that are compiled into the XMIM code for speed. Server macros, which are included in the studies list, provide calculations reduced down to a single statement in the query language. Unlike the other studies, however, server macros exist outside of the program code, and can be created, edited and modified by the user with a simple text editor. These server macro files are located in the **xmim/library** directory within the **attr** and **column** sub-directories. Server macros tend to include more advanced technical indicators, statistical, and astrological calculations. For a detailed description of the studies and server macros, see the "[Studies and Server Macros](#)" chapter in the *XMIM User Guide*.

With regard to time expressions used within XMIM studies, there are two ways to specify the time period for a study. The default method is to specify a number (n) and a calendar measurement or some 'time unit' expression (i.e., day, month, year or quarter) in the top most area of the **Time Period** window. For example, you can specify a time period such as:

- "10 day" (where 10 represents the number and day refers to the time-unit); or
- "9 value" (where 9 represents the number specified and value is the time-unit that refers to actual values available in the data series); or
- "30 minute" (depending upon the symbol used there may be intraday studies available); or
- "10 calendar year".

The time unit is defaulted to **day** but may be changed by pulling down the menu and selecting a different time unit. This default method will include all dates extending back from the current calculation date to some point back in time as in the expression. The other method of specifying the time period is to use the **From-To** buttons in the **Time Period** window. These buttons allow you to specify exactly the ending and starting points of the window by making selections from the pull-down menu. The selections available for either button are: Today, Begin of Time/End of Time, Time Offset or Condition. Usually you will want the **From** date or the **To** date to be **Today**.

## Problem Solvers

Create a 2-week correlation study of the close of the Dow Jones Industrial Average Index (DJIA) and NASDAQ Composite Share Index (NASD) for the last 6 months.



To locate these two symbols, select the **Search Database**  button then select the **Tree View** tab. Open the folders for **Indices > U.S.Indices**.

## CHAPTER 8

---

# Basic Event-Driven Analysis using Date Conditions

## Synopsis

### Objectives

1. Reiterating studies.
2. Setting a time offset.
3. Introducing the condition connector.
4. Using date files within the date condition.

### Market Brief

Seasonality studies are commonly used as a research device to analyze price patterns surrounding certain time periods. For example, what happens to stock prices during the month of January or at year-end or to bond prices after the release of an inflationary economic number? Oftentimes, a researcher will employ a price graph to analyze price patterns surrounding certain significant dates. XMIM has the ability to supplement this technique by identifying certain significant dates through the use of the WHEN condition and analyzing the price movement for those dates using the SHOW attribute.




## Problem

For this lesson, isolate those periods of time within the last fifteen years when there was an employment release (USA BLS Nonfarm Payroll). Using this date as an anchor date, calculate the move in the 30-year U.S. Treasury Bond futures contract from the anchor date until one day later. In the XMIM language, what you want to SHOW is the 1 day move of the close of the U.S. Treasury Bond WHEN the date is a USA BLS Nonfarm Payroll release date within the last fifteen years. After the query is completed, the following text will appear within the **Edit** pane of the **Query Builder** window:

```
SHOW
  1: percent_move from today to 1 day later  of Close of US
WHEN
  Date is within 15 years
AND
  Date is in "USA_BLS_Nonfarm_Payroll"
```

## Step-by-Step Solution

### Selecting the Study of an Attribute


1. The **SHOW** attribute used in this lesson involves a study of an Attribute. Bring up an Attribute Window by selecting the **SHOW** Attribute button. From the Attribute Window select the **Search Database**  icon to find the 30 Year U.S. Treasury Bonds Futures contract under the **Futures > Cybot** folders; or, type the symbol **us** into the text field next to **Symbol**.
2. We will keep the default column **Close** for this example.
3. If you select **OK** at this point you see the sampled closing price for the U.S. Treasury Bond. However, what you want to do is to create a study on that price series. Select the **Studies** button from the **SHOW** statement portion of the **Query Builder**. From the **Studies** list select **% move**.
4. Within the **Study: % move** window, select the **Time Period** button. Then select the radial button next to **From**. The default selection is **Today**. Today is a generic concept in XMIM and will take on the date that meets the **WHEN** Condition. Keep the **Today** selection.
5. Also keep the default settings of **1 Day Later**. Select **OK** to return to the **Study: % move** window. The **Study: % move** window should now have **From: Today** and **To: 1 Day Later** highlighted. If it does, select **OK** to return to the **Query Builder**.
6. The study of the attribute is now complete. Notice that the **Studies**  button is highlighted. Select the **Add Attribute to Query**  button to add the study information to the query in the **Edit** pane.

```
SHOW
  1: % move from today to 1 day later of Close of US
```


### Refining the Price Analysis in the WHEN (Condition)

If we were to execute the query with just the **SHOW** portion completed, the day move would be displayed for all available dates within the database. However, we only want to see the one day move that occurs following a Nonfarm release after 1990. In other words, we want to restrict results of our query to a specific set of market dates.

1. In the **WHEN** pane of the **Query Builder**, select the **Date Time Condition** button then select the **Date or Time** button.
2. We want to specify **Date is within 15 Years**. In order to create this query select **Date is** from the pull-down menu. Keep the **within** button selection and change **1 Day** to **15 Years**. The **Date Time** window should have **Date is within 15 Years** highlighted.

- Next, add another date condition by selecting the **Add Condition**  button. There are two types of date criteria available: generic calendar dates that might be found on any calendar and special date events that are specific to the investment community. To add the date event condition: `Date is in "USA_BLS_Nonfarm_Payroll"` keep the **AND** logical operator then select the the **Date or Time** button and choose **Date is** from the list. Next, select the **within** button and choose **in file>server file** from the list. To locate the `USA_BLS_Nonfarm_Payroll` date event select the **Browse** button and open the folders for **Economic>UnitedStates>Government** and choose **USA\_BLS\_Nonfarm\_Payroll** from the list. Select **OK** to close the **Browse** window. If the **Date Time Condition** window shows **Date is in "USA\_BLS\_Nonfarm\_Payroll"** then select **OK** to close the **Date Time Condition** window.



The **Refresh Condition**  button will refresh the **Date Time Condition** window so that a new date or time condition can be constructed.

- Your query is now complete:

```
SHOW
  1: percent_move from today to 1 day later  of Close of US
WHEN
  Date is within 15 years
AND
  Date is in "USA_BLS_Nonfarm_Payroll"
```

Graphing the query would give us a nonsensical chart; so, instead select **Report** from the toolbar to view the tabular results of the query. As mentioned earlier the left column represents the corresponding dates that meet our conditions and the furthest right column is the study of the data series or attribute. At the bottom of the report is statistical information about the entire population of the results.

- Select **Dismiss** to close the **Report** window.
- The next two lessons will build upon this query so we will have to **Save** the language of this query before selecting **New** to work on the Problem Solvers.

## Language Lesson

In this lesson we reviewed a basic mode for event-driven analysis by creating a study of an attribute using the time offset feature. Additionally, we created a compound condition using the logical operator "AND" within our query.

There are two ways of specifying the time period for a study. The default method is to specify a number (n) and a calendar measurement or some 'time unit' expression (that is day, month, year or quarter) in the **Time Period** window. For example, you can specify a time period such as 10 `day` (where 10 represents the number and day refers to time unit) or 9 `value` (where 9 represents the number specified and value is the time unit that refers to actual values available in the data series) or 30 `minute` (depending upon the symbol used there may be intraday studies available) or 10 `calendar year`. The calculation window using the default method will include the dates extending back from the current calculation date to the point back in time specified in the time period expression. The other method of specifying the time period, which we used in the lesson above, is to use the **From-To Time** button located in the **Time Period** window. These buttons allow you to specify exactly the ending and starting points of the window by making selections from the pull-down menu. The selections available for either button are: Today, Begin of Time/End of Time, Time Offset or Condition. Usually you will want the **From** date or the **To** date to be **Today**. Remember that **Today** is a generic term in XMIM and will take on the date of the calculation.

## Problem Solvers

1. Create a study that analyzes the 1-day percent move of the 30-year U.S. Treasury Bond futures contract following all a Nonfarm economic release falling after 1993.
2. Create a study that analyzes the 1-week move of the front S&P futures contract leading up to all U.S. holidays.

## CHAPTER 9

---

# Basic Event-Driven Analysis using Market Conditions

## Synopsis

### Objectives

1. Reiterating studies.
2. Limiting the attribute using the WHEN condition custom event.

### Market Brief

In the previous lesson, we mentioned that in reviewing a price graph it is possible to note certain changes in the price of securities associated with major market dates. What if, instead of focusing on a market date in the query, we described the price movement of the security as a condition that had to be met in order to SHOW our defined attribute. In other words what if we isolated those dates that made certain price movements and reviewed the price action of our security following the defined trend? This sort of analysis is done all the time in market industry periodicals. It is not uncommon for the Wall Street Journal or other newspaper to carry headlines that read "Stocks Plunge 300 points, Year's Worst Fall...Should We Expect a Rebound?" Wouldn't it be interesting to isolate those dates in the past when the market sold off by a similar amount to see what happened to the price of the security?

## Problem


Using the previous lesson, what would happen to the results of our query if the actual economic release comes in higher than the consensus estimate?

In the XMIM language, you want to **SHOW** the 1-day percent move in the 30 year U.S. Treasury Bond futures contract **WHEN** the date is a USA BLS Nonfarm Payroll release date after 1990 and the actual economic release is more than the consensus estimate. After the query is completed, the following text appears within the **Edit** pane of the **Query Builder** window:

```
SHOW
  1: percent_move from today to 1 day later  of Close of US
WHEN
  Date is after 1990
AND
  Date is in "USA_BLS_Nonfarm_Payroll"
AND
  _Implicit_ of NONFARM_ACT is more than _Implicit_ of NONFARM_EST
```

## Step-by-Step Solution

### Selecting an Additional Condition

1. You want to add another condition to the existing saved query used in the previous lesson. Open the saved query used in the last lesson.
2. Select the condition connector **And** then select the **Custom Event** button located in the **WHEN** pane of the **Query Builder** to build the custom event condition.
3. There are two ways to build a custom event condition. Custom event conditions are often used to compare an attribute to another attribute or to compare the attribute to a constant or variable (normally a number representing price). A custom event condition may be built by completing either two panes of the **Custom Event** window (the left attribute and a conditional operator) or by completing three panes of the **Custom Event** window (the left attribute, a conditional operator and the right attribute). For this query, you will use all three panes of the **Custom Event** window: the **\_Implicit\_ of NONFARM\_ACT** (this is the complete information in the **Left Attribute** portion of the window) **is more than** (this is the complete information for the **Conditional Operator**) the **\_Implicit\_ of NONFARM\_EST** (this is the complete information for the **Left Attribute** window).
4. In the **Custom Event** window, for the **Left Attribute**, type in `NONFARM_ACT` into the text field next to **Symbol** or use the **Search Database** icon and the **Tree View** to locate the symbol in the folder path: **EconomicIndicators > USA\_Economic > USA\_Actual**. The column **\_Implicit\_** is the only column selection available. If the **Left Attribute** has **NONFARM\_ACT** and **\_Implicit\_** highlighted, select the **Continue** button.
5. Remember that we need to fill out three panes. The next portion of the **Custom Event** window to complete is the **Conditional Operator**. You are comparing the closing price of our security with its price at the open by using the Conditional Operator. Change the Conditional Operator from **is exactly** to **is more than** and then select the **Continue** button.
6. The last area you need to complete is the custom event condition in the **Right Attribute** pane. Remember, the condition will be met if the **\_Implicit\_ of NONFARM\_ACT is more than \_Implicit\_ of NONFARM\_EST**. The first two panes completed so far are **\_Implicit\_ of NONFARM\_ACT is more than**. To complete the sentence within the final or **Right Attribute**, type in `NONFARM_EST` in the text field next to **Symbol** (the only **Column** available is **\_Implicit\_**). If the final **Right Attribute** has **NONFARM\_EST** and **\_Implicit\_** highlighted, select **OK**.
7. Select the **Report**  button in the toolbar to produce the report. Notice the difference in statistics of our results from the previous lesson. By including an additional market condition we have decreased the number of results but also we have changed the number of positive results.

