

Markowitz (stock pairs) example question

The table below shows stock prices for five stocks over a number of time periods.

Period	A	B	C	D	E
0	39.7	3.1	38.2	72.9	3.6
1	73.5	0.5	96.3	60.4	77
2	17.3	42.3	62.2	49.7	91.5
3	31.6	70.8	57.2	5.2	54.7
T=4	64.4	86.9	76.1	27.1	14.3

For example in period 3 the stock/share price for stock A is 31.6.

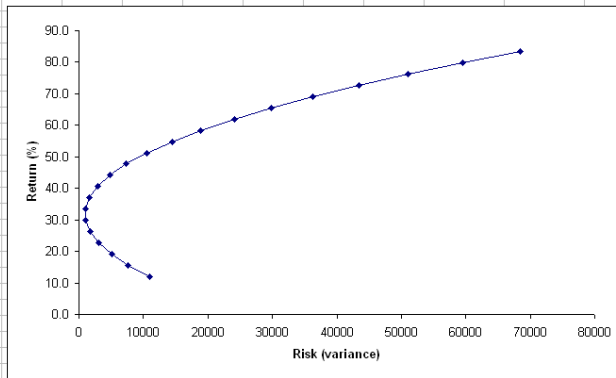
Construct a spreadsheet which shows, for any pair of stocks chosen, the portfolios that can be constructed using just the chosen pair of stocks. Your spreadsheet should plot portfolio return against portfolio risk.

Here there are ten different pairs of stocks that could be chosen. What does the plot of portfolio return against portfolio risk look like for all ten pairs of stocks?

Markowitz (stock pairs) example solution

A suitable spreadsheet is shown below that illustrates the portfolios that can be constructed using just stocks A and B.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Stock prices							Stock 1	Stock 2	Return 1 (%)	Return 2 (%)		Stock 1 weight	Stock 2 weight	Return	Risk
2	A	B	C	D	E	Period	A	B	A	B						
3	39.7	3.1	39.2	72.9	3.6	0	39.7	3.1					0	1	83.33	69512.36
4	73.5	0.5	96.3	60.4	77	1	73.5	0.5	61.69	-182.45			0.05	0.95	79.77	59487.75
5	17.3	42.3	62.2	49.7	91.5	2	17.3	42.3	-144.66	443.79			0.1	0.9	76.21	51110.11
6	31.6	70.8	57.2	5.2	54.7	3	31.6	70.8	60.25	51.51			0.15	0.85	72.65	43379.44
7	64.4	66.9	76.1	27.1	14.3	T=4	64.4	66.9	71.20	20.49			0.2	0.8	69.09	36295.73
8									12.09	83.33			0.25	0.75	65.52	29859.00
9									Average				0.3	0.7	61.96	24069.23
10									Standard deviation STDEV (2dp) RETURNS				0.35	0.65	59.40	18926.44
11									104.61	261.75			0.4	0.6	54.84	14430.61
12									Correlation CORREL (2dp) RETURNS				0.45	0.55	51.28	10581.75
13									A	B			0.5	0.5	47.71	7379.87
14									1	-0.91	A		0.55	0.45	44.15	4824.95
15									-0.91	1	B		0.6	0.4	40.59	2917.00
16													0.65	0.35	37.03	1656.02
17													0.7	0.3	33.47	1042.01
18													0.75	0.25	29.90	1074.96
19													0.8	0.2	26.34	1754.89
20													0.85	0.15	22.78	3081.79
21													0.9	0.1	19.22	5055.65
22													0.95	0.05	15.66	7676.49
23													1	0	12.09	10944.29
24														min		1042.01



In order to construct the plot of portfolio return against portfolio risk for all ten pairs of stocks we need to use the above spreadsheet to get the return and risk values for each of the ten pairs (A,B; A,C; A,D; etc), then plot them all on a single chart. This can be seen below.

