

PORTFOLIO THEORY – ASSIGNMENT 1

Dr. Andrea Rigamonti

Consider the five stocks from the dataset you were assigned.

- 1) Create a scatterplot with the standard deviation on the horizontal axis and the mean return on the vertical axis for each stock.
- 2) Compute the mean and standard deviation of a portfolio with the following weights:

$$0.3, -0.1, 0.4, 0.1, 0.3$$

- 3) Add the portfolio to the scatterplot.
- 4) Compute the evolution of the value of this portfolio over time assuming we invested a unit of wealth one month before the time of the first return.
- 5) Plot this wealth dynamics in a graph.
- 6) Compute the monthly real returns (i.e., accounting for the inflation) of the portfolio.
- 7) Plot the evolution of the real wealth of the portfolio over time.
- 8) Compute the beta of each single stock and the beta of the portfolio.
- 9) Compute the expected return of the single stocks and of the portfolio according to CAPM.
- 10) Plot the capital market line and the security market line. In both plots show where the single stocks and the portfolio stand.

The necessary data are provided in the file “assignment_dataset.RData”, which can be downloaded from the online folder that contains the course material.

The student has to write a report (you can use Microsoft Word and then export it in PDF) to illustrate the results obtained with the R code. The report must contain the most important numeric results (e.g., a table with the mean, standard deviation, beta, and expected return according to CAPM of the single stocks and of the portfolio) and the plots, with some short comment to give them context.

Both the R code and the report have to be uploaded in the Homework Vault by midnight of April 2. You can use any aid to write the R code, including working together with other students, but you must write the report on your own.

See next page for the set of five stocks assigned to each student.

STUDENT ID	STUDENT NAME	STOCK 1	STOCK2	STOCK 3	STOCK 4	STOCK 5
533309	Abidi, Hamdi	ADSK	AXP	BIIB	CHRW	PCAR
544134	Ahmad, Muhammad	ADI	DD	GE	REGN	VEON
533377	Çoban, Ali Berk	AMAT	CVX	INTC	LRCX	WBA
546128	Dadzie, Emmanuel	CAT	CMCSA	FAST	ROST	SRCL
556298	Dalil, Chaima	BMRN	KLAC	ORLY	SRCL	VEON
556752	El feddali, Aymane	COST	GILD	HD	INTU	TXN
543393	Elizer, Archedard Josue	ADBE	CHKP	GE	KO	ORLY
556314	Guin, Supriya	CHKP	FISV	INCY	INTC	VEON
520714	Hossain, Md Shepon	DD	GILD	MAR	TRV	WDC
546172	Choudhary, Vishal	GS	INCY	SBAC	SIRI	SWKS
533365	Khan, Sumaila	ADSK	AMGN	INTU	MCD	UNH
545749	Khouaja, Waeil	CTSH	ORLY	QCOM	VOD	WBA
547427	Kolomiiets, Polina	CAT	DD	NTAP	SIRI	TSCO
556296	Lum Mafor, Nora	CHRW	GS	IBM	SBUX	TXN
546195	Meftun, Feridun Batu	ADSK	AMGN	AMZN	CVX	EBAY
546204	Mia, Md Rubel	CHRW	GE	KO	MAR	MNST
546168	Mishu, Taslima Rahman	BIIB	CHKP	COST	EXPD	PG
556305	Myat, Aye Thiri	ADI	CHKP	MAT	NVDA	VOD
556316	Nascimento Vianna, Cecilia	CAT	CVX	HSIC	KLAC	PAYX
546206	Osayawe, Isio Sarah	AMZN	BA	MU	NLOK	XOM
556287	Oyeyele, Funmilayo	ADP	CAT	CHKP	KLAC	NLOK
528037	Shiroiya, Darshit Jayesh	CMCSA	GS	MAR	PAYX	SIRI
546144	Yosra, Touirtou	CHRW	COST	SBAC	WMT	XOM
546231	Zafar, Mutahar	ADSK	AKAM	MSFT	SBAC	XOM