When creating queries, add the conditions one at a time to see what effect each additional condition has on the answer population.

## Language Lesson

In this lesson, we reviewed the effect of including a market condition using a custom event on the population of our results.

There are many places in the XMIM language where attributes can be selected for use. A left or right attribute pane indicates that you can build an attribute expression in the query syntax at that point. The SHOW part of a SHOW / WHEN query is a typical place to use an attribute expression. Often, you are trying to produce results based upon certain conditions or patterns in the market. In order to do this, it is necessary to reference or compare the attribute to some other attribute or constant by creating a WHEN condition. Stated another way, users often want to SHOW an attribute WHEN the attribute has reacted in some specified pattern.

The custom event condition's general format is as follows:

```
<Left Attribute> <Conditional Operator> <Right Attribute>
```

The format is rather simple to understand: some specified attribute, (left attribute) does something in comparison to, i.e., is more than (conditional operator) some other specified attribute, (right attribute). For convenience, the **Conditional Operator** pane of the **Custom Event** window contains some terminal selections that are shortcuts taking away the need to specify a right attribute. Thus, in some instances it is possible to form a complete condition using just the <Left Attribute> and the <Conditional Operator>. Whenever you finish an pane in the **Custom Event** window by selecting **Continue** the next pane becomes active in natural sequence to finish the menu construction of the condition.

Most of the functions available in the **Conditional Operator** window are pretty self-explanatory. However, the function **is defined** or **is not defined** located in the second line bears review. Both of these conditional operator options allow you to test whether a value exists for a specified attribute. An attribute is not defined whenever the results of execution of the query would be NaN (not a number), i.e., if there is no value in the database for the specified attribute. A few of the data series in the database may be missing data because of the nature of the series (i.e., the data available in the market is scarce or not provided by many data suppliers.) As a matter of preference, you may choose to disregard certain series that are missing data. The easiest way to identify missing data is to use the **is not defined** function.

## Problem Solvers

1. Create a study that analyzes the 1-day move of the French Franc, following all Producer Price Index release dates falling after 1995 whenever the actual Producer Price Index release is less than the consensus estimate.
2. Create a study that analyzes the 1-week move of the 30 year U.S. Treasury Bond following all Home Sales release dates within the last 3 years whenever the actual Home Sales release is less than the consensus estimate.



## CHAPTER 10

# Event-Driven Analysis using Weather Data

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## Synopsis

### Objectives

1. Using the WHEN condition repeat function.
2. Reiterating the use of multiple conditions.
3. Introducing geophysical data.
4. Introducing execute options.

### Market Brief

There are two basic schools of market analysis: technical analysis and fundamental analysis. Most of the research tools discussed in the earlier chapters are commonly associated with technical analysis. Given the wealth of LIM data available, several types of fundamental analysis can also be generated.

There is a wealth of data series available to an agriculture futures trader (such as weather data or sentiment data) that can be used to develop interesting research. For example, heavy buying or selling of the futures contract could be the direct result of unforeseen changes in weather patterns.

## Problem

You will analyze the effect of a third- or fourth-quarter downpour of rain in Chicago on the price of the front Soybean futures contract.

In the XMIM language, you want to **SHOW** the 1 week move of the front Soybean futures contract **WHEN** the date is any third- or fourth-quarter where the rain precipitation is more than .35 repeated for the previous 2 days and current day. After the query is completed, the following text displays within the **Edit** pane of the **Query Builder** window:

```
SHOW
  1: move from today to 1 week later  of Close of S
WHEN
  RainPrecip of CHICAGO.OHARE.IL is more than 0.35
  repeated for the previous 2 and current day
AND
  {
    Date is third quarter
  OR
    Date is fourth quarter
  }
```




## Step-by-Step Solution

### Select the Study of the Attribute

1. You want to take a look at the 1-week move of the close of the front Soybean contract.




When using studies, XMIM conveniently substitutes shorter frequencies of time for periods missing within the database. For example, if the query asks for a 4-day average and only 3 days are available for the study, XMIM will return a 3-day average. The term *value* represents actual values in the database and is sometimes substituted for ‘day’ or other frequencies to ensure that the studies calculate the specified number of values and don’t substitute a shorter frequency for periods missing within the database. For example, on a non-trading holiday XMIM will return a result for a study that requires *n day* average because of the substitution feature in the software; however, the use of *n value* average will return NaN.

2. In the **SHOW** pane of the **Query Builder** window type `s` into the **Symbol** field (or find the symbol using the **Search Database**  button). Next, select **Close** from the **Column** pull-down menu.
3. Select the **Studies**  button and select **move** from the list. The **Study: move** window opens. Select the **Time Period** button then select the radio button for the **FROM/TO** selection. In the **From** pull-down select **Today**. In the **To** pull-down, select **Time Offset**. In the **Time Offset** window, select **1** if not already highlighted. From the next pull-down change **Day** to **Week** and from the next pull-down, change **Ago** to **Later**. Select **OK** to close the **Time Offset** window and **OK** to close the **Time Period** window. Select **OK** to close the **Study: move** window then select the **Add Attribute to Query**  button to add the statement to the **Edit** pane of the **Query Builder** window.

The following shows the query statement so far:

```
SHOW
  1: move from today to 1 week later of Close of S
```

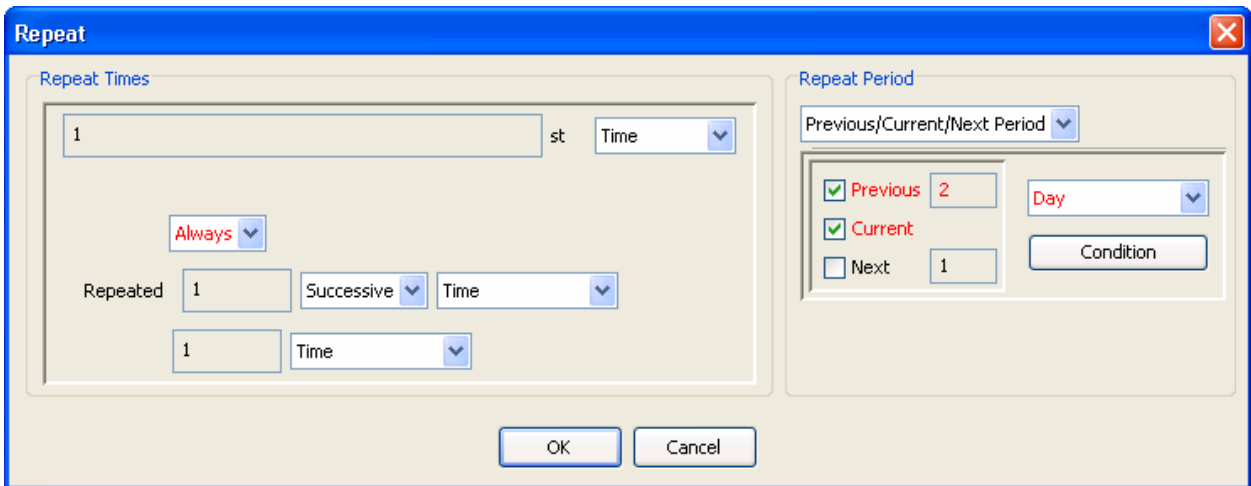
### Creating a Market Condition Using Weather Data

1. The custom event condition used in this lesson is a condition that makes a comparison of an attribute (the rain precipitation in Chicago). In the **WHEN** pane of the **Query Builder** window, select the **Custom Event** button. In the **Custom Event** window, in the **Left Attribute** pane of the window, you need to look up our weather site, the O'Hare airport in Chicago, Illinois. Select the **Search Database**  button and in the **Tree View** open the folders for **Weather > Geophysical > Geo\_N.Amer > Geo\_USA.East**

- > **Geo\_Illinois**. Make the final symbol selection of **CHICAGO.OHARE.IL** then right-click and choose **Select**. Select **OK** to close the **Search Database** window and return to the **Custom Event** window. From the **Column** pull-down menu, select **RainPrecip** then select the **Continue** button to enter the conditional operator.
2. From the **Conditional Operator** pane of the **Custom Event** window select the radio button for **is exactly** then change **exactly** to **more than** from the pull-down menu. Select the **Continue** button to go to the **Right Attribute** pane.
  3. In the **Right Attribute** pane select the **Variable** button and choose **Constant** from the list. Type **.35** in the Constant field. The following shows the completed **Custom Event** window.



- Use the repeat function to repeat the weather condition for the previous 2 days and current day. In the **WHEN** pane of the **Query Builder** window, select the **Repeat** button. The **Repeat** window should have two columns. You will ignore the left-most column and focus on making changes to the **Repeat Period** column on the right. You want the weather condition to be repeated for the previous 2 days and current day so you will have to uncheck **Next**. You need to change the number from 1 to 2 in the text field next to **Previous**. If the **Repeat Period** pane of the **Repeat** window has **Previous 2, Current** and **Day** highlighted select **OK**. The following shows the **Repeat** window entries:




Select **OK** to add the repeat statement to the **Edit** pane of the **Query Builder** window. The following shows how the query should look so far:

```
SHOW
  1: move from today to 1 week later  of Close of S
WHEN
  RainPrecip of CHICAGO.OHARE.IL is more than 0.35
  repeated for the previous 2 and current day
```

- Next, select the **AND** logical operator from the list in the **WHEN** pane of the **Query Builder** window and proceed to add the two date conditions.
- In the **WHEN** pane of the **Query Builder** window, select the **Date Time Condition** button then select the **Date or Time** button. Next, select **Date is** from the list. Select the **within** button and choose **in quarter >third quarter** from the pull-down menu. The **Date Time Condition** window should have **Date is third quarter** entered.
- To add the final date condition select the **Add Condition** button. Next, select the **OR** logical operator, then select the **Date or Time** button. Choose **Date is** from the list, then select the **within** button and choose **in quarter > fourth quarter** from the pull-down menu. If the **Date Time Condition** window has **Date is Fourth Quarter** listed, select **OK** to add the statement to the **Edit** pane and return to the **Query Builder** window.
- The two date conditions (**Date is third quarter** or **Date is fourth quarter**) are obviously mutually exclusive. Use braces to denote that one or the other of these conditions must be met along with the first


two aforementioned conditions in order to SHOW our attribute. In the **Edit** pane add the curly braces to the query so that the query matches the following:


```
SHOW
  1: move from today to 1 week later of Close of S
WHEN
  RainPrecip of CHICAGO.OHARE.IL is more than 0.35
  repeated for the previous 2 and current day
AND
  {
    Date is third quarter
  OR
    Date is fourth quarter
  }
```

- Execute the query by selecting the **Report**  button from the toolbar.

Date	Day	1
10/06/1959	Tue	1.8800
09/13/1961	Wed	-6.5000
09/14/1961	Thu	-2.0000
09/25/1961	Mon	-2.8700
09/14/1970	Mon	-8.5000
09/15/1970	Tue	-2.5000
09/24/1970	Thu	-4.7500
08/20/1990	Mon	7.2500
08/21/1990	Tue	7.7500
10/09/1990	Tue	-24.0000
10/10/1990	Wed	-10.5000
11/03/1992	Tue	-5.5000
08/05/1998	Wed	4.0000
08/25/1998	Tue	-14.0000
09/20/2001	Thu	-11.7500
10/24/2001	Wed	4.0000
11/04/2003	Tue	20.0000
12/01/2006	Fri	-21.0000
Avg		-3.8328
AvgPos		7.4800
AvgNeg		-9.4892
PctPos		33.3333
PctNeg		66.6667
Maximum		20.0000
Minimum		-24.0000
StdDev		10.6574
ZStat		-0.3596
Variance		113.5793

18 Occurrences

- Notice that there are several consecutive days listed on the left-most column of the XMIM report. If you were to actually take a position based on these conditions, it might be safe to say that you would react to the first day that meets the conditions or the first adjacent value. XMIM allows you the ability to look at the first adjacent days by changing the default **Execute Options** settings. Select **Options>Execute Options** from the menu bar (or select the Execute Options  button from the toolbar) then select the **Report** tab. Under the **Report Manipulation** pane change **Display: All Adjacent Values** to **Display: First Adjacent Value** and select **OK**.

