

### **Good to Know**

If you hit "Update" for the stocks on the "Main" worksheet when you have not selected a few stock tickers, it will update all of them. That might be hundreds of stocks and at about 10 seconds each, it could take hours. It might be better to select just a few.

Leave the workbook open and at 1:00 am Saturday it will update all the stocks.

Columns with the yellow headings are for the user to supply information such as tickers. The columns with green headings are automated; the program gives you answers in those columns.

People said the "PM" icon does not show in Windows Vista.

## **System Requirements**

This system is compatible with Microsoft Office 2003 and Office XP.

## **The PortMan Control Panel**

Invoke the control panel using PM icon on the Excel Toolbar.

## **Main WorkSheet**

On the Main worksheet, the first row with a blank in the ticker symbol column marks the end of the list of stocks to be updated. The "Update" button works up to but not including that row. Likewise the "Delete" button works up to but not including that row. Caution: a complete update of every stock in the Main worksheet may take 3 hours if you have 1500 stocks. The "Cancel" button will stop an update in progress.

The stocks may be grouped by sector or industry or sub-industry. Regardless, all the stocks within a group should be in a contiguous set of rows. The "Update Sector Avgs" button cannot compute averages otherwise. Use Excel's Data/Sort capability on rows 4 and beyond to ensure stocks are grouped.

There is no need to update the entire main sheet at one time. To update only chosen ticker symbols, select the cells containing the ticker symbols to be updated before clicking "Update". Likewise, the "Delete" button deletes the data associated with only the selected tickers.

## **Auto-run Schedule**

The program can automatically update all stocks on the Main worksheet at 1:00am Saturday morning. In order for this to happen the workbook must be found to be open when that specific date and time comes around.

## **Adding New Records to the Main WorkSheet**

Populate new rows with entries in the columns for the "ticker", "Company", "Sector" and "Industry". These are the columns with the yellow headings. The sector names and industry names are validated so if an unknown sector or industry is keyed in, it will be erased immediately. Misspelled sector or industry names will be erased immediately. To add new sectors and industries edit the database tables tblSector and tblIndustry.

## **Date Stamp and Time Stamp**

The date and time stamps are deleted after the price is updated. The date and time stamps are renewed when after the LVE is calculated. Since the price update is the first operation and the LVE calculation is the last operation on a record, the presence of the date and time stamps indicate that a record is internally consistent.

### **Current EPS and Current P/E Ratio**

Note that in the following notes I distinguish between “current fiscal year EPS” and “current EPS”. They are not the same.

“Current EPS” is estimated to approximate the sum of the last six months of EPS plus the next six months of EPS. The PE is computed only when  $E > 0$ .

Let:

L be the “fiscal year ago EPS”,

C be the “current fiscal year EPS”,

N be the “next fiscal year EPS”, and

m be the number of months until the current fiscal year end.

Then the current EPS is estimated as follows:

If ( $m \leq 0$ )  
     $m = 0$

End if

If ( $m \leq 6$ )

$$current\_EPS = \left( \frac{6+m}{12} \right) * C + \left( \frac{6-m}{12} \right) * N$$

Else

$$current\_EPS = \left( \frac{18-m}{12} \right) * C - \left( \frac{6-m}{12} \right) * L$$

End if

Obviously, the “current PE” is calculated using current EPS.

### **NTM EPS, LTM EPS and the Forward P/E Ratio**

The forward P/E ratio is based on the NTM EPS. The LTM EPS is also calculated but not shown on the main sheet. It is calculated as an intermediate value used in calculating the growth rate.

The next 12-month EPS and the last 12-month EPS are as follows:

$$NTM\_EPS = \left( \frac{m}{12} \right) * C + \left( \frac{12-m}{12} \right) * N$$

$$LTM\_EPS = \left( \frac{m}{12} \right) * L + \left( \frac{12-m}{12} \right) * C$$

### **Growth**

Growth is calculated on EPS estimates: NTM and LTM EPS.

$$g = \frac{NTM\_EPS - LTM\_EPS}{average(NTM\_EPS, LTM\_EPS)}$$

### **Revenue Growth**

This is verbatim from the data provider and I'm showing it for the informational purpose only. The revenue growth rate is provided under the "next" fiscal year column in the data provider's table. Thus, you should be informed that it is based on current fiscal year revenue and next fiscal year revenue.

Caveats in regard to the revenue growth estimate:

1. Because of differences in fiscal years, this estimate will not be comparable across companies.
2. The revenue growth estimate is forward-looking but how far into the future the estimate looks depends upon when the program is used and the fiscal year end of the company in question.

