

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	FIN5020 金融资产定价实证 Empirical Financial Asset Pricing
2.	课程性质 Compulsory/Elective	专业选修课 Major Elective Courses
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	中英双语 English & Chinese
5.	授课教师 Instructor(s)	王缘, 金融系 Email: wangy36@sustech.edu.cn Yuan Wang, Department of Finance
6.	是否面向本科生开放 Open to undergraduates or not	否 No
7.	先修要求 Pre-requisites	投资学、编程 (C++/Python/R/Matlab) Investment, Coding (C++/Python/R/Matlab)
8.	教学目标 Course Objectives	<p>本课程涉及到有关金融资产定价相关多方面知识, 所包含的主题有: 均衡定价、套利定价 (风险中性定价)、行为金融、股票市场单 (多) 因子资产定价、异象研究、机器学习、期权定价理论、希腊值和波动率等等。本课程不仅要为学生们提供完备的金融资产定价理论基础, 更着重于引导他们基于中国金融市场, 对中国金融资产定价的理论和实践进行深入的探究。本课程对学生的编程能力有一定要求。</p> <p>This course covers a wide range of knowledge related to financial asset pricing. The topics include equilibrium pricing, arbitrage pricing (risk-neutral pricing), behavioral finance, single (multi) factor asset pricing models of stock market, anomaly research, machine learning, option pricing theory, Greek value, volatility, etc. This course not only provides students with a complete theoretical basis for financial asset pricing, but also helps them to conduct in-depth research and practice based on the China's financial market. This course requires certain level of computer programming skills.</p>
9.	教学方法 Teaching Methods	<p>1. 讲授 1.Lectures 2. 实验/辅导/讨论 2.Tutorials</p>
10.	教学内容 Course Contents	<p>Section 1</p> <p>金融资产定价实证 (3 学时) 在本章节中, 学生将:</p> <ol style="list-style-type: none"> 1. 理解均衡定价、套利定价 (风险中性定价)、行为金融等基本概念; 2. 了解金融资产定价理论的基本脉络和发展历程; 3. 了解本课程的课程目标。 <p>Introduction to Empirical Financial Asset Pricing (3 hours) In this chapter, students will learn about:</p> <ol style="list-style-type: none"> 1. basic concepts such as equilibrium pricing, arbitrage pricing (risk-neutral pricing), behavioral finance, etc; 2. basic profile and development process of financial asset pricing theory; 3. course objectives of this course.

<p>Section 2</p>	<p>利率、债券价值、股票价值分析（3 学时）</p> <p>在本章节中，学生将理解利率、债券和股票价格的估值方法。理解未来红利和贴现率的预期是股价的决定性因素。我们拟在本章节中加入与课程相关的习题来对学生进行辅助学习。</p> <p>Interest Rate, Bond Value and Stock Value Analysis (3 hours)</p> <p>In this chapter, students will learn about interest rates and the valuation methods of bond prices and stock prices. Understand that expectations of future dividends and discount rates are decisive factors in stock prices. We plan to add course-related exercises in this chapter to assist students.</p>
<p>Section 3</p>	<p>单因子（CAPM）资产定价模型（3 学时）</p> <p>在本章节中，学生将了解基于均衡资产定价理论的单因子（CAPM）资产定价模型及 CAPM 不能解释的金融市场异象（规模效应、股息效应、市盈率效应等）。我们拟在本章节中加入与课程相关的实证案例来对学生进行辅助学习。</p> <p>Single Factor (CAPM) Asset Pricing Model (3 hours)</p> <p>In this chapter, students will learn about the single-factor (CAPM) asset pricing model based on the equilibrium asset pricing theory and the financial market anomalies (scale effect, dividend effect, price-earnings ratio effect, etc.) that CAPM cannot explain. We plan to add empirical cases related to the course in this chapter to assist students.</p>
<p>Section 4</p>	<p>多因子资产定价模型（3 学时）</p> <p>在本章节中，学生将了解多因子资产定价的主要模型及其发展脉络，其中包括 Fama-French 三因子模型、Carhart 四因子模型、Hou-Xue-Zhang 四因子模型、Fama-French 五因子模型。</p> <p>Multi-Factor Asset Pricing Model (3 hours)</p> <p>In this chapter, students will learn about the main models of multi-factor asset pricing and their development process, including the Fama-French three-factor model, the Carhart four-factor model, the Hou-Xue-Zhang four-factor model, and the Fama-French five-factor model.</p>
<p>Section 5</p>	<p>异象研究（3 学时）</p> <p>在本章节中，学生将了解由预期差造成的估值高低异象、短期反转异象和特质波动率异象。我们拟在本章节中加入与课程相关的实证案例来对学生进行辅助学习。</p> <p>Anomaly Research (3 hours)</p> <p>In this chapter, students will learn about the valuation anomaly, short-term reversal anomaly and idiosyncratic volatility anomaly. We plan to add empirical cases related to the course in this chapter to assist students.</p>
<p>Section 6</p>	<p>媒体与投资者情绪（3 学时）</p> <p>在本章节中，学生将了解媒体与资产价格的传导机制，及投资者情绪对资产价格的影响。</p> <p>Media and Investor Sentiment (3 hours)</p> <p>In this chapter, students will learn about the transmission mechanism of media and asset prices, and the impact of investor sentiment on asset prices.</p>