11. Select the **Report**  button from the toolbar to re-execute the query. Notice that the number of occurrences dramatically decline because of the changed default settings.

Date	Day	1
10/06/1959	Tue	1.8800
09/13/1961	Wed	-6.5000
09/25/1961	Mon	-2.8700
09/14/1970	Mon	-8.5000
09/24/1970	Thu	-4.7500
08/20/1990	Mon	7.2500
10/09/1990	Tue	-24.0000
11/03/1992	Tue	-5.5000
08/05/1998	Wed	4.0000
08/25/1998	Tue	-14.0000
09/20/2001	Thu	-11.7500
10/24/2001	Wed	4.0000
11/04/2003	Tue	20.0000
12/01/2006	Fri	-21.0000
Avg		-4.4100
AvgPos		7.4260
AvgNeg		-10.9856
PctPos		35.7143
PctNeg		64.2857
Maximum		20.0000
Minimum		-24.0000
StdDev		11.5773
ZStat		-0.3809
Variance		134.0335

14 Occurrences

12. **Dismiss** the report and select the **New** button to clear the **Edit** pane for the next lesson.

## Language Lesson

An important calculation subtlety of XMIM is that a specified time period may include holidays or missing data thereby effectively reducing the actual number of data points used in a study. For example, a 15-day moving average that spans both Christmas and New Year's Day will be calculated based on only 13 price samples. Many users prefer to calculate studies based on the last “ $n$  values” (this is the last actual  $n$  data points irrespective of holidays or missing data) instead of the last “ $n$  time” (i.e., day) periods. You can accomplish this in the XMIM language: specify, instead of “days” as the time period, the keyword “values” and the study will be calculated using the specified number of values from the data series. This concept is particularly important where the study is a triggering condition for the ORDER query (back testing trading ideas using an ORDER query will be discussed in [Chapter 14, “Back-Testing a Long-Only Moving Average Trading Strategy”](#)). If a date is a holiday, such as New Years Day, XMIM will return data on a non-trading day because of the calculation subtlety discussed. Because it is impossible to ‘place’ a trade on a holiday this trading signal will be ignored.

## Problem Solvers

For any date in December, January or February following 1990 where the low temperature at the New York LaGuardia Airport, is down over 20% for two days in a row, show the move from this date (today) to 3 days later of the front Natural Gas contract (NG).



## CHAPTER 11

---

# Event-Driven Analysis on Multiple Symbols

## Synopsis

### Objectives

1. Using a **LET** statement with multiple symbols.
2. Using the **How Do I Say** feature.

### Market Brief

Often a query that provides useful insight regarding the historical patterns of one symbol can be applied to multiple symbols. In previous lessons the problems focused the analysis on one symbol and how that one symbol reacted to certain conditions, but with the XMIM LET statement it is possible to run that same query on a list of symbols all at once.



## Problem

You will take a look at what's happened in the past to the NASDAQ, S&P 500 and NYSE indices, when the index is up 9 days in a row. You will study the percent move from the event date to 1, 2, and 3 days later. Using the **LET** feature, you will set a variable to equal our list of indices so that when you run the query, you will get separate results for each index. You will also use the **How Do I Say** feature to provide syntax assistance with our event condition that the index is up 9 days in a row. After the query is completed, the following text will appear within the **Edit** pane of the **Query Builder** window:

```
LET
  @MyList = NASD, SPX, NYSE

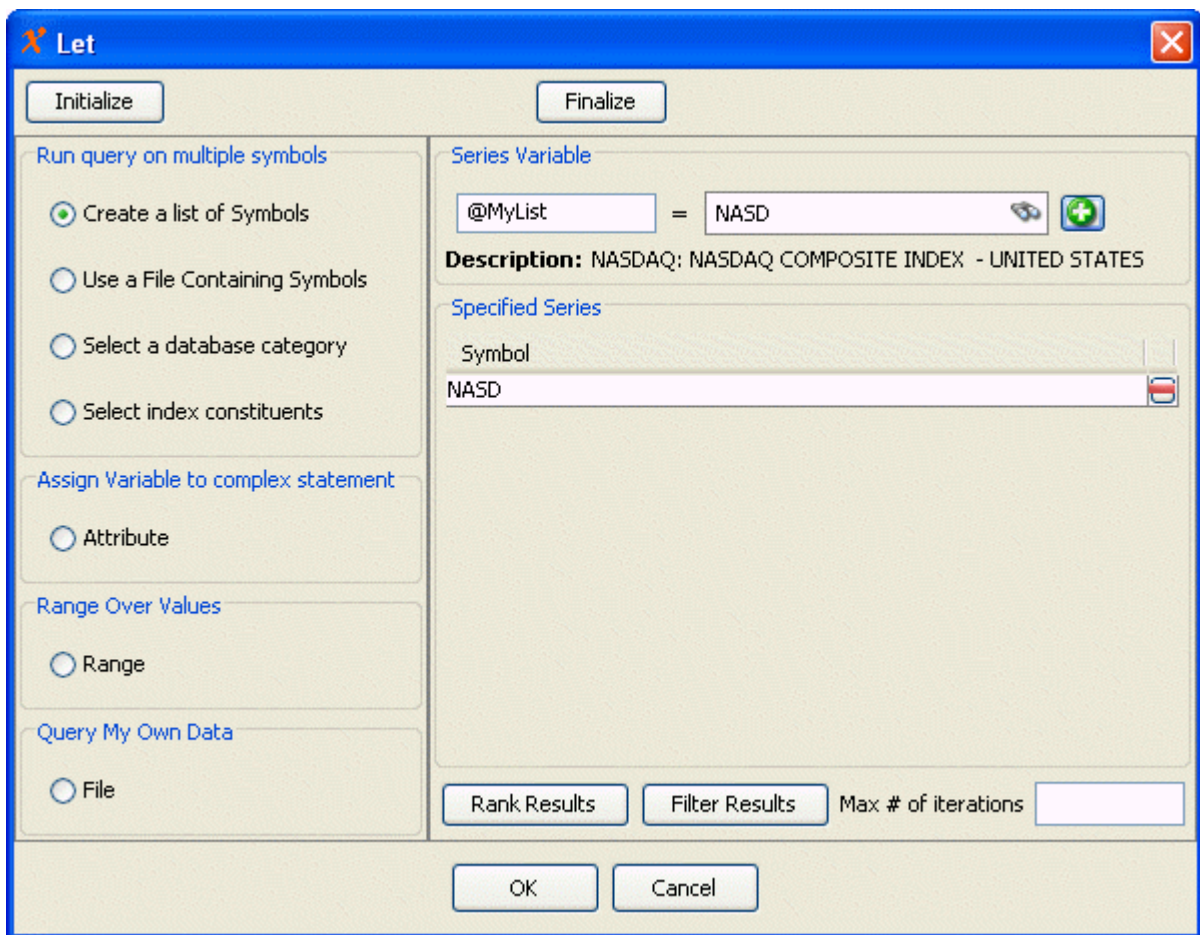
SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
  3: percent_move from today to 3 days later of @MyList
WHEN
  @MyList is up
  repeated for the previous 8 and current value
```

## Step-by-Step Solution

1. Select the **LET**  button from the toolbar to open the **LET** window. In the **Series Variable** pane keep the entry **@MyList** for the variable name and type **NASD** into the next field for the symbol name. Select the Enter  button to add the symbol name **NASD** to the **Specified Series** pane.





The variable names shown are just suggestions. Variable names are user-defined but should be in mixed case or start with an @ sign so that there is not a possibility of duplicating a MIM symbol name. Also, no spaces are allowed.





2. Next, type the symbol name **SPX** into the symbol field and select the **Enter**  button to add **SPX** to the **Specified Series** pane.



You may use the **Remove Item**  button to remove a symbol name from the **Specified Series** pane, if needed.


- Next, type the symbol name `NYSE` into the symbol field and select the **Enter**  button to add **NYSE** to the **Specified Series** pane. Select the **OK** button to close the **LET** window. The following displays in the **Edit** pane:

```
LET
  @MyList = NASD, SPX, NYSE
```

- In the **SHOW** pane select the  button and change the selection from **Symbol** to **Variable**. In the **Variable** field type in the name `@MyList`. Select the **Studies**  button and choose **% move** from the list.
- In the **Study: % move** window, select the **Time Period** button and select the radial next to **From Today To 1 Days Later**. Select the **OK** button to close the **Time Period** window then select the **OK** button to close the **Study: % move** window.





Notice that the **Studies**  button is highlighted to show that an entry was made.

- In the **SHOW** pane select the **Add Attribute to Query**  button. The following shows the entries so far in the **Edit** pane.


```
LET
  @MyList = NASD, SPX, NYSE

SHOW
  1: percent_move from today to 1 day later of @MyList
```

- Next, In the **SHOW** pane select the  button and change the selection from **Symbol** to **Variable**. In the **Variable** field type in the name `@MyList`. Select the **Studies**  button and choose **% move** from the list.
- In the **Study: % move** window, select the **Time Period** button and select the radial next to **From Today To 1 Days Later**. Select the **To** button and choose **Time Offset** from the list. In the **Time Offset** window change **1 Day Later** to **2 Day Later**. Select the **OK** button in each window to return to the **Query Builder** window.





Notice that the **Studies**  button is highlighted to show that an entry was made.

- In the **SHOW** pane select the **Add Attribute to Query**  button. The following shows the entries so far in the **Edit** pane.


```
LET
  @MyList = NASD, SPX, NYSE

SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
```

10. Next, In the **SHOW** pane select the  button and change the selection from **Symbol** to **Variable**. In the **Variable** field type in the name @MyList. Select the Studies  button and choose % **move** from the list.
11. In the **Study: % move** window, select the **Time Period** button and select the radial next to **From Today To 1 Days Later**. Select the **To** button and choose **Time Offset** from the list. In the **Time Offset** window change **1 Day Later** to **3 Day Later**. Select the **OK** button in each window to return to the **Query Builder** window.




Notice that the **Studies**  button is highlighted to show that an entry was made.

