University of Basel
Faculty of
Business and Economics

WW Z

Prof. Dr. Heinz Zimmermann
Kaspar Burghartz
Department of Finance
Fall 2022

No. 42778-01

Asset Pricing II: Dynamic Models
Volatility and the persistence of risk in asset pricing

This is the same course which has been previously (until 2021) taught as "Intermediate Finance".

Prior attending of Asset Pricing I (former Advanced Asset Pricing) can be helpful but is not a prerequisite for this course.

Instructors

Prof. Dr. Heinz Zimmermann, heinz.zimmermann@unibas.ch (HZI)

See the website: https://wwz.unibas.ch/de/zimmermann/

Kaspar Burghartz, MSc, kaspar.burghartz@unibas.ch (KBU)

Assessment/Exams/Credits

The course is worth **3 ECTP**. Grading is based on a written final exam (70%) and a homework (30%).

Interested students can **upgrade** this course to **6 ECTP.** This requires extra lectures (2 x 90 Minutes) plus an extra homework or an in-class presentation. This extra achievement will be recorded under "Asset Pricing III" in the study records.

Please contact the teacher before/at the beginning of the semester. A Learning Contract ("Studienvertrag") has to be set up with the Studiendekanat to validate the extension. The contract must be submitted *online* based on the guidelines attached at the end of this syllabus. In this case, grading is based on the written final exam (50%) and homeworks/presentation (50%).

Course Objective

This course aims at giving the participants a new – long run or dynamic – perspective about risk in financial markets, which strongly differs from the traditional conception of risk in standard finance models.

The classic asset pricing models (CAPM, APT) do not explicitly take the time dimension of financial decisions and risks into account. This is a rather strong limitation. In an intertemporal setting, risk is not simply characterized by volatility (or higher moments). The early excess volatility literature is a good example of the pitfalls in applying statistical one-period models to economic multi-period models.

In this course, we want to extend this perspective by developing a theoretical and empirical framework for analysing intertemporal risks related to persistence and predictability, and the associated long-term pricing effects.

Specifically, we cover the following issues:

- We start with a recap of statistical and econometric fundamentals (properties of expectation and (co-)variance, basic time series concepts) that we will need for the economic models discussed thereafter
- We discuss the "excess volatility puzzle" of Shiller which claims that stock prices are too volatile compared to expected futures dividends, and discuss conditional and unconditional volatility tests
- We develop a simple framework for analysing the dynamic relationship between market fundamentals, expected cash flow (dividends) growth rates and discount rates
- We address intertemporal valuation problems by an analysis of the variability and predictive power of dividend-price and other valuation ratios
- We learn how to measure the persistence of economic shocks using basic time-series models, and how to model changing expectations ("news") about future cash flows and discount rates
- We derive the asset pricing implications of models that account for persistent changes in the economic environment and in expected returns
- We specifically address the empirical relevance of LRR-models (long run risk models), developed by Campbell and co-authors and Bansal/ Yaron
- We discuss a major application of LLR models: a potential explanation of the size and value premium

Overall, the course combines traditional (fundamental) valuation models with time series econometrics and intertemporal asset pricing.

Prerequisites

Standard textbook finance (portfolio theory, asset pricing, option pricing) and microeconomics are required to follow the course. Students who have taken "Advanced Macro and Finance" will have a definitive advantage. The empirical part of the course requires basic econometrics. Exercises in the Computer-Lab complement the lectures.

We use the following econometric techniques:

- Predictive linear regression models
- Autoregressive models (very simple ones, AR(1))
- Vector autoregression models (VAR)

Notice that guided exercises are an important part of this lecture.

An excellent quick reference with E-Views applications is:

➔ *Brooks, Chris: "Introductory Econometrics for Finance", Academic Press, 2019, 4th edition*, Chapters 3, 6, 7 (esp. 7.10 ff); approx. 55 €

Course Material

The basic material (theory and detailed derivations) is covered by a book draft which is uploaded; see [LRR] behind:

➔ *Zimmermann, Heinz: "Long Run Risk in Financial Markets", approx. 120 p.*

Notice that this is an incomplete "working" document, and comments are still very welcome. Additional handouts and readings are distributed which include material from empirical studies.

Complimentary material or readings (papers, review articles) are put on the website in advance of the lectures. Most of this material is background reading. I will tell in the course what is relevant for the exam.

An extremely useful textbook written by an author who contributed extensively to the topic discussed in this lecture:

➔ *Campbell, John: "Financial Decisions and Markets. A Course in Asset Pricing", Princeton University Press, 2018*; see Chapters 5 and 6; approx. 51 €

If you wish additional references related to specific topics discussed during the lecture, do not hesitate to contact us.

