

Universities of Lausanne, Geneva and EPFL
Swiss Finance Institute
Ph.D. Program
Arbitrage and Equilibrium

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Announcements

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Objectives

The objectives of this course are to provide an analysis of single and multiple factor pricing models. We focus on both static and dynamic settings, allowing for both equilibrium and arbitrage-free approaches.

Grading

The grading for this course will consist of **two separate** final exams worth 100% of the final grade, i.e. one for each professor.

1 Static models

1. Preferences (St-Amour)

- Axioms
- Expected utility
- Risk aversion

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2. Efficient analysis (**St-Amour**) (Huang and Litzenberger, 1988, ch. 3), (Campbell et al., 1997, ch. 5.2)
 - Frontier
 - Separation
 - Linear valuation
3. CAPM (**St-Amour**) Sharpe (1964), Lintner (1965), Mossin (1966)
 - Individual optimality
 - Stein's lemma and quadratic preferences
 - Equilibrium
 - Existence of risk-free asset
4. APT (**St-Amour**) Ross (1976), (Campbell et al., 1997, ch. 6)
 - Individual optimality
 - Equilibrium
 - Market base
5. Static arbitrage I (**Berrada**)
 - Security markets
 - Martingale measure
 - Fundamental theorem of asset pricing I & II
6. Static arbitrage II (**Berrada**)(Duffie, 2001, ch. 1)
 - Contingent claim and derivatives
 - Arbitrage bounds
 - Hedging and super-hedging
 - Examples
7. Static equilibrium (**Berrada**)(Duffie, 2001, ch. 1)
 - Optimality and pricing
 - Efficient allocation
 - Complete markets

2 Dynamic models

8. Dynamic Programming (**St-Amour**) (Duffie, 2001, chs. 2-4)
 - Bellman approach
 - Envelope condition (Benveniste and Scheinkman, 1979)
 - Markov pricing
9. I-CAPM (**St-Amour**) Merton (1971), (Duffie, 2001, ch. 9)
 - Individual optimality
 - Equilibrium yields: Multiple factors
 - Myopic and hedging portfolios
 - Factor-replicating portfolios
10. C-CAPM (**St-Amour**) Lucas (1978), Breeden (1979), (Duffie, 2001, ch. 10), (Singleton, 2006, ch. 10), (Campbell et al., 1997, ch. 8)
 - Euler representation
 - Competitive equilibrium: Existence and unicity.
 - Pricing income streams
 - Covariance decomposition
 - Log-normal pricing
11. Information (**St-Amour**) Rothschild and Stiglitz (1976), Grossman and Stiglitz (1980), Admati (1985)
 - Informational efficiency
 - Noisy rational expectations equilibrium
12. Discrete-time Arbitrage (**Berrada**) (Duffie, 2001, ch. 2)
 - Arbitrage
 - Security markets
 - Individual optimality
 - Equilibrium
 - Arbitrage and martingale measures
13. Continuous-time Arbitrage (**Berrada**)(Duffie, 2001, chs. 5-9)
 - Market model
 - Martingale measure
 - Examples

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