12. In the **SHOW** pane select the **Add Attribute to Query**  button. The following shows the entries so far in the **Edit** pane.

```
LET
  @MyList = NASD, SPX, NYSE

SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
  3: percent_move from today to 3 days later of @MyList
```

13. Select the **How Do I Say**  button from the toolbar. In the **How Do I Say** pane select **IBM is Up 5 times in a row**. Select the **Customize** button and in the **Customize** pane change **5** to **9** so that the statement is **IBM is up 9 times in a row**. Select the **Add to My Query** button. The following shows the query in the **Edit** pane:

```
LET
  @MyList = NASD, SPX, NYSE

SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
  3: percent_move from today to 3 days later of @MyList


WHEN
  IBM is up
  repeated for the previous 4 and current value
```

14. In the **WHEN** condition replace **IBM** with **@MyList** by editing the query in the **Edit** pane. The following shows the finished query:

```
LET
  @MyList = NASD, SPX, NYSE

SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
  3: percent_move from today to 3 days later of @MyList

WHEN
  @MyList is up
  repeated for the previous 4 and current value
```

15. Select the **Report**  button from the toolbar to generate the answers. Notice how the report shows three separate results for each of the futures. The following shows a partial listing for each symbol in the report:

Let variable values:  
 @MyList=NASD


Date	Day	1	2	3
04/07/1971	Wed	0.2961	0.2961	0.7496
04/08/1971	Thu	0.0000	0.4521	0.4337
03/06/1972	Mon	-0.0391	0.4066	0.7585
12/08/1972	Fri	-0.2368	-0.6511	-1.1025
09/25/1973	Tue	0.7468	1.3388	1.2750
09/26/1973	Wed	0.5876	0.5243	0.3164
09/27/1973	Thu	-0.0629	-0.2696	0.4404

Let variable values:  
 @MyList=SPX

Date	Day	1	2	3
05/04/1928	Fri	0.8399	0.1482	0.0000
05/07/1928	Mon	-0.6859	-0.8329	-0.9799
07/02/1929	Tue	0.4277	0.4277	0.9266
07/03/1929	Wed	0.0000	0.4968	0.6742
08/01/1932	Mon	-3.9280	4.5826	6.7103
08/02/1954	Mon	-0.1936	-0.2904	-0.7099
09/17/1954	Fri	-0.4415	0.2523	0.9145

Let variable values:  
 @MyList=NYSE

Date	Day	1	2	3
04/06/1971	Tue	0.4285	0.5713	0.5713
04/07/1971	Wed	0.1422	0.1422	0.8533
04/08/1971	Thu	0.0000	0.7101	0.7811
03/06/1972	Mon	0.1322	0.2974	0.3139
03/07/1972	Tue	0.1650	0.1815	-0.3630
03/08/1972	Wed	0.0165	-0.5271	-1.4660
03/09/1972	Thu	-0.5435	-1.4822	-1.2022

16. Dismiss the report and select the **New**  button to clear the **Edit** pane for the next lesson.

## Problem Solvers

Create a query that looks at what happens in terms of percent move 1, 2, and 3 days later to the 2 year, 10 year and 30 year US Treasury Bond Futures when the wholesale inflation is higher than expected.



## CHAPTER 12

---

# Analysis using Intraday Data

## Synopsis

### Objectives

1. Introducing execution units.
2. Introducing IF-THEN-ELSE statements.
3. Using studies on intraday data.

### Market Brief

In the previous lessons you looked at the change of price in our security over some period of time. It might be interesting to look at the prices during the day to research when specific events occurred. The intraday data is provided in pricing bars. Price bars are a representation of the price at the open of a period, the close of that period and the high and low reached during the period. XMIM allows us to look at price bars for any period of time down to millisecond bars where intraday data exists for a series.



## Problem

For this lesson you will construct a query that uses the intraday data to indicate the exact minute the high occurred for the continuous S&P 500 Future contract for the most recent trading date. In the previous lessons, the conditions were checked on a daily basis throughout the history of the database (i.e., does 1/1/90 meet our condition? Does 1/2/90 meet our condition? Does 1/3/90? What about 1/4/90? etc.) and the attribute displayed for each day meeting the specified conditions (i.e., display the daily Closing Price for 1/1/90, and display the daily Closing Price for 1/2/90, etc.). The common time period to check the WHEN conditions and display the SHOW attribute was daily. In the XMIM language, the **Execution Units** (or global time units) were set for the previous lesson to the default or **1 day** setting.

In this exercise a query is being used to look closer at the data and research more about the intraday data on a particular date. You will modify the **Execution Units** to 1 minute in order to access the intraday values. Also an IF-THEN-ELSE statement will be used in the SHOW to mark where the high for the day occurred. After the query is completed, the following text will appear within the **Edit** pane of the **Query Builder** window:


```
SHOW
  MinuteHigh: High of SP
  Highest: highest from 08:30 am to 03:15 pm of High of SP
  Indicator: IF
                High of SP is exactly highest from 08:30 am to 03:15 pm of
                High of SP
                THEN 1
                ENDIF
WHEN
  Date is within 1 day
```

## Step-by-Step Solution

1. To begin, set the execution units to 1 minute. From the toolbar, select the **Execution Units**  button. Change **1 Day** to **1 Minute**. Select **OK** to close the **Execution Units** window.
2. The next step towards making the query is to create the SHOW statement `High of SP`. In the **Symbol** field type in `SP` (for the S&P 500 Future contract). For the **Column**, choose **High** from the pull-down menu. Select **OK** to add the SHOW statement to the **Edit** pane of the **Query Builder** window. Change the label in the **Edit** pane from `1: to MinuteHigh:`.
3. To create the next line in the SHOW statement enter `SP` in the **Symbol** field and for the **Column**, choose **High** from the pull-down menu. Select the **Studies** button from the SHOW statement pane then select **highest** from the list. The **Study: highest** window opens. Select the **Time Period** button then select the **From** button and from the pull-down menu select **Condition>Date Time Condition**. In the **Date Time Condition** window select the **Date or Time** button then select **Time is** from the pull-down menu. Keep **exactly** and enter the time `8:30` and select **am**. If the statement shows **Time is exactly 8:30 am** select **OK** to close the window and return to the **Time Period** window for the study.
4. Next, select the **To** button and from the pull-down menu select **Date Time Condition**. In the **Date Time Condition** window select the **Date or Time** button then select **Time is** from the pull-down menu. Keep **exactly** and enter the time `3:15` and select **pm**. If the statement shows **Time is exactly 3:15 pm** select **OK** to close the **Date Time** window and return to the **Time Period** window for the study. Select **OK** to close the **Time Period** window.
5. Select **OK** to close the **Study: highest** window and return to the **Query Builder**. Select the **Add Attribute to Query**  button to add the query statement to the **Edit** pane.
6. In the **Edit** pane of the **Query Builder** window, change the label `1: to Highest:`. The following shows the query progress:

```
SHOW
MinuteHigh: High of SP
Highest: highest from 08:30 am to 03:15 pm of High of SP
```


7. This step will show how to make an IF-THEN statement. In the **SHOW** pane of the **Query Builder** window enter `SP` in the **Symbol** field and choose **High** for the **Column**.




In the **SHOW** pane, select the **IF-THEN-ELSE**  button. In the **IF** portion of the **IF-THEN-ELSE** window select the **Condition** button and choose **Custom Event** from the pull-down menu. In the **Custom Event** window enter `SP` in the **Symbol** field and choose **High** from the **Column** pull-down menu. Select the **Continue** button.

In the **Conditional Operator** pane select the radial button for **is exactly** then select the **Continue** button.

In the **Right Attribute** pane type `SP` in the **Symbol** field and choose **High** from the **Column** pull-down menu. Select the **Studies** button and choose **highest** from the list. In the **Studies: highest** window select the **Time Period** button and select the radial button next to **From To**.


Select the **From** button and choose **Condition>Date Time Condition**. Select the **Date or Time** button and choose **Time is** from the list. Keep **exactly** and change the time setting to **8:30 am** then select the **OK** button.

Next, select the **To** button and choose **Condition>Date Time Condition**. Select the **Date or Time** button and choose **Time is** from the list. Keep **exactly** and change the time setting to **3:15 pm** then select the **OK** button. Close the **Time Period** window by selecting **OK**. Close the **Studies:highest** window by selecting **OK**. Notice that the **Studies**  button is now highlighted. Select **OK** to close the **Custom Event** window.


Next, in the **THEN** portion of the **IF-THEN-ELSE** window select the **THEN Attribute** button. Select the **Variable**  button and choose **Constant** from the list. Type **1** in the **Constant** field and select **OK**. Select **OK** to close the **IF-THEN-ELSE** window. Notice that the **IF-THEN-ELSE**  button is now highlighted to show that it has entries. Select the **Add Attribute to Query**  button to add the IF-THEN-ELSE statement to the query in the **Edit** pane.

- The last step is to set the **WHEN** date condition for the query. From the **WHEN** pane select the **Date Time Condition** button then select the **Date or Time** button and choose **Date is** from the list. Change **exactly** to **within** and make sure **1 Day** is selected. If the **Date Time Condition** window shows **Date is within 1 Day** select the **OK** button to close the window and add the date condition to the query in the **Edit** pane. The final query is as follows:

```
SHOW
MinuteHigh: High of SP
Highest: highest from 08:30 am to 03:15 pm of High of SP
Indicator: IF
           High of SP is exactly highest from 08:30 am to 03:15 pm of
           High of SP
           THEN 1
           ENDIF
WHEN
Date is within 1 day
```

- Select the **Report**  button to generate the answers for the query. Notice below that the **1.000** in the **Indicator** column shows when the exact time the high of the day was made. (The following is a portion of the report results.)

Date	Time	Day	MinuteHigh	Highest	Indicator
02/05/2007	01:57pm	Mon	1454.0000	1454.0000	1.0000

- Dismiss the report and select the **New**  button to clear the **Edit** pane for the next lesson.

## Language Lesson

This lesson examined the intraday minutely data. XMIM has a setting called execution units which determines the time-frequency over which queries will range through the database looking for answers. As mentioned, the default frequency is daily but may be changed to any frequency from one minute to any number of years. The execution units are set using the **Options>Execution Units** menu bar selection. Depending on availability of data (most securities in the database have daily prices but not all of these securities have intraday prices available), it is possible to create different time frequencies for the Symbol (that is, daily, weekly or monthly pricing bars). If intraday data exists for a series, it is possible to display frequencies of minutes, hours, days, week, months, quarters and years. Where no intraday data is available for a series, only frequencies greater than intraday may be used for the query (that is, daily, monthly, quarterly or yearly). The default time mechanism in XMIM is set to daily; however, a user may save their desired Execution Unit as the user default.

We also introduced how the IF-THEN-ELSE statement can be used to indicate when the High was made during the day. The general formula for an IF-THEN-ELSE statement is `IF condition is true THEN x ELSE y`. For the XMIM specifically, this can be translated to `IF condition THEN Attribute A ELSE Attribute B`. This query did not specify an ELSE statement as it is not necessary for every IF-THEN-ELSE statement. We used the `THEN 1` as a visual indicator of the high of the day and if we had included `ELSE 0` in our statement the 1 would not be as easy to spot. By leaving off the ELSE statement, a `NaN` is returned if the condition is not true, making a 1 easier to see.

IF-THEN-ELSE statements can also be used to chain two histories together. For instance, if one time series stops and another one starts, these can be linked together with the following syntax:

```
IF Column of SYMBOLA is defined THEN Column of SYMBOLA ELSE Column of SYMBOLB
```

Another use of IF-THEN-ELSE statements is to show a value when a condition has occurred. For instance if you want to show the settlement price of a futures contract on its expiration day, the following syntax could be used.

```
IF Date is SP expiration_day THEN Close of SP
```

## Problem Solvers

Construct a query that uses the intraday data to indicate the exact minute the low occurred for the continuous S&P 500 Future contract for the most recent trading date.

## CHAPTER 13

---

# Event-Driven Analysis using Intraday Data

## Synopsis

### Objectives

1. Reiterating time offset.
2. Introducing attribute units.
3. Using a time condition.

### Market Brief





When a stock or other trading instrument has a higher open price than the price that it closed at on the previous day this is referred to as a gap. This can be a considerable move up or down in price with no trades occurring between the official close and open of the market. Market events such as important meeting dates, economic report releases, or earnings announcements, can cause these gaps to occur.

## Problem


In this lesson we are going to analyze what happens to the S&P 500 Index in the first hour of trading when a gap has occurred and the open is more than the previous day's close by more than \$1. While on the same day, an FOMC meeting occurred. You will use a percent move study to see how the index performed from 8:30 am, at the open to 9:30 am, the end of the first trading hour. Other percent move studies will also show how the index performed the remainder of the day, from 9:30 am to 3:15 pm, and for the entire day as a whole from 8:30 am to 3:15 pm. After the query is completed, the following text will appear within the **Edit** pane of the **Query Builder** window:

```
SHOW
  FirstHr: percent_move from 08:30 am to 09:30 am of Close of SPX
  RestofDay: percent_move from 09:30 am to 03:15 pm of Close of SPX
  DailyMv: percent_move from 08:30 am to 03:15 pm of Close of SPX
WHEN
  Time is 09:30 am
AND
  Date is in "USA_FOMC_Rate_Meeting"
AND
  The daily open of SPX - The daily Close of SPX 1 day ago is more than 1
```


## Step-by-Step Solution

1. From the toolbar, select the **Execution Units**  button and choose **Minutes** from the pull-down menu.
2. Type the symbol name **SPX** into the **Symbol** field or select the **Search Database**  button and open the folders in the **Tree View** to locate the symbol (open the folders for: **Indices>U.S.Indices**). Keep the default **Close** as the column.
3. Select the **Studies**  button and choose **% move** from the list. In the **Study: % move** window select the **Time Period** button. In the **Time Period** window select the radial button next to **From** and select the **From** button. Choose **Condition>Date and Time Condition** from the pull-down menu. Select the **Date or Time** button then choose **Time is** from the list. Keep the **exactly** button default and change the time to **8:30 am**. Select **OK** to close the **Date Time** window. Next, select the **To** button and choose **Condition>Date and Time Condition** from the pull-down menu. Select the **Date or Time** button then choose **Time is** from the list. Keep the **exactly** button default and change the time to **9:30 am**. Select **OK** to close the **Date Time** window. Select **OK** to close the **Studies:% move** window. Select the **Add Attribute to Query**  button in the **Query Builder** to add the query statement to the **Edit** pane.
4. In the **Edit** pane change the label 1: to **FirstHr:**.
5. Repeat the steps above with the appropriate times to complete the next two next query statements so that your query matches the following:

```
SHOW
  FirstHr: percent_move from 08:30 am to 09:30 am of Close of SPX
  RestofDay: percent_move from 09:30 am to 03:15 pm of Close of SPX
  DailyMv: percent_move from 08:30 am to 03:15 pm of Close of SPX
```

6. Now, setup the time condition **Time is 09:30 am**. From the **WHEN** pane, select the **Date Time Condition** button then select the **Date or Time** button. Choose **Time is** from the list. Keep the **exactly** setting then enter **9:30 am**.
7. To enter another date condition, select the **Add Condition**  button.



The **Refresh Condition**  button will refresh the **Date Time** window so that a new date or time condition can be constructed.

8. Next, select the **Date or Time** button then choose **Date is** from the list. Select the **within** button and choose **in file>server file**. Select the **Browse** button and open the folders for **Monetary>United States>FOMC** and choose **USA\_FOMC\_Rate\_Meeting** from the list. Select **OK** to close the window. Select **OK** to close the **Date Time Condition** window.




The following shows the query:

```
SHOW
  FirstHr: percent_move from 08:30 am to 09:30 am of Close of SPX
  RestofDay: percent_move from 09:30 am to 03:15 pm of Close of SPX
  DailyMv: percent_move from 08:30 am to 03:15 pm of Close of SPX
```

```

WHEN
  Time is 09:30 am
AND
  Date is in "USA_FOMC_Rate_Meeting"


```

9. From the **WHEN** pane, select the **Custom Event** button. For the **Left Attribute**, type `SPX` in the **Symbol** field and choose **Open** from the **Column** field. Select the **Attribute Units**  button from the **SHOW** pane and choose **Day** from the pull-down menu.
10. Select the **Arithmetic Operator** button and choose the radial button for **Subtract**. Type `SPX` in the **Symbol** field and choose **Close** from the **Column** field. Select the **Attribute Units**  button from the **SHOW** pane and choose **Day** from the pull-down menu. Select the **Time Offset**  button and keep the **1 Day Ago** default. Select **OK** and notice that the **Time Offset** button is now highlighted to show that a selection was made. Select the **Continue** button.
11. In the **Conditional Operator** pane, select the radial button next to **is exactly** and change **exactly** to **more than** then select the **Continue** button. In the **Right Attribute** pane select the **Variable** button and choose **Constant** from the pull-down menu. Type `1` in the **Constant** field. Select **OK** to close the window and add the query statement to the **Edit** pane. The following shows the completed query:


```

SHOW
  FirstHr: percent_move from 08:30 am to 09:30 am of Close of SPX
  RestofDay: percent_move from 09:30 am to 03:15 pm of Close of SPX
  DailyMv: percent_move from 08:30 am to 03:15 pm of Close of SPX
WHEN
  Time is 09:30 am
AND
  Date is in "USA_FOMC_Rate_Meeting"
AND
  The daily open of SPX - The daily Close of SPX 1 day ago is more than 1

```

12. Dismiss the report and select the **New**  button to clear the **Edit** pane for the next lesson.

## Language Lesson

In this lesson, you used attribute units to force XMIM to observe data in a different unit than what the execution units were set to. You used attribute units to compare the daily open of SPX to the daily close of SPX. Generally, attribute units are used as the default time frequency for any attribute expressions built in XMIM. Time frequency can also be set for each defined attribute (local settings) using the **Attribute Units**  button located in the **SHOW** pane of the **Query Builder** window. The difference between the **Attribute Units** located under **Options>Attribute Units** in the menu bar and the **Attribute Units** located in the **SHOW** pane, is the version selected in the **SHOW** pane is specific to that one attribute and will override the **Option>Attribute Units** menu version. **Attribute Units** accessible from **Options>Attribute Units** in the menu bar will change the frequency of all attributes used either in **SHOW** attributes or within **WHEN** conditions custom events. This query used a time offset to compare a price on our event date to a price on the day before. You used time offset to compare the daily open of SPX on the event date to the daily close of SPX on the day before the event date. The **Time Offset** menu selection is used to pick a date, relative to 'today' or the current date or time executed within the system. The simplest time offset takes the form of *n* time-units [ago | later], such as "10 days ago" or "55 weeks later". Time offset is commonly used to anchor a time period against the current execution date or time in XMIM.

## Problem Solvers

Create a query that studies the move in the first hour of the day for the 30 year US Treasury Bond Future when The Bureau of Labor Statistics releases the Producer Price Index (PPI) within the last 10 years.



The PPI report comes out at 8:30 am EST but the time stamp on the data for US is CST since the exchange it's traded on is in Chicago.

## CHAPTER 14

# Back-Testing a Long-Only Moving Average Trading Strategy

## Synopsis

### Objectives

1. Introducing ORDER blocks.
2. Reiterating time offset.
3. Introducing ORDER options.

### Market Brief

Prior to taking a position using an untried trading strategy most traders usually paper trade the strategy in order to identify whether or not the strategy is appropriate. The trader documents the entry price, monitors the trade, documents the price where the position closed out (that is, level where the stop loss, take profit or position close would trigger) and evaluates the strategy following several iterations of this process. The evaluation would take into account the overall profitability of the strategy, the maximum amount of draw down, average length of time the position kept the trader in the market, etc. Obviously the longer period of time the trader is able to *paper trade* the position the more information he or she would have about the strategy. XMIM has the ability to enhance the paper trade process by allowing researchers to evaluate systematic trading strategies over a long period of time.

At the beginning of this manual we explained that there are two major types of questions or queries that may be posed in the software. Up to this point you have spent a substantial amount of time using the SHOW/WHEN query. The SHOW/WHEN query provides quite a bit of utility and will be used for most of your research ideas. The other type of query, the ORDER query, is a very powerful research tool and will build onto your research ideas created by using the SHOW/WHEN query by back-testing your research strategies. The ORDER query allows you the ability to buy or sell your security when certain conditions exist and to exit out of your position when certain other conditions are present.

## Problem

You are going to build a very simple long-only moving average system. This system will place a buy order for 10 front S&P futures contracts anytime the closing price of the contract crosses above the 1-month average of closing prices for that contract and will exit out of the position anytime the closing price crosses below the 1-month average. Because you are using a continuous futures contract series (which does not really exist) you will need to roll your contracts. This means if you have a signal to buy 10 contracts and have not hit your exit condition you will sell out of the contract at expiration and buy the new front contract. The following shows how the completed query will look:

```
1: ORDER
  1.1: Buy 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses above 1 month average of Close of SP
EXIT
  Close of SP crosses below 1 month average of Close of SP
```

## Step-by-Step Solution

### Working Within an ORDER Block

1. You will need to work within an ORDER block instead of a SHOW/WHEN. In the **Query Builder** window, select **Tools>Add Query Block>ORDER** from the menu bar.
2. Notice that the **Query Builder** window now includes an **ORDER** pane and **EXIT** pane in addition to the WHEN condition that you have used before.

### Creating the Buy ORDER

1. In the **ORDER** pane, in the **Trade** pane, select **Buy** from the pull-down menu.
2. Enter 10 in the text field next to **Contracts** and type the symbol **SP** into the next text field. Before you exit the window, you need to offset the date on which you will purchase your contracts. You might expect XMIM to execute this query's buy orders on the day after the condition is met because in the real world it is impossible to simultaneously calculate the closing price of a security and place an order for that security right at the close. Obviously, the simultaneous calculation and order placement would be impossible in the real world but would occur using XMIM. In order to place the order on the next day, you must use the time offset function. Select the **Time Offset** button.

The screenshot shows the 'Order' dialog box with the following details:

- Block Label:** 1
- Trade Label:** 1.2
- Trade:** Buy (dropdown), 10 (input), Contracts (dropdown), of SP (input), Add To Group (button)
- Entry Options:** Entry Stop Value (input), Entry Limit Value (input)
- Exit Options:** Exit Loss Value (input), Exit Loss Trail (input), Exit Profit Value (input), Exit Profit Trail (input)
- Order Options:** Commission (input), Slippage (input), Order Active (Time Period button), Good Till Cancelled (checkbox)
- Enter/Exit:** Enter on the (dropdown), Exit on the (dropdown), Time Offset (button)

3. Change the time offset settings to **1 Day Later** and select the **OK** button.

The 'Time Offset' dialog box shows the following configuration:

- Field 1: 1
- Field 2: Day
- Field 3: Later
- Previous: 1
- Buttons: OK, Cancel, Undo

4. Next, you want to make sure that the order will be entered on the open of the day following the condition. In the **Enter/Exit** pane, select **Open** from the **Enter on the** pull-down list.

The 'Order' dialog box now shows the 'Enter/Exit' section updated:

- Enter on the:** Open (dropdown)
- Exit on the:** (dropdown)
- Time Offset:** (button)

5. If your **Buy Trade** pane has **10 Contracts, SP, 1 Day Later** and **Enter on the Open** highlighted, select the **Enter** button to accept these selections.


## Setting the Entry Condition

1. The **WHEN** pane is used to establish the entry condition for an ORDER. You will buy 10 contracts anytime the closing price of contract crosses above the one-month average of the closing prices for the contract. This condition is created using a custom event condition. This custom event condition will require the completion of a left attribute (Close of SP), a conditional operator (crosses above) and a right attribute (one month average of Close of SP). In the **WHEN** pane select **Condition** and then choose **Custom Event** from the pull-down menu.
2. In the **Custom Event** window in the **Left Attribute** pane type in **SP** in the **Symbol** field and choose **Close** from the **Column** pull-down menu. If the **Left Attribute** pane has **SP** and **Close** highlighted, select the **Continue** button.
3. Within the **Conditional Operator** pane select **crosses above** and then select the **Continue** button.
4. In the **Right Attribute** pane, type **SP** in the **Symbol** field and choose **Close** as your **Column**. Select the **Studies**  button and choose **average** from the list. In the **Study: average** window select the **Time Period** button. In the **Time Period** window, change **1 Day** to **1 Month** and select **OK** to close the **Time Period** window. The **Studies**  button is highlighted to show that a selection was completed. Select **OK** to complete and close the **Custom Event** window.

## Setting the Exit Condition

1. Our exit condition is going to be the same as our entry or WHEN condition except that, instead of selecting **crosses above**, you will choose **crosses below** for your conditional operator. In the **Exit** pane select the **Condition** button then choose **Custom Event** from the pull-down menu.
2. In the **Left Attribute** pane, type **SP** in the **Symbol** field and choose **Close** for the **Column** then select the **Continue** button.
3. In the **Conditional Operator** pane, select the radio button for **crosses below** then select the **Continue** button.
4. In the **Right Attribute** pane, type **SP** in the **Symbol** field and choose **Close** for the **Column**. Select the **Studies**  button and choose **average** from the list. In the **Study: average** window select the **Time Period** button and change **1 Day** to **1 Month** and select **OK** to close the **Time Period** window. The **Studies**  button is highlighted to show that a selection was completed. Select **OK** to complete and close the **Custom Event** window.

## Setting the Rollover Policy


1. The query should now resemble the example illustrated in the problem above. You cannot execute your query, however, because you haven't dealt with making sure that our futures contract will roll upon expiration. In the real world you would have to sell out of the front contract upon expiration and buy the back contract in order to stay in the trade. You can simulate this by changing the Entry & Exit ORDER options. From the toolbar, select the **Execute Options**  button then select the **ORDER** tab. In the **Entry & Exit** pane for **Rollover** select **Re-entry Number of Contracts** from the pull-down menu.
2. Another ORDER option that is helpful to use is **Print Reason for Trade** located in the **Report Details** pane of the **Execute Options (ORDER tab)** window. Select the check box to activate the **Print Reason for Trade** option then select **OK** to close the window.
3. From the toolbar, select the **Report** button to execute the ORDER query. Notice that the statistical information on your trading activity appears at the top of the report with all of the transactions appearing on the lower portion of the report.

P&L Summary Statistics		
Statistic	Combined	
Number of Trades	438.00	
Number of Closed Trades	437.00	
Number of Winning Trades	122.00	
Percentage of Winning Trades	27.92	
Max Consecutive Winning Trades	5.00	
Avg Consecutive Winning Trades	1.37	
Percentage of Trades at New High	2.29	
Number of Losing Trades	315.00	
Percentage of Losing Trades	72.08	
Max Consecutive Losing Trades	19.00	
Avg Consecutive Losing Trades	3.50	
Percentage of Trades at New Low	10.76	
Average Trade Length	8.55	
Average Winning Trade Length	18.72	
Average Losing Trade Length	4.58	
Total Number of Contracts	4380.00	
Maximum Number of Contracts	20.00	09/16/1982
Average Profit per Trade	-309.38	
Average Profit per Winning Trade	48932.18	
Average Profit per Losing Trade	19380.71	
Ratio Average	2.52	
Profit Factor	0.98	
Pessimistic Return	0.84	
Performance Ratio	-0.01	
Average Profit per Period	0.37	
Compound Average Profit per Period	-0.00	
Percentage of Periods at New High	6.06	
Standard Deviation of Profit Return	2.20	
Sharpe Ratio (est.)	0.17	
ZStat	2.88	
Standard Error	144.83	
Standard Error Ratio	0.00	
Geometric Error Ratio	0.02	
Biggest Win	294499.97	06/19/1997
Biggest Loss	-147249.76	03/23/1999

4. There are several other key functions that can be used in your ORDER query. These functions include setting your stop loss and take profits for the trade. These concepts and others are more appropriate for intermediate training courses. For more information, see the [\*XMIM Profit/Loss User Manual\*](#).

## Language Lesson

In this lesson you pulled together several of the analytical functions you worked on in earlier lessons. In addition to the technical studies used in the query, the lesson introduced the basic **Buy Trade** window and the rollover options.

There are several very useful options available to enhance your ORDER query accessible from the **Execute Options** menu (to access the menu, select the **Execute Options**  button from the toolbar). For example, there are options that will allow for slippage and commission for each trade.

## Problem Solvers

Create a profit-loss study, that begins after 1995, to purchase 2000 shares of Dell Computer stock anytime the closing price crosses above the 1-week average of the closing price and exit upon a reverse signal.

## CHAPTER 15

---

# Back-Testing Long and Short Moving Average Trading Strategies

## Synopsis

### Objectives

1. Introduction to multiple ORDER blocks.
2. Reiteration of the **ORDER** window.

### Market Brief

A popular strategy used with momentum based trading systems is to close out an open position and initiate a reverse order upon a reverse signal. Typically, the reverse signal is the exit condition of the original trade.

XMIM has the ability to create multiple query blocks. You may create a compound query block by simply adding a new query block to your existing query.

## Problem

You are going to build onto the query created in the preceding lesson by adding an additional query block to trigger a short position or a sell trade whenever the exit conditions of your buy trade are activated. This system will place a buy order for 10 front S&P futures contracts anytime the closing price of your contract crosses above the 1 month average of closing prices for that contract and will exit out of the position anytime the closing price crosses below the 1 month average. Additionally, the system will place a sell order for 10 front S&P futures contracts anytime the closing price of the contract crosses below the 1 month average of closing prices for that contract and will exit out of the position anytime the closing price crosses above the 1-month average. The following shows how the query will look when completed:

```
1: ORDER
  1.1: Buy 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses above 1 month average of Close of SP
EXIT
  Close of SP crosses below 1 month average of Close of SP

2: ORDER
  2.1: Sell 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses below 1 month average of Close of SP
EXIT
  Close of SP crosses above 1 month average of Close of SP
```

## Step-by-Step Solution

### Adding an Additional ORDER Query

1. In the **Query Builder** window, from the menu bar, select **Tools>Add Query Block>ORDER**. Notice that a second ORDER block appears within the **Edit** pane.

```

1: ORDER
  1.1: Buy 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses above 1 month average of Close of SP
EXIT
  Close of SP crosses below 1 month average of Close of SP

2: ORDER
    
```

2. In the **Trade** pane, select **Sell** from the pull-down menu.
3. Next, enter 10 next to the **Contracts** field and type the symbol **SP** into the **Symbol** text field. Before you exit the window, offset the date when the contracts will be sold. Select the **Time Offset** button and change the settings to **1 Day Later** and select **OK**. Next, select **Open** from the **Enter on the** pull-down located in the **Entry/Exit** pane to ensure that the trade will be activated on the morning after the conditions are met. If the **Trade** pane has **Sell, 10 Contracts, SP, 1 Day Later** and **Enter on the Open** listed, select the **Enter** button to accept these selections.

The following shows your query progress:



```

1: ORDER
  1.1: Buy 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses above 1 month average of Close of SP
EXIT
  Close of SP crosses below 1 month average of Close of SP

2: ORDER
  2.1: Sell 1 day later  10 contracts of SP
      Enter on the open
    
```



### Setting Entry Conditions

1. In the previous lesson, it was mentioned that the **WHEN** pane for an ORDER block is used to establish the entry condition for our ORDER. In this lesson, you will sell 10 contracts anytime the closing price for the front S&P futures contract crosses below the 1-month average of the closing prices for the contract. From the **WHEN** pane select the **Condition** button then select **Custom Event** from the pull-down

menu. In the **Left Attribute** pane, type **SP** in the **Symbol** field and choose **Close** from the **Column** field. Select the **Studies**  button and choose **average** from the list. In the **Study: average** window change **1 Day** to **1 Month** and select the **OK** button to close the window. Notice that the **Studies**  button is highlighted to show that an entry was made. Select the **Continue** button to proceed to the **Conditional Operator** pane.

2. Within the **Conditional Operator** pane select the radio button for **crosses above** and select **crosses below** from the pull-down menu. Select the **Continue** button to proceed to the **Right Attribute** pane.
3. In the **Right Attribute** pane, type **SP** in the **Symbol** field and choose **Close** as the **Column**. Select the **OK** button to enter the selections into the **Edit** pane and return to the **Query Builder** window.

## Setting Exit Conditions

1. The exit condition is going to be the same as our entry condition except that, instead of selecting **crosses below**, you will choose **crosses above** for your conditional operator. In the **Exit** pane select the **Condition** button and choose **Custom Event** from the pull-down menu.
2. In the **Left Attribute** pane, type **SP** in the **Symbol** field and choose **Close** for the **Column** then select the **Continue** button.
3. In the **Conditional Operator** pane, select the radio button for **crosses above** and select the **Continue** button.
4. In the **Right Attribute** pane, type **SP** in the **Symbol** field and choose **Close** for the **Column**. Select the **Studies**  button and choose **average** from the list. In the **Studies: average** window, select **1 month** and select the **OK** button to close the window. Notice that the **Studies**  button is highlighted to show that you have made an entry. Select the **OK** button to add the entries to the **Edit** pane and return to the **Query Builder** window.
5. The rollover options have not been reset, so go ahead and execute the query by selecting the **Report** button from the toolbar. The execution time for the query will dramatically increase because of the addition of the new query block.

**Report**

P&L Summary Statistics

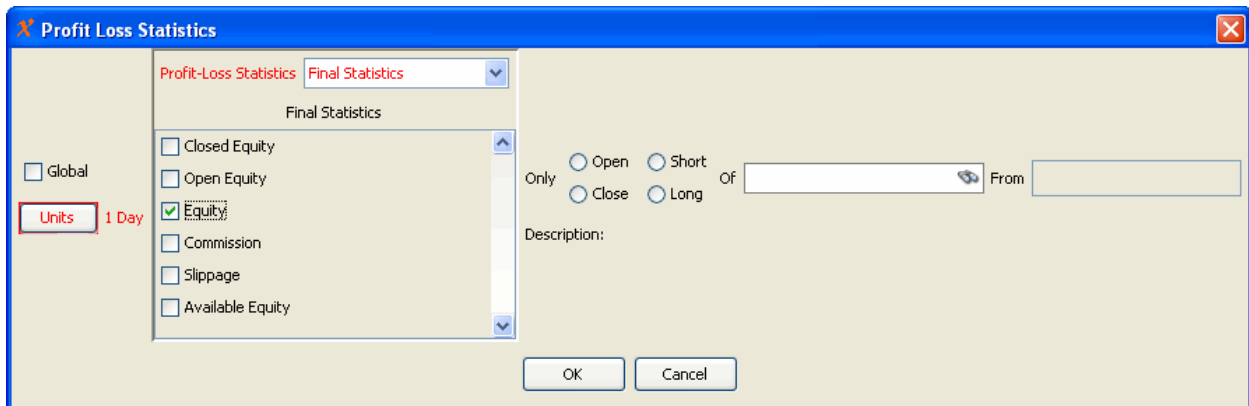
Statistic	Combined		Long	
Number of Trades	843.00		438.00	
Number of Closed Trades	842.00		437.00	
Number of Winning Trades	208.00		122.00	
Percentage of Winning Trades	24.70		27.92	
Max Consecutive Winning Trades	4.00		5.00	
Avg Consecutive Winning Trades	1.32		1.37	
Percentage of Trades at New High	0.36		2.29	
Number of Losing Trades	634.00		315.00	
Percentage of Losing Trades	75.30		72.08	
Max Consecutive Losing Trades	15.00		19.00	
Avg Consecutive Losing Trades	3.99		3.50	
Percentage of Trades at New Low	23.40		10.76	
Average Trade Length	7.55		8.55	
Average Winning Trade Length	16.87		18.72	
Average Losing Trade Length	4.47		4.58	
Total Number of Contracts	8430.00		4380.00	
Maximum Number of Contracts	20.00	06/17/1982	20.00	09/16
Average Profit per Trade	-2461.39		-309.38	
Average Profit per Winning Trade	47964.79		48932.18	
Average Profit per Losing Trade	19005.00		19380.71	
Ratio Average	2.52		2.52	
Profit Factor	0.83		0.98	
Pessimistic Return	0.74		0.84	
Performance Ratio	-0.05		-0.01	
Average Profit per Period	0.46		0.38	
Compound Average Profit per Period	-0.00		-0.00	
Percentage of Periods at New High	2.01		6.25	
Standard Deviation of Profit Return	2.08		2.24	

Dismiss    Print    Save    Paste To Excel

## Language Lesson

This lesson focused on creating compound query blocks. Another interesting query block to add on to this lesson would be a SHOW/WHEN query so that you could graph the cumulative equity curve of this trading system. From the menu bar, select **Tools>Add Query Block>SHOW WHEN**. From the **SHOW** pane select the **Profit Loss** button to add final statistics to the query.