### **Interpreting the LVE and the RFR**

The RFR (risk-free rate) is the 10 year U.S. bond yield. The LVE relies on the RFR which is displayed in cell B1. The RFR is updated if necessary when the "Update" button is clicked. The date in cell H1 determines if the update is necessary. The reciprocal of the RFR is displayed in cell E1.

### **Error Codes**

Error codes are rare and most likely do not indicate problems with the users' data and usage so they are documented in the Internal Documentation section.

### **Other Errors**

Occasionally the program will choke on what is likely to be corrupted data received from the internet. One solution is to exit Excel (with or without saving) and reopen the workbook.

### **Update Sector Avgs Button**

Compute averages for sectors, industries, or sub-industries, etc. Sectors must already be grouped (if not sorted) in the "Main" sheet, that is, all the stocks of a given sector have to be vertically contiguous in the sheet.

The default behaviour is to compute averages for the groups in column N.

This function can compute averages for groups defined in columns other than column N. It works with column M and any column to the right of column M. Select the column by clicking any cell within the column before clicking the "Update Sector Avgs" button.

The following worksheets are created:

<b>Sheet</b>	<b>Purpose</b>
Sectors	Displays averages for each sector.
Sectors PE	As above but sorted by PE.
Sectors Fwd PE	As above but sorted by Fwd PE.
Sectors LVE	As above but sorted by LVE.

The number of stocks in the sector is indicated under the column heading "n".

An average PE is computed for all the stocks in the sector that have a PE, which may not be the same as the number of stocks that have a forward PE, which may not be the same as the number of stocks that have a growth rate, which may not be the same as the number of stocks that have an LVE, which may not be the same as the number of stocks in the sector.

### **The Stock Screener and Screen Button**

The control panel has a stock screener. The "Screened" worksheet displays the stocks that passed through the screener. Once screened, the arguments used in the screen appear at the top of the "Screened" worksheet.

### **Port Sheet and the Update Hedge Button**

The "Port" sheet is for the portfolio. The portfolio consists of the long sub-portfolio and the short sub-portfolio. The short sub-portfolio is labeled as the "hedge".

"weekly  $\sigma$ " is the standard deviation of weekly continuous returns. Continuous returns are  $\ln(\frac{P_{n+1}}{P_n})$ .

"annualized  $\sigma$ "

$$\sqrt{\text{weekly\_variance}} * \sqrt{52} \text{ or equivalently } \text{weekly\_}\sigma * \sqrt{52}$$

The weekly  $\sigma$  is computed for each stock. For both the long portfolio and the short portfolio, the weekly sigma and annualized sigma are computed. The annualized return is computed for the long portfolio and the short portfolio.

"margin" is another word for collateral. A percentage of the value of a risky asset is the value of deposited collateral or "margin". A 70% margin stock is one where a \$1000 long position generates \$700 in margin. In the case of short positions, a 70% margin stock is also one where a \$1000 short position in that stock must be matched with  $\$1000 * (1 + 1 - 70\%) = \$1300$  of margin, which will be 130% of the amount that would be needed to reverse the short position. If the stock price decreases so that the value of the short position is \$900, then the margin required also decreases to  $\$900 * (1 + 1 - 70\%) = \$1170$ .

The "coefficient of correlation", symbolized by  $\rho$ , is calculated from weekly returns of the long portfolio and the short portfolio. It is a measure of the tendency of the long portfolio to move in the same direction and extent as the short portfolio. A correlation of +1 means they match each other's moves, -1 means that they tend to move in opposite directions, and 0 means their movements tend to be independent of each other.

The **Hedge ratio** is

$$\rho \cdot \frac{\sigma_{\text{long}}}{\sigma_{\text{short}}}$$

The hedge ratio determines the size of the short position needed to hedge the long position given their relative volatilities. The actual size of the short position is multiplied by a user supplied factor to modify the size of the hedge. This factor is labeled in the control panel as "Full hedged (100%) or Partial".

The "cash position (loan)" cell is for the user to enter a cash balance. A loan is entered as a negative value.

"excess margin" is margin generated less margin used. In other words it is the margin availed by long positions, plus cash, less the margin used in short positions. The cash balance may be negative.

"equity" is the total long position, plus cash, minus the total short position. The cash balance may be negative.

### **Short positions**

The total short position = long position \* hedge ratio \* percentage hedged.  
The total short position is allocated to individual short positions according to the short portfolio weights.

### **Instructions for the Usage of the Portfolio Sheet**

The yellow columns or cells indicate where the user provides data. The green columns indicate values computed by the program.