<p>Section 7</p>	<p>机器学习与因子研究（3 学时）</p> <p>在本章节中，学生将了解机器学习（主成分分析、随机森林、强化学习等）在因子研究上的应用。</p> <p>Machine Learning and Factor Research (3 hours)</p> <p>In this chapter, students will learn about the application of machine learning (principal component analysis, random forest, reinforcement learning, etc.) in factor research.</p>
<p>Section 8</p>	<p>探索中国股票市场资产定价（4 学时）</p> <p>在本章节中，学生将按小组分别探索中国股票市场资产定价。包括：单因子模型、Fama-French 三因子模型、Carhart 四因子模型、Hou-Xue-Zhang 四因子模型、Fama-French 五因子模型等。</p> <p>Explore Asset Pricing in China's Stock Market (4 hours)</p> <p>In this chapter, students will explore asset pricing in the China's stock market in groups. Including: single factor model, Fama-French three factor model, Carhart four factor model, Hou-Xue-Zhang four-factor model, Fama-Frence five-factor model, etc.</p>
<p>Section 9</p>	<p>无套利定价理论基础（3 学时）</p> <p>在本章节中，学生将了解完备市场，Arrow-Debreu 市场和风险中性。理解风险中性世界与真实世界的关系，掌握风险中性定价。我们拟在本章节中加入与课程相关的练习题目来对学生进行辅助学习。</p> <p>No-Arbitrage Pricing (3 hours)</p> <p>In this chapter, students will learn about the complete market, Arrow-Debreu market and risk neutrality. Understand the relationship between the risk-neutral world and the real world, and master risk-neutral pricing. We intend to add course-related exercise questions in this chapter to assist students.</p>
<p>Section 10</p>	<p>期权定价（3 学时）</p> <p>在本章节中，学生将理解期权定价的方法，掌握如何求解 Black-Scholes 公式（风险中性鞅方法推导和偏微分方程推导）。</p> <p>Option Pricing (3 hours)</p> <p>In this chapter, the learner will learn about the method of option pricing and how to solve the Black-Scholes formula (risk-neutral martingale method derivation and partial differential equation derivation).</p>
<p>Section 11</p>	<p>BS 期权定价模型的局限及拓展（3 学时）</p> <p>在本章节中，学生将理解 BS 期权定价模型的局限，了解基于 BS 模型拓展的其他模型（Heston、SABR 等）。</p> <p>Limitations and Expand BS Option Pricing Model (3 hours)</p> <p>In this chapter, students will learn about the limitations of the BS option pricing model, and other expansion models (Heston, SABR, etc.) based on the BS model.</p>
<p>Section 12</p>	<p>波动率及期权波动率交易（3 学时）</p> <p>在本章节中，学生将理解历史波动率、已实现波动率、隐含波动率、的概念与区别。了解波动率在期权交易中的作用。我们拟在本章节中加入与课程相关的实证案例来对学生进行辅助学习。</p>