From the **Profit Loss Statistics** window, select **Final Statistics** from the **Profit-Loss Statistics** pull-down menu then check the box for **Equity**. Select the **OK** button to close the window. Notice that the **Profit Loss** button is highlighted to show that an entry was made. Select the **OK** button to add the entry to the query in the **Edit** pane.



After the query is completed with the SHOW/WHEN statement, the query will match the following:

```

1: ORDER
  1.1: Buy 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses above 1 month average of Close of SP
EXIT
  Close of SP crosses below 1 month average of Close of SP
2: ORDER
  2.1: Sell 1 day later  10 contracts of SP
      Enter on the open
WHEN
  Close of SP crosses below 1 month average of Close of SP
EXIT
  Close of SP crosses above 1 month average of Close of SP

SHOW
  1: equity
    
```

As you probably guessed it is possible to add an infinite number of query blocks to the research study. A common XMIM research technique is to create an advanced allocation process whereby new ORDER blocks representing unique trading strategies will be added to create a smoothed equity curve.

## Problem Solvers

Create the same profit loss study as above but substitute the Gold futures contract.



## CHAPTER 16

---

# Using "My Queries" to Store Frequently Used Queries

## Synopsis

### Objectives

1. Create a **My Queries** button.
2. Learn about the **Templates** button.

### Market Brief


Many queries are useful to run on a daily or frequent basis. The Best Match Analog is a query that is quite useful in comparing the recent trading pattern of a symbol and finding a historical period in time that is highly correlated to what is occurring now. When XMIM is installed, this particular query is provided under the **My Queries** pane for your convenience. Once a query button is created under the **My Queries** pane the user can select the button for the query and the graph or report for the query will generate depending on which one you designated to generate. There is no need to locate and open the query file and then run the graph or report on the query. This area makes retrieving and running the results on your favorite queries quite simple.

## Problem



In this lesson, you will save the following query under the **My Queries** pane. This query shows the Close of the Dow Jones Industrial Average index and the 65 day average over the last 3 months.

```
SHOW
  DJIA: Close of DJIA
  65DyAvg: 65 value average of Close of DJIA
WHEN
  Date is within 3 months
```

## Step-by-Step Solution

1. In the **SHOW** pane of the **Query Builder** window type **DJIA** into the **Symbol** field and choose **Close** from the **Column** pull-down menu. Select the **Add Attribute to Query**  button to add the query statement **Close of DJIA** to the **Edit** pane. Edit the query in the **Edit** pane and change the label **1:** to **DJIA:**. The following shows the query progress:

```
SHOW
DJIA: Close of DJIA
```

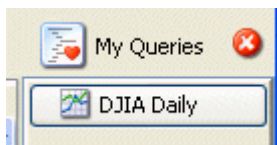
2. Next, type **DJIA** into the **Symbol** field and choose **Close** from the **Column** pull-down menu. Select the **Studies**  button and choose **average** from the list.
3. In the **Study: average** window select the **Time Period** button. Change the selection from **200 Days** to **65 Values**. Select the **OK** button to close the **Study: average** window. Select the **Add Attribute to Query**  button to add the query statement **65 value average of Close of DJIA** to the **Edit** pane. Edit the query in the **Edit** pane and change the label **1:** to **65DyAvg:**. The following shows the query progress:

```
SHOW
DJIA: Close of DJIA
65DyAvg: 65 value average of Close of DJIA
```

4. For the **WHEN** condition select the **Date Time Condition** button then select the **Date or Time** button and select **Date is**. Change the time to **3** and the **Day** to **Month** so that the statement is **Date is within 3 Month**. Select the **OK** button to close the **Date Time Condition** window and add the **WHEN** condition to the query in the **Edit** pane. The following shows the query progress:


```
SHOW
DJIA: Close of DJIA
65DyAvg: 65 value average of Close of DJIA
WHEN
Date is within 3 months
```

5. Next, select **Tools>My Queries>Add Current Query** from the menu bar. The **Add Current Query** window opens. In the **Query Name** pane type **DJIA Daily** for the query name. Ensure that the radial button for **Graph** is selected in the **Action Event** pane. Select the **Save** button and note that there is a new button entry under **My Queries** called **DJIA Daily**.



When selecting this button in the future the graph will run automatically.

## Language Lesson

The Best Match analog query that was mentioned in the "Market Brief" section can be edited two ways. You can right-click on the button in the **My Queries** pane and select **View Query** to make manual edits in the query window. However, this is a complex query and manual editing requires a good understanding of the query. The preferred alternative is to use the **Templates**  button on the toolbar. The **Templates** feature provides an easy way to customize the Best Match analog and the Threshold analog. You can also run the customized analogs from this location eliminating the need to open the analog in the query window at all.

## Problem Solvers

Save the query below in the **My Queries** pane as "SPX Daily".

```
SHOW
  SPX: Close of SPX
  65DyAvg: 65 value average of Close of SPX
WHEN
  Date is within 3 months
```

When completed, select the **SPX Daily** button to run this query as a graph.



## CHAPTER 17

---

# Bringing Data into Excel from XMIM

## Synopsis

### Objectives

1. Bringing your results into an Excel spreadsheet.
2. Setting options for copying/pasting into Excel.

### Market Brief

It is easy to share analysis between XMIM and popularly used programs such as Microsoft Excel<sup>®</sup>. Just select the **Paste to Excel** button located at the bottom of your **Report** window to copy your query results into an Excel spreadsheet for further analysis. In addition, there are option settings in the **User Preferences** menu that control how the results are brought into Excel. This lesson steps you through the process of bringing results into Excel and shows how to change the Excel option settings.

## Problem


In this lesson, you are going to copy the results of a query into Microsoft Excel. Specifically, an XMIM report containing the last month of closing prices for the front continuous S&P futures contract will be copied and then pasted into an Excel spreadsheet. Before you get started working the steps for the solution, take a look at the section below on the "Excel Option Settings".

## Excel Option Settings

There are three Excel option settings in the **User Preferences** menu. To access the **User Preferences** menu, select **Options>User Preferences** from the menu bar.

### Excel Pane


For these options, Excel must be running with a workbook open to receive the data from the application. The following describes the three Excel options:

Option	Function
Copy Table Results to Clipboard	This option allows the user to put the Report results in another application. This option is checked (activated) by default.
Send Paste Command to Excel	This option will paste the results of a Report into an open Excel worksheet.
Send New Worksheet and Paste Command to Excel	<div style="display: flex; align-items: center;">  <p>With only the <b>Send Paste Command to Excel</b> selected it is possible to overwrite content on the opened Excel worksheet. To prevent this, check the <b>Send New Worksheet and Paste Command to Excel</b> option.</p> </div>
	Creates a new worksheet in Excel and pastes the results of a Report into the new worksheet.

## Step-by-Step Solution

1. Create a SHOW/WHEN query that will SHOW the closing price for the continuous S&P futures contract (close of SP) WHEN the date is within the last month. After you have completed the query, the following text will appear within the **Edit** pane of the **Query Builder** window:

```
SHOW
  1: Close of SP
WHEN
  Date is within 1 month
```

2. Execute an XMIM report by selecting the **Report**  button from the toolbar.
3. To copy and paste the report in Excel open the Excel program and select **Ctrl+V** from the keyboard or **Edit>Paste** to paste the selection.



In XMIM, if the **Copy Table Results to Clipboard** option is unchecked the report results can still be pasted into an Excel spreadsheet by selecting the **Paste to Excel** button located at the bottom of the **Report** window.

## Problem Solvers

Populate an Excel spreadsheet with the last 2 months of closing prices for the closing level of the Dow Jones Industrial Average Index.



## CHAPTER 18

# Problem Solver Answers

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The following lists the answers to the problem solver questions for each chapter.

## Problem Solver, Chapter 3: Event Driven Analysis using the Query Wizard Market Events

### Question

Create a query using the **Query Wizard** that shows what happens to the 30-year US Treasury Bond future contract 1 week and 2 weeks later when the close price is up extra big and the day before it made a new 52-week low.

### Answer

```
SHOW
  t+1: percent_move from today to 1 week later of US
  t+2: percent_move from today to 2 weeks later of US
WHEN
  1 day ago
  low of US is less than 52 week lowest of low of US 1 value ago
AND
  1 value percent_move of US is more than
  (30 day average of 1 value percent_move of US +
  (3 * 30 day std_dev of 1 value percent_move of US
  )
  )
```

## Problem Solver, Chapter 4: Event Driven Analysis using the Query Wizard Date Events

### Question

Create a query using the **Query Wizard** that shows what happens to the NASDAQ index each day over the next 3 days when the FOMC has a meeting.

### Answer

```
SHOW
  t+1: percent_move from today to 1 day later of NASD
  t+2: percent_move from today to 2 days later of NASD
  t+3: percent_move from today to 3 days later of NASD
WHEN
  Date is in "USA_FOMC_Rate_Meeting"
```

## Problem Solver, Chapter 5: Basic Pricing Graphs

### Questions

1. Construct a query that will graph the closing yield for the U.S. 10-year Treasury Bond.
2. Construct a query that will graph the opening price for the U.S. 30-year Treasury Bond futures contract.

### Answers

1. 

```
SHOW  
1: Close of USC10
```
2. 

```
SHOW  
1: Open of front US
```

## Problem Solver, Chapter 6: Limiting the Graph to a Relevant Period of Time

### Questions

1. Construct a query to graph the bar and range of Dell Computer Corporation stock for the last 2 years.
2. Construct a query to graph the bar of the front S&P futures contract as well as the daily range for the last 52 weeks.



Look for your symbol in the **Search Database**, **Tree View** menu, under **Futures > MktIndices > USA\_Equities**.

### Answers

1. 

```
SHOW
  1: BAR of DELL
  2: range of DELL
WHEN
  Date is within 2 years
```
2. 

```
SHOW
  1: BAR of front SP
  2: range of front SP
WHEN
  Date is within 52 weeks
```

## Problem Solver, Chapter 7: Using a Technical Indicator with a Price Graph

### Questions

Create a 2-week correlation study of the close of the Dow Jones Industrial Average Index (DJIA) and NASDAQ Composite Share Index (NASD) for the last 6 months.



In the **Search Database**, **Tree View** menu, look under **Indices > U.S.Indices** for both symbols.

### Answers

```
SHOW
  1: 2 week correlation of Close of DJIA and Close of NASD
WHEN
  Date is within 6 months
```

## Problem Solver, Chapter 8: Basic Event Driven Analysis using Date Conditions

### Questions

1. Create a study that analyzes the 1-day percent move of the 30-year U.S. Treasury Bond futures contract following all a Nonfarm economic release falling after 1993.
2. Create a study that analyzes the 1-week move of the front S&P futures contract leading up to all U.S. holidays.

### Answers

1. 

```
SHOW
  1: percent_move from today to 1 day later of front US
WHEN
  Date is in "nonfarm.rpt"
  AND
  Date is after 1993
```
2. 

```
SHOW
  1: move from 1 week ago to today of front SP
WHEN
  Date is any holiday
```

## Problem Solver, Chapter 9: Basic Event Driven Analysis using Market Conditions

### Questions

1. Create a study that analyzes the 1-day move of the Euro dollar, following all Producer Price Index release dates falling after 1995 whenever the actual Producer Price Index release is less than the consensus estimate.
2. Create a study that analyzes the 1-week move of the 30-year U.S. Treasury Bond following all Home Sales release dates within the last 3 years whenever the actual Home Sales release is less than the consensus estimate.