Organisation

Notice that the lecture does *not* take place weekly, but in 4-unit blocks from 12:15 to 16:00 in selected weeks (see pages 5 and 6)

First lecture:	Thursday, 22 September 2022	12:15-16:00
Last lecture:	Thursday, 10 November 2022	12:15-16:00
Final exam:	tbd	tbd

For the 6 ECTS Format:

Additional lectures/presentations:

Thursday, 17 November 2022	12:15-16:00
Thursday, 01 December 2022 (Reserve)	12:15-16:00

Location: will be announced

Master Seminar or Seminar Thesis

The material covered in this course offers a wide range of topics suitable for empirical research projects for seminar or master theses. It is strongly recommended (if not indispensable) that this course is taken by those students who intend to take the Master Seminar in Finance or write their Master Thesis in the field of empirical finance. We encourage students to discuss possible research topics well in advance.

Course outline

Location: Seminarraum S15, WWZ, and Computer Lab

Date		Topic	Reading
22 Sep	1	**Basics** Random walks, Martingales, conditional expectations EX(1) Autocorrelation and persistence	LRR-1 LRR-2 Campb2003
29 Sep 06 Oct	2	**Excess volatility** Shiller's excess volatility puzzle A rational model with dividend smoothing Gordon model EX(2) Simple model of excess volatility	LRR-1 LeR1984
06 Oct	3	**Predictability** Predictive regression, long-horizon effects, econometric issues EX(3) Predictive regressions	LRR-2 PRED Emp
13 Oct	4	**Predictive analysis of financial ratios** Campbell-Shiller decomposition Short- and long-horizon effects Dividend smoothing (Steady-state dynamics and the Gordon model) EX(4): Empirical implementation of the decomposition	LRR-3 PRED Emp Campb2008 Zi2021
		[Homework break]	
27 Oct	5	Homework discussion	
27 Oct	5	**Variance decomposition of returns** Campbell's variance decomposition of returns, and the role of "news" Estimating the model EX(5): Variance decomposition (news) with VAR Implications for asset pricing	LRR-4 NEWS Emp Campb1991 CaGiPo2013

03 Nov	6	**LRR asset pricing: Campbell's intertemporal CAPM** Foundations of intertemporal asset pricing (Epstein-Zin utility, budget constraint, consumption-wealth ratio) Intertemporal asset pricing with "news" about DR	LRR-5 AAP-ITA AAP-SDF Campb2003
10 Nov	7	**LRR asset pricing: Basic idea of Bansal-Yaron** Asset pricing with long-run consumption (growth) risk Integrating DR and CF news in pricing models Good and bad beta, and asset pricing	LRR-6 NEWS Emp CaVu2004
17 Nov*	8	**<u>Extra lecture</u>** **LRR asset pricing in detail** Bansal-Yaron model Pricing volatility risk Long-run productivity risk The Gordon-approach for extracting LRR factors	LRR-6 LRR Emp Bans2008 Zi2021
01 Dec*	9	**Reserve / Student presentations**	
08 Dec or 15 Dec		[Written exam]	

*Dates can be rescheduled if necessary

Only the major readings are indicated in this Table. Detailed and specific references can be found in the Lecture Notes (LRR) and the indicated references.

Readings

Major Handouts:

[LRR] Zimmermann, Heinz: "Long Run Risk in Financial Markets", Book Draft, Version 2022 (slightly revised), 122 p.

[PRED Emp] Predictability: Empirical Estimates

[NEWS Emp] Variance decomposition and "News": Empirical Estimates

[LRR Emp] Long Run Risk Pricing Models: Evidence

Additional references (only selected sections are relevant):

[AAP-ITA] Consumption, saving, and interest: The case of certainty (H. Zimmermann, Lecture Notes, Chap 1) → from Macro/Finance lecture

[AAP-SDF] SDF representation of asset pricing models (H. Zimmermann, Lecture Notes, Chap. 5) → from Advanced Asset Pricing lecture

Articles:

[Bans2008] Bansal, Ravi: "Long-run risks and risk compensation in equity markets." Handbook of the Equity Risk Premium (2008), Elsevier, Chapter 5

[Campb1991] Campbell, John Y.: "A variance decomposition for stock returns", Economic Journal 101 (1991): 157-179.

[Campb2003] Campbell, John Y. "Consumption-based asset pricing." Handbook of the Economics of Finance 1 (2003): 803-887.

[Campb2008] Campbell, John Y. "Viewpoint: Estimating the equity premium." Canadian Journal of Economics 41 (2008): 1-21.

[CaVu2004] Campbell, John Y. and Vuolteenaho, Tuomo: "Bad Beta, Good Beta", