



FIN 3080 Investment Analysis and Portfolio Management

SPRING 2022 CUHK(SZ)

PROJECT 2

Instruction:

1. You have **7** days to complete the project and the deadline is on **Thursday, 8:00 am April 21st, 2022**. Late submission of assignments will not be accepted.
2. Please submit your answer in PDF (name your file with the format “Student ID1+XXX, Student ID2+XXX, Student ID3+XXX”). One group member submits your group assignment.
3. Submit the **code files** as an attachment.

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Case1

你的老板最近在一个会议上听说了原来资本市场上还有个 CAPM，想要了解下 CAPM 到底能不能解释中国市场上的股票回报率，于是让你利用周末去检验一下。你虽然学习过 CAPM 的原理，但是从来没有实际检验过，于是去查阅了相关资料，发现有两篇论文可以参考，这两篇论文用同样的方法分别检验了中国和美国股票市场上 CAPM 是否成立。通过学习这两篇论文你掌握了检验的方法，决定使用 2017 年 1 月 1 日至 2020 年 12 月 31 日间深圳和上海主板（包括中小板）所有股票周回报率进行 CAPM 检验。你老板大约懂得 CAPM 原理，但是显然没有读过这两篇论文，因此你需要仔细写明检验步骤和基本检验想法，以及所有结果。你老板当然喜欢更加直观的图表结果，但是你也想展示出自己的严谨性，因此要用表格结合图形的形式报告你的主要结论。

Case2

(1) 你在量化基金工作，你的老板在某个会议上听说有人通过交易小市值股票获得不错收益，因此想看看是不是真的如此，他让你去检验是不是小市值股票的回报率平均高于大市值股票。你决定使用沪深主板（包括中小板）所有股票来检验。你老板最喜欢简单直接的通过构造 10 个不同 portfolio (最好每个月都根据公司市值来重新分配股票到不同的 portfolio)，比较不同 portfolio 回报率来说明问题。可以根据课堂讲解以及你们的发现构造 long-short portfolio 来计算策略的平均月回报率，以及 CAPM alpha。(月度回报率数据从 2006 年开始)

(2) 你希望在老板面前露一手，因此希望进一步探索其它可能产生高回报率的市场传言。比如你听说股票市场上有所谓追涨杀跌的策略，根据过去 1 个月或者 3 个月的回报率来选股然后持有 1 月，再重复根据过去 1 个月或者 3 个月的回报率来选股票，持有一个月，每月如此。你可以试一试比如还是分 10 组，那些上一月(三个月)回报率高的股票是否下月平均回报率还是高？可以根据课堂讲解以及你们的发现构造 long-short portfolio 来计算策略的平均月回报率以及 CAPM alpha。(月度回报率数据从 2006 年开始)



(3) 最后,你听说巴菲特喜欢买便宜股票比如 P/B 比率比较低的股票,能否通过分组法来检验是否 P/B 比率低的股票未来的回报率比较高? 能否据此构造个量化策略计算平均回报率和 α ? (月度回报率数据从 2006 年开始)

(4) 离提交报告还有点时间,你想再试试能不能帮老板寻找其它的交易策略,毕竟如果你寻找的策略能够产生比较高的回报率,不但今年 bonus 稳了,说不定还能加速自己的晋升。(月度回报率数据从 2006 年开始)

Case1

(1) Recently your boss heard about the CAPM model in a meeting. Since he wants to know whether CAPM really can explain the return in the Chinese stock market, he asks you to test it during the weekend. Although you studied CAPM in many classes, you never tested it using real-world data. So, you first search the academic journals and find two papers about empirically testing CAPM in the Chinese stock market and the US stock market. After studying these two papers, you decide to use the weekly returns of all stocks listed on both Shenzhen and Shanghai Main Board (including small and medium-sized boards) from January 4, 2017, to December 31, 2020, for CAPM testing. You need to carefully write down the steps and explain each step (and of course the results) to your boss, who is smart and picky. Your boss might prefer intuitive graphical results, but you also want to show the rigorous quantitative results. Please report your main findings in both tables and graphs.

Case2

(1) You are an intern in a quantitative hedge fund. Your boss heard a good strategy about trading small-capitalization stocks in a meeting. He wants to see if this is the case. He asks you to test whether the small-cap stocks have an average return higher than large market capitalization stocks. You decide to use all stocks listed on the Shanghai and Shenzhen mainboards (including the small and medium-sized boards) for the test. Your boss prefers to test using portfolio construction methodology as we have discussed in the class. Please construct 10 different portfolios based on the firm size every month and compare the average returns of the 10 portfolios. Please build up a long-short strategy based on your findings and our lecture note. Calculate the average return of the strategy and the α of the CAPM model (Please use monthly stock return data starting from 2006) (Please use the monthly stock return data since 2006)



- (2) Since you want to take the opportunity to impress your boss, you will explore other market rumors that may generate high returns. For example, you have heard that there is a strategy of chasing ups and downs in the stock market. More specifically, one first calculates the realized return in the past 1 month or 3 months for each stock and divides them into 10 portfolios based on the past return. Then hold the stocks in each portfolio for 1 month. Repeat the same procedure and reallocate stocks into each portfolio every month. Examine whether the past winners would generate a higher return than past losers? Please build up a long-short strategy based on your findings and our lecture note. Calculate the average return of the strategy and the alpha of the CAPM model (Please use monthly stock return data starting from 2006)
- (3) Finally, you heard that Buffett likes to buy cheap stocks, such as stocks with low P/B ratios. Can you use the sorting and portfolio construction method to test whether stocks with low P/B ratios would generate higher returns in the future? Please construct a long-short strategy based on your finding. Calculate the average return of the strategy and the alpha of the CAPM model (Please use monthly stock return data starting from 2006).
- (4) Please try to propose and test another strategy.