### Answers

1. 

```
SHOW
  1: move from today to 1 day later  of Close of EURUSD
WHEN
  Date is in "ppi.rpt"
  AND
  Date is after 1995
  AND
  PPI_ACT is less than PPI_EST
```
2. 

```
SHOW
  1: move from today to 1 week later  of front US
WHEN
  Date is in "homesale.rpt"
  AND
  HOMESALE_ACT is less than HOMESALE_EST
  AND
  Date is within 3 years
```

## Problem Solver, Chapter 10: Event-Driven Analysis using Weather Data

### Question

For any date in December, January or February following 1990 where the low temperature at the New York LaGuardia Airport, is down over 20% for two days in a row, show the move from this date (today) to 3 days later of the front Natural Gas contract (NG).

### Answer

```
SHOW
  1: move from today to 3 days later  of front NG
WHEN
  Date is after 1990
AND
  LowTemp of NEW.YORK.LA.GUARDIA.NY is down more than 20 %
  repeated for the previous and current day
AND
  {
    Date is December
  OR
    Date is January
  OR
    Date is February
  }
```

## Problem Solver, Chapter 11: Event-Driven Analysis on Multiple Symbols

### Question

Create a query that looks at what happens in terms of percent move 1, 2, and 3 days later to the 2 year, 10 year and 30 year US Treasury Bond Futures when the wholesale inflation is higher than expected.

### Answer

```
LET
  @MyList = TY, TU, US

SHOW
  1: percent_move from today to 1 day later of @MyList
  2: percent_move from today to 2 days later of @MyList
  3: percent_move from today to 3 days later of @MyList
WHEN
  Date is in "ppi.rpt"
AND
  (PPI_ACT - PPI_EST) is more than 0
AND
  Date is within 2 years
```

## Problem Solver, Chapter 12: Analysis using Intraday Data

### Question

Construct a query that uses the intraday data to indicate the exact minute the low occurred for the continuous S&P 500 Future contract for the most recent trading date.

### Answer

```
SHOW
  MinuteLow: Low of SP
  Highest: lowest from 08:30 am to 03:15 pm of low of SP
  Indicator: IF
    Low of SP is exactly lowest from 08:30 am to 03:15 pm of Close
    of SP
  THEN 1
  ENDIF
WHEN
  Date is within 1 day
```

## Problem Solver, Chapter 13: Event-Driven Analysis using Intraday Data

### Question

Create a query that studies the move in the first hour of the day for the 30-year US Treasury Bond Future when The Bureau of Labor Statistics releases the Producer Price Index (PPI) within the last 10 years.



The PPI report comes out at 8:30 am EST but the time stamp on the data for US is CST since the exchange it's traded on is in Chicago.

### Answer

```
%exec.units: 1 minute
SHOW
  FirstHr: percent_move from 07:30 am to 08:30 am of Close of US
WHEN
  Time is 08:30 am
AND
  Date is in "USA_BLS_Producer_Price_Index"
AND
  Date is within 10 years
```

## Problem Solver, Chapter 14: Back-Testing Your Long-Only Moving Average Trading Strategy

### Question

Create a Profit-Loss study, that begins after 1995, to purchase 2000 shares of Dell Computer stock anytime the closing price crosses above the 1-week average of the closing price and exit upon a reverse signal.

### Answer

```
1: ORDER
  1.1: Buy 1 day later 2000 shares of DELL
      Enter on the open
WHEN
  Date is after 1995
AND
  Close of DELL crosses above 1 week average of Close of DELL
EXIT
  Close of DELL crosses below 1 week average of Close of DELL
```

## **Problem Solver, Chapter 15: Back-Testing Long & Short Moving Average Trading Strategies**

This problem solver question is self-explanatory.

## Problem Solver, Chapter 16: Using "My Queries" to Store Frequently Used Queries

### Question

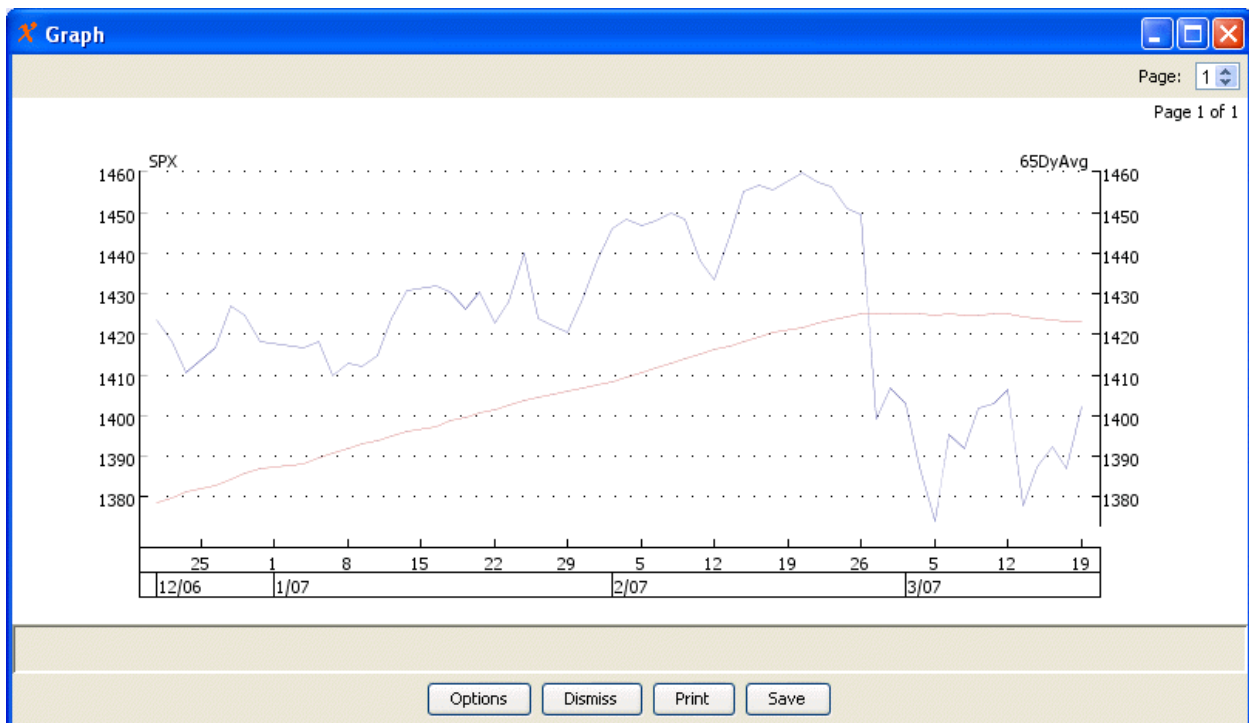
Save the query below in the **My Queries** pane as "SPX Daily".

```
SHOW
  SPX: Close of SPX
  65DyAvg: 65 value average of Close of SPX
WHEN
  Date is within 3 months
```

When completed, select the **SPX Daily** button to run this query as a graph.

### Answer

The **SPX Daily** button will be in the **My Queries** pane and when clicked on, the resulting graph displays.



## Problem Solver, Chapter 17: Bringing Data into Excel from XMIM

This problem solver question is self-explanatory.



## CHAPTER 19

# Glossary

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**Arithmetic Operator** – Attributes or data series can be combined using simple arithmetic operations like addition, subtraction, division, etc., through the use of an arithmetic operator.

**Attribute** - Attribute is a complete description of a time series - an array of numbers, organized in chronological order, usually with a regular frequency.

**Attribute Units** - Attribute unit is the default time-frequency for any attribute expression built in XMIM.

**Condition** – Condition provides the ability to restrict the results of a query or question about the markets to specific dates and times of interest.

**Condition Connector** – The condition connectors, such as AND, OR, XOR, AND NOT, are used to create compound conditions within a query (i.e. 1st Condition AND 2nd Condition).


**Custom Event** - Conditions that incorporate Attributes are built using the **Custom Events** button accessible from the **WHEN** pane of the Query Builder. The custom event general format is: <Left Attribute> <Conditional Operator> <Right Attribute>

**Date Time Condition** – The Date Time Condition provides the ability to restrict the results of a query or question about the markets to specific dates or times.

**Date Event** - Refine a query using date events accessible from the **Query Wizard**. For a description of each date event, see the "[Date Events](#)" appendix in the *XMIM User Guide*.

**Edit Pane** – The query displays within this pane after building a query using the Query Builder or the Query Wizard.

**Execution Units** - Execution units determine the time-frequency over which queries will range through the database looking for answers. The default frequency is daily but may be changed to any frequency from 1 minute to any number of years.

**How Do I Say** - Use the list of examples in the **How Do I Say** window as a starting point for building and customizing your own queries. Queries may be saved and added to this window for reuse. To access the list of examples, select the **How Do I Say**  button from the toolbar.

**Label** – The column title in the XMIM report or graph is created manually by editing the labels in the Edit pane. For example, in the query statement 1: close of NG the text 1: is the label and may be changed to any name, such as Henry Hub: .

**LET** - To invoke the LET function, select **Tools>LET** from the menu bar. The LET statement allows the user to assign properties to variables and is defined in the query above the query block. This variable may

be used to range the query over different symbols or values, used in place of complex query statements, or query data from a file. The variable may be used as a short-hand substitute that can be used again and again throughout the query.

**Market Event** - Refine a query using market events. For a description of each market event, see the "[Market Events](#)" appendix in the *XMIM User Guide*.


**ORDER** - Much of the power of the P/L module derives from the notion of an order block. An order block consists of a set of trade orders (buy, sell, and/or exit) and conditions. The trade orders are 'placed' when the conditions are satisfied. To create an order block, from the menu bar select **Tools>Add Query Block>ORDER**.

**Query** - English-like questions created to poll the database. Queries are composed of SHOW/WHEN and ORDER blocks.




**Query Builder** – Guides the user through the process of building a correct query using the XMIM language.

**Query Wizard** - Use this feature to build complex queries using pre-defined market and date events.

**Relation** – A data structure represented in XMIM by a the unique identifiers consisting of a symbol and column.

**Search Database** – Select the **Search Database**  button to locate symbols and columns in the database. In the **Short-Cut** menu, create short-cuts to often used symbols. You can use the **Tree View** menu to locate specific symbols and add them to your query. The **Search** menu allows searches by symbol or by description and can be set to narrow the search to specific categories in the MIM database.

**SHOW/WHEN** – To invoke the SHOW/WHEN function (default), select **Tools>Add Query Block>SHOW WHEN** from the menu bar. The SHOW/WHEN query allows a user to query what happens to the market when certain conditions are present. Or stated another way, the SHOW/WHEN query is constructed as a compound sentence which, in general terms states "XMIM, show me what happens to my specified data series whenever a defined condition (or conditions) are true." This type of query requires the user to specify both the market of interest and the condition or time period for which the user would like to see the market displayed. The 'market of interest' is created by defining what it is the user wants to "SHOW". This may be accomplished by either making certain menu selections using the **SHOW** pane of the **Query Builder** or by typing in the SHOW criteria directly into the **Edit** pane. Likewise, the condition or time period for which the user expects to see the market displayed is created by using the **WHEN** pane of the **Query Builder** or by typing in the WHEN criteria directly into the **Edit** pane.

**Templates** - LIM provides a list of pre-built queries (templates) that may be modified for your own use. For example, the **Templates** menu shows how to create the complicated and often used analog query. To access the list of templates, select the **Templates**  button from the toolbar. Select a template from the pull-down list to build a query. Enter the parameters and select the **Add to Query**  button to paste the modified query into the **Edit** pane of the **Query Builder** window. Select the **Return to Query Builder**  button if you want to exit the **Templates** window.

**Time Offset** - The **Time Offset** menu is used to pick a date, relative to today or the current date executed within the system.

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