Buying stocks (increasing the number of shares held) will not cause the cash balance to be updated automatically. The user has to change the amount in the cash position (loan) field. Likewise, shorting stocks does not cause the cash balance to be updated automatically. The user has to change the amount in the cash (loan) field.

### **Stale Figures in Italics**

Numbers are formatted in *italics* to indicate stale figures. For example, if a stock ticker is added or changed in the long portfolio:

1. the long portfolio's price column will be stale because the new stock ticker needs a price update,
2. the long position column will be stale because the position depends on prices which are now stale,
3. the long weights will be stale because weights depend on the individual positions which are now stale,
4. the long portfolio's weekly standard deviation column will be stale because of the new stock ticker and because stale prices require an update which in turn forces the standard deviations to be updated,
5. the long margin column will be stale because it depends on the positions which are now stale,
6. the total position of the short portfolio and the short position column will be stale because of the newly comprised long portfolio,
7. the short position price column will be stale because stale long prices necessitate an update and that update to long prices forces an update to short prices,
8. the short position weekly standard deviation will be stale because the short position prices are stale and require an update which will in turn force the standard deviations to be updated,
9. the short shares column will be stale because of the stale short position column
10. the short position margin column will be stale because of the stale short positions,
11. all long and short portfolio measurements will be stale (weekly standard deviation, annualized standard deviation, return (annualized)) because of the stale long and short portfolios,
12. the coefficient of correlation, hedge ratio, excess margin, and equity will be stale because of the stale long and short portfolios.

Edits to other fields can have similar effects in that stale fields will be marked in italics.

### **The short portfolio**

The short portfolio weights have to total 100%. The user will be prompted to change the weights if the total does not equal 100%. In order to be less intrusive, the prompt is generated at pseudo-random intervals.

### **The "Clean-up" flag**

If the "Clean-up" flag is unchecked, the following worksheets will be visible.

Name of worksheet	
portquery	This worksheet contains a web query of the current stock prices of all the longs and all the shorts.



STOCK_TICKER	Each stock named in the portfolio will result in the creation of a worksheet that will contain a time series of stock prices. The stock ticker serves as the name of the worksheet.
COVL	A worksheet for calculating statistics related to the long portfolio.
COVS	A worksheet for calculating statistics related to the short portfolio.

### **Portfolio Limits**

The maximum number of long position holdings is 61.  
The maximum number of short position holdings is 61.

### **Options**

Enter the symbol for the stock underlying the option in the ticker column (with the yellow heading).

Currently, ticker symbols can be placed on rows up to and including row 8192. When the Options "Update" button is clicked, old options data will be cleared up to and including the same row. At most an expiry date can have 1024 strike prices.

Five years of weekly returns are used to simulate future values of the underlying stock. The weekly prices are as of the close, each Friday. They are actual closing prices split adjusted but not adjusted for dividends. The value of the underlying stock is simulated 1000 times in order to evaluate options.

<u>Column heading</u>	<u>Interpretation</u>
m - ndp	market price minus simulated price (assuming stock returns are normally distributed)
% (m - ndp)	the above amount as a percentage of the market price

### **Historical Forward PE Time Series**

The each time you update a stock on the Main worksheet the record is saved in the database. To get a chart of the historical forward PE time series, use the form that appears in the database.

The chart that is generated will be in the file named as follows:

FwdPE SS.xls

### **Date Format Convention**

The date format convention is month/day/year with no leading zeros and 4 digits for the year. Example: 3/17/2008.

## **Installation**

In all there are 5 files in the system. It is recommended that all 5 files reside in the same windows folder. It can be any folder of your choice.

In addition to the .DOC file there are the following:

PORTMAN.XLS  
DB1.MDB  
BLUE.JPG  
PM ICON.BMP

There is no requirement regarding the placement of the .DOC file.

## **Installation Problems**

Some systems may rename files when depositing them in the windows file system. In particular, spaces might be replaced with an underscore. This will cause PortMan to display an error. If there is a file named "PM\_ICON.BMP" it must be renamed to "PM ICON.BMP" in order to fix the problem.

PE	price/earnings ratio.
EPS	earnings per share.
E	earnings.
NTM	next twelve months.
LTM	last twelve months.

## **Internal Documentation**

### **Error Codes**

"Error 1" arises in the query for EPS. It means either or both of two problems  
1) the current fiscal year's ending month is not the same as the next fiscal  
year's ending month 2) the current fiscal year plus 1 is not the next fiscal  
year.

"Error 2" arises in the query for EPS. It would usually indicate that the  
trials have been exhausted.

"Error" is shown for errors of a self-evident nature so there is no  
distinguishing error number.

## Excel Web Queries

Subroutine	getlasttrade		
Purpose	Web query the current stock price.		
Cell A1	Must contain "Last Trade:"		
Cell B1	The current stock price		
Worksheet	Last Trade:	32.4	
	Trade Time:	2-Feb	
	Change:	Up 0.25 (0.78%)	
	Prev Close:	32.15	
	Open:	32.16	
	Bid:	N/A	
	Ask:	45.00 x 100	
	1y Target Est:	36.45	

Subroutine	updategrowthrate_and_estimate_current_eps				
Purpose	<p>1. Compute the EPS growth rate from next fiscal year EPS and current fiscal year EPS. This will not be comparable between companies because of their different fiscal year ends.</p> <p>2. Estimate the 'current EPS' which is defined to be the last six month's EPS plus the next six month's EPS. This will be approximately comparable between companies.</p>				
Cell A1	Must contain "Earnings Est".				
Cell E3	Next fiscal year EPS. Use this for calculating the EPS growth rate. Also use this for the computation of the current EPS.				
Cell E7	Current fiscal year EPS. Use this for calculating the EPS growth rate.				
Cell D3	Current fiscal year EPS. This is presumed to be the same value as in cell E7 but the equality is not enforced. Use this for the computation of the current EPS.				
Cell D7	Previous fiscal year EPS. Use this for the computation of the current EPS.				
Worksheet	Earnings Est	Current Qtr	Next Qtr	Current Year	Next Year
		7-Mar	7-Jun	7-Dec	8-Dec
	Avg. Estimate	0.3	0.31	1.27	1.51
	No. of Analysts	21	20	25	22
	Low Estimate	0.26	0.29	1.13	1.32
	High Estimate	0.31	0.32	1.32	1.67
	Year Ago EPS	0.24	0.24	1.05	1.27



Subroutine	getmarketcap		
Purpose	web query the current market capitalization.		
Cell A5	Must contain "Market Cap:".		
Cell B5	Must contain the market capitalization and the right-most byte must be either 'B' or 'M'.		
Worksheet	Day's Range:	32.04 - 32.69	
	52wk Range:	22.83 - 41.95	
	Volume:	16,904,656	
	Avg Vol (3m):	18,058,600	
	Market Cap:	45.17B	
	P/E (ttm):	41.01	
	EPS (ttm):	0.79	
	Div & Yield:	N/A (N/A)	

Subroutine	getrevgrowth				
Purpose	web query the revenue growth rate.				
Cell A1	Must contain "Revenue Est".				
Cell E8	Must contain the revenue growth rate.				
Worksheet	Revenue Est	Current Qtr	Next Qtr	Current Year	Next Year
		7-Mar	7-Jun	7-Dec	8-Dec
	Avg. Estimate	1.71B	1.74B	7.26B	8.63B
	No. of Analysts	22	22	26	24
	Low Estimate	1.69B	1.70B	7.01B	8.25B
	High Estimate	1.74B	1.81B	7.54B	9.29B
	Year Ago Sales	1.39B	1.41B	N/A	7.26B
	Sales Growth (year/est)	23.20%	23.50%	N/A	19.00%

Note that the current price quotes for all the longs and all the shorts are queried in a single web query.

Subroutine	portquery		
Purpose	web query current stock prices for a set of stocks.		
Cell A8	Must contain "Symbol".		
Cell B8	Must contain "Last Trade".		
Cell C9	Stock prices should be found in a range starting at cell c2 and proceeding straight down.		
Worksheet excerpt	Symbol	Last Trade	
	MSFT	4:00PM ET	19.21
	AMZN	4:00PM ET	64.354
	ORCL	4:00PM ET	17.8
	SPY	4:00PM ET	83.6
	IBM	4:01PM ET	95.16

