Stock Portfolio Building:
Made Easy with Financial Modeling

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Step 1: Choosing Stocks

A healthy stock portfolio is one that is properly diversified. A diverse stock portfolio is simply one with stocks that are from different industries. This way, the portfolio as a whole is less prone to the upward and downward fluctuations that one industry may experience. Or more simply, it carries less risk. An ideal portfolio is one that provides the maximum amount of return at the lowest amount of risk. Here, we choose five stocks in the consumer service (PTV), industrial goods (JoyG), consumer service (CLX), technology (INTC), and restaurant (MCD) industries. To continue, gather their daily Adjusted Close Price for a period of five years on a reliable website, such as Yahoo Finance.

Step 2: Assigning Weights to Each Stock

This entails following a simple pattern in order to create a list of every potential portfolio using the chosen stocks. Begin by assigning a weight of 0 to all but one stock, which will receive a weight of 1. Reduce this stock's weight by an increment of your choice- for example, 0.2, while increasing the weight of another stock by the same increment. Continue this until you reach four weights of 0, and one of 1. Repeat this process until each stock has had the opportunity to carry every possible incremental weight per the other stocks.

W1	W2	W3	W4	W5
0	0	0	1	0
0	0	0	0.8	0.2
0	0	0	0.6	0.4
0	0	0	0.4	0.6
0	0	0	0.2	0.8
0	0	0	0	1
0	0	0.2	0.8	0
0	0	0.2	0.6	0.2
0	0	0.2	0.4	0.4
0	0	0.2	0.2	0.6
0	0	0.2	0	0.8
0	0	0.4	0.6	0
0	0	0.4	0.4	0.2
0	0	0.4	0.2	0.4
0	0	0.4	0	0.6
0	0	0.6	0.4	0
0	0	0.6	0.2	0.2
0	0	0.6	0	0.4
0	0	0.8	0.2	0
0	0	0.8	0	0.2
0	0	1	0	0
0	0.2	0	0.8	0
0	0.2	0	0.6	0.2
0	0.2	0	0.4	0.4
0	0.2	0	0.2	0.6

Step 3: Create a Variance/Covariance Matrix Using the Adjusted Close Price Data

Data Analysis > Covariance> Input Range: Highlight all adjusted close price.
The diagonal output given is the variance of the stock returns from the mean, while the remaining values are the covariances.

	PTV	JoyG	CLX	INTC	MCD
PTV	0.00056				
JoyG	0.00033	0.00159			
CLX	0.00012	0.00015	0.00016		
INTC	0.00021	0.00047	0.000124	0.0005	
MCD	0.00013	0.00022	0.00008	0.00016	0.00022

Step 4: Find the Risk and Return of All the Possible Porfolios

A. Calculate the average returns of each stock using the Average function.
B. Calculate the risk of each possible portfolio using the following formula:

$$\text{Variance}_{\text{Portfolio}} = w_1^2(\text{var}_1) + w_2^2(\text{var}_2) + w_3^2(\text{var}_3) + w_4^2(\text{var}_4) + w_5^2(\text{var}_5) + 2w_1w_2\text{cov}_{12} + 2w_1w_3\text{cov}_{13} + 2w_2w_3\text{cov}_{23} + 2w_1w_4\text{cov}_{14} + 2w_1w_5\text{cov}_{15} + 2w_2w_4\text{cov}_{24} + 2w_2w_5\text{cov}_{25} + 2w_3w_4\text{cov}_{34} + 2w_3w_5\text{cov}_{35} + 2w_4w_5\text{cov}_{45}$$

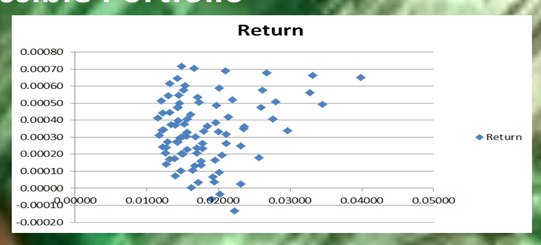
$$\text{Risk}_{\text{Portfolio}} = \sqrt{variance}$$

C. Calculate the return of each possible portfolio by multiplying each stock's weight by it's previously calculated average return, then adding them each together.

$$\text{Return} = w_1*R_1 + w_2*R_2 + w_3*R_3 + w_4*R_4 + w_5*R_5$$

Step 5: Create a Table of the Feasible Set Using the Calculated Risk and Returns for Each Possible Portfolio

This table will illustrate the possible returns of each potential portfolio



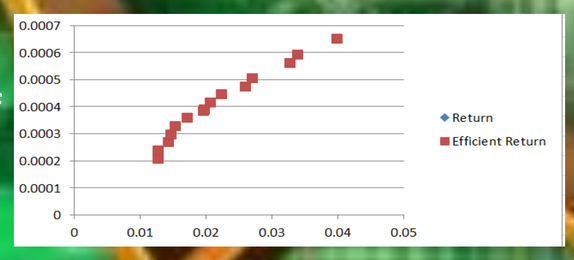
Step 6: Make the Efficient Portfolio

A. Sort the portfolios according to risk, in ascending order.
B. Create a column to the right and label it "Efficient Return." In this column, the first cell should be set to equal the value from the adjacent "Returns" column. After that, the formula should mirror that as shown below

	B	C	D	E	F	G	H	I	J
	W1	W2	W3	W4	W5	Risk	Return	Efficient Return	
	0	0	0.4	0	0.6	0.0120646	0.00051360	=H106	
	0	0	0	0.8	0.2	0.0139960	0.00003738	=IF(H107>MAX($H$106:H106), H107, 0)	
	0	0.2	0.2	0	0.6	0.0153505	0.00060220	=IF(H108>MAX($H$106:H107), H108, 0)	
	0	0	0	0.4	0.6	0.0152776	0.00037726	=IF(H109>MAX($H$106:H108), H109, 0)	
	0	0	0	0.2	0.8	0.0145146	0.00054720	=IF(H110>MAX($H$106:H109), H110, 0)	
	0	0	0	0	1	0.0148455	0.00071714	=IF(H111>MAX($H$106:H110), H111, 0)	
	0	0	0.2	0.8	0	0.0190728	-0.0000643	=IF(H112>MAX($H$106:H111), H112, 0)	
	0	0	0.2	0.6	0.2	0.0163643	0.00010555	=IF(H113>MAX($H$106:H112), H113, 0)	
	0	0	0.2	0.4	0.4	0.0142919	0.00027549	=IF(H114>MAX($H$106:H113), H114, 0)	
	0	0	0.2	0.2	0.6	0.0131594	0.00044543	=IF(H115>MAX($H$106:H114), H115, 0)	

Step 7: Draw the Efficient Set and Filter Out the Inefficient Portfolios

A. Create another table using the risk, return, and efficient return portfolios.
B. Filter out the inefficient portfolios- or ones that do not provide as much of a return than portfolios of comparable risk- by excluding all "0" values.



Step 8: Make a Decision and Enjoy

What you will be left with is a set of efficient portfolios, or portfolios that will give you the maximum amount of return per given level of risk.