	<p>Volatility and Options Volatility Trading (3 hours)</p> <p>In this chapter, students will learn about the concepts and differences between historical volatility, realized volatility, and implied volatility. Understand the role of volatility in options trading. We plan to add empirical cases related to the course in this chapter to assist students.</p>
<p>Section 13</p>	<p>理解波动率指数 (VIX) 和偏度 (SKEW) (3 学时)</p> <p>在本章节中, 学生将了解 VIX 和 SKEW 的理论推导及构建方法, 理解其经济学含义。</p> <p>Volatility Index (VIX) and Skewness (SKEW) (3 hours)</p> <p>In this chapter, students will learn about the theoretical derivation and construction methods of VIX and SKEW. Understanding their economic implications.</p>
<p>Section 14</p>	<p>动态对冲 (3 学时)</p> <p>在本章节中, 学生将了解希腊值 (Delta、Gamma、Vega、Theta、Rho) 及 Delta 对冲。我们拟在本章节中加入与课程相关的练习题目来对学生进行辅助学习。</p> <p>Dynamic Hedge (3 hours)</p> <p>In this chapter, students will learn about Greek values (Delta, Gamma, Vega, Theta, Rho) and Delta hedging. We intend to add course-related exercise questions in this chapter to assist students.</p>
<p>Section 15</p>	<p>探索中国期权市场资产定价 (5 学时)</p> <p>在本章节中, 学生将按小组分别探索中国期权市场资产定价, 自主确定研究课题。</p> <p>Explore Asset Pricing in China's Options Market (5 hours)</p> <p>In this chapter, students will explore asset pricing in China's options market in groups and independently determine research topics.</p>
<p>11. 课程考核 Course Assessment</p>	
<p>1. 考核形式</p> <p>期中考核: 在本次测评前, 我们拟对学生进行小组划分, 并公布关于中国股票市场资产定价课题, 学生以小组的形式完成课题报告, 并在测评课上进行小组间的同行评审, 最终将评审分数作为课程总成绩的一部分。</p> <p>期末考核: 采用分组的形式, 让学生根据已经具备的金融资产定价实证知识, 聚焦中国期权市场自主研究探索一个中国资产定价实证的相关课题, 进行答辩, 并完成论文。</p> <p>2. 分数构成</p> <p>课堂表现占比 20%, 期中考核占比 30%, 期末考核占比 50%。</p> <p>1. Form of Examination</p> <p>Mid-Term Assessment: Before this evaluation, we plan to divide the students into groups and announce topics of asset pricing in the Chinese stock market. Students complete a topic report in the form of a group, and conduct peer review between groups in the evaluation class, and the score is used as part of the overall grade of the course.</p> <p>Final Assessment: In the form of group, the students will research and explore a China's empirical asset pricing topic based on</p>	

their financial empirical asset pricing knowledge, conduct a defense, and complete the thesis. We will score this item in the form of a group scoring and combine this score with the mid-term test score and class performance score as the final score of the course.

2. Grading Policy

Class performance accounted for 20%;

Mid-term assessment accounted for 30%;

Final assessment accounted for 50%.

12. 教材及其它参考资料

Textbook and Supplementary Readings

1. 中国资产定价实证——聚焦股票市场投资策略的研究（汪昌云，2020）
2. Empirical Asset Pricing—The Cross Section of Stock Return (TURAN G.BALI,2016)
3. Options Volatility Trading—Strategies for Profiting from Market Swings（Adam Warner）

（本课程不需要购买教材）

(No need to purchase textbooks for this course)