Subroutine	update_sigma_variance_expected_return						
Purpose	Web query a time series of stock prices for each stock in the portfolio, whether long or short.						
Cell G1	Must contain a string that contains the substring "Adj Close" on the left.						
Cell G2	The time series of stock prices must be in the range of cells which includes cell G2 and cells below it. The software must be capable of dealing with the rows in which there is no price, as in the case of when a dividend was paid on MSFT shares on Nov. 14, 2006.						
Worksheet	Date	Open	High	Low	Close	Avg Vol	Adj Close*
	29-Jan-07	30.65	31.1	30.13	30.19	61,846,440	30.19
	22-Jan-07	31.06	31.48	30.45	30.6	71,465,060	30.6
	16-Jan-07	31.26	31.45	30.69	31.11	63,272,599	31.11
	8-Jan-07	29.65	31.39	29.43	31.21	70,662,200	31.21
	3-Jan-07	29.91	30.25	29.4	29.64	55,772,268	29.64
	26-Dec-06	29.53	30.15	29.4	29.86	34,194,275	29.86
	18-Dec-06	30.19	30.26	29.53	29.64	42,450,640	29.64
	11-Dec-06	29.19	30.23	29.11	30.19	82,178,818	30.19
	4-Dec-06	29.23	29.52	28.8	29.4	60,995,899	29.4
	27-Nov-06	29.69	29.78	28.9	29.12	61,930,779	29.12
	20-Nov-06	29.52	30	29.5	29.76	54,128,575	29.76
	14-Nov-06	\$ 0.10 Dividend					
	13-Nov-06	29.19	29.64	29.07	29.4	57,582,540	29.4
	6-Nov-06	28.77	29.4	28.66	29.24	64,324,660	29.14
	30-Oct-06	28.35	28.99	28.32	28.73	56,970,660	28.63
	23-Oct-06	28.3	28.79	28.04	28.34	61,935,199	28.24
	16-Oct-06	28.48	28.7	28.12	28.43	44,823,360	28.33
	9-Oct-06	27.8	28.69	27.42	28.37	71,022,240	28.27
	2-Oct-06	27.32	28.11	27.15	27.87	58,580,980	27.78
	25-Sep-06	26.81	27.52	26.79	27.35	53,473,500	27.26
	18-Sep-06	26.74	27.25	26.48	26.66	54,011,620	26.57
	15-Sep-06	26.58	26.94	26.49	26.85	126,057,696	26.76
	* Close price adjusted for dividends and splits.						

### **Weekly variance of a portfolio**

To compute the long portfolio weekly variance, the following Excel function is employed.

`MMULT(MMULT(row of weights, covariance of weekly returns table), column of weights)`

The short portfolio weekly variance is computed likewise.

This method produces the same result as Markowitz' formula for total portfolio variance.

### **CovL sheet**

This sheet contains

1. copies of the time series of returns for each stock, copied in from the stock sheets which may have been deleted in a clean-up
2. the covariance (of returns) table for the long portfolio
3. the weights copied in twice (once as a row, once as a column) from the portfolio sheet where it is originally calculated and displayed
4. calculation of the expected weekly return of the long portfolio

This sheet has the raw data to compute the long portfolio variance which gets plugged into the portfolio sheet.

This sheet has the raw data to compute the expected return of the long portfolio which is left in the CovL sheet but also gets plugged into the portfolio sheet.

### **CovS sheet**

This is the short portfolio counterpart to the CovL sheet.

### **Options Valuation**

The simulation algorithm follows.

Calculate weekly logarithmic returns of the underlying stock in a historical period that may span years.

Calculate the mean return and standard deviation of returns.

For each expiry date,

    For of many iterations,

        Simulate a terminal stock price assuming stock returns are normally distributed around the mean and standard deviation previously calculated.

        For each strike price,

            Evaluate the call and put given the simulated stock price.

Calculate the average across iterations of each call and put valuation.

## **Database Files**

The key for database tables is defined by the field or fields that are marked with '\*' (the asterisk).

tblCompanies	<p>An "Update" will cause a company record to be written if the record which is the combination of the</p> <p>[ticker, market, currency, companyName, sector, industry]</p> <p>is not already in the file.</p> <p>The fields are:</p> <p>ticker* market* currency* companyName* sector* industry* date</p> <p>The date is included so that we know when a company was first updated on the "Main" worksheet.</p>
tblSector	<p>Standard &amp; Poors GICS are used. The user has to type in new records of this sort into Access.</p> <p>The fields are:</p> <p>sectorCode* sector</p>
tblIndustry	<p>Standard &amp; Poors GICS are used. The user has to type in new records of this sort into Access.</p> <p>The fields are:</p> <p>industryCode* industry</p>
tblStockHistory	<p>All "Main" worksheet record updates will be recorded in this table.</p> <p>The fields are:</p> <p>ticker* market* currency* recordDate* recordTime* price currentEps growth Lve mktCap revGrowth forwardEps</p>
tblusyieldCurve	<p>will get a new record if the date associated with the RFR on the "Main" worksheet is not the current date. However, both the recordDate and recordTime are recorded for completeness.</p> <p>It is not normally possible to record two yield curves on the same day so there is no need to have a composite key that includes the recordTime however the recordTime was included as part of the composite key because you may want to trick the system into recording two yield curves on the same date by backdating the date on the "Main" worksheet.</p> <p>The fields are:</p>

	recordDate* recordTime* overnight thirtyday sixtyday ninetyday hundredeightyday oneyear twoyear threeyear fiveyear tenyear thirtyyear

[illegible]