SIMON FRASER UNIVERSITY
Department of Economics

Econ 815 — Prof. Kasa
Financial Economics I — Fall 2025

PROBLEM SET 1
(Due October 20)

1. (20 points). Suppose the expected return on the market portfolio is 11%, and the risk-free rate is 1%. The standard deviation of the market portfolio is 20%. Assuming the CAPM holds,

   (a) What is the equation of the 'Capital Market Line'?

   (b) If you desire a 8% expected return, what will be the associated standard deviation of this position (assuming it's efficient)? If you have $1000 to invest, how should you allocate it to achieve this position?

2. (30 points). This question asks you to estimate and test the CAPM. On the course webpage, I've posted two excel files: Fama-French-factors.xls and Fama-French-ports.xls. They contain monthly stock return data from the USA for the period 1926-2019. Column B in Fama-French-factors contains a time-series of market excess returns (Mkt-RF). Columns B-Z of Fama-French-ports contains time-series data on the returns of 25 portfolios sorted by size and book-to-market. (There are 5 categories of size and book-to-market ratios, and Fama & French form 25 portfolios by interacting them with each other).

   (a) Plot the market excess return. What is its mean? What is the Sharpe ratio? (Note: Use whatever software you want).

   (b) Compute the mean returns for the 25 Fama-French portfolios. Which have the highest average return? Which have the lowest?

   (c) Compute (full-sample) β's for the 25 portfolios, by running 25 separate bivariate time-series regressions of portfolio returns on the market excess return. (Be sure to include an intercept). Save the 25 β estimates you get.

   (d) Now do a single cross-sectional regression of the (average) returns of the 25 portfolios onto their β's. (Again, include an intercept). Plot the actual vs. fitted regression line. What is the R^2 (ie, what proportion of the variation in mean returns on $size \times book/market$ sorted portfolios can be explained by the CAPM? Is the estimated slope (approximately) equal to the market excess return? (Note: You don't need to compute a formal test statistic).