

Math 420, Spring 2022

Team Homework 5

due Wednesday, 6 April, 2022

In the following exercises consider the risky assets in groups (A), (B) and (C) of your **Project Two**. Use adjusted closing prices to compute the return of each asset for each trading day over the last five calendar years — namely, the years ending on December 31 of 2017-2021.

There are 20 quarters within this five year period. There are 17 one-year periods within these five years — the first consisting of quarters 1-4, the second consisting of quarters 2-5, and so on until the last consisting of quarters 17-20. We call the return histories over these 17 one-year periods *rolling histories* and label each by its last quarter.

Exercise 1. For each asset compute ω^m and ω^v for each one-year period by comparing each quarter to every other quarter in the one-year period. (So that there are six comparisons made in each one-year period.) Plot ω^m and ω^v as a function of the last quarter in the period. There should be nine plots, one for each asset.

Exercise 2. For each asset compute ω^{KS} and (optional) ω^{Ku} for each one-year period by comparing each quarter to every other quarter in the one-year period. (So that there are six comparisons made in each one-year period.) Plot ω^{KS} and (optional) ω^{Ku} as a function of the last quarter in the period. There should be nine plots, one for each asset.

Exercise 3. For each asset compute ω^{ar} and ω^{ac} for each one-year period. Plot ω^{ar} and ω^{ac} as a function of the last quarter in the period. There should be nine plots, one for each asset.

Exercise 4. Based on your answers to the previous exercises, identify which of your nine assets are better described by an IID model in each year. Give your reasoning. Which of the metrics were the most useful in reaching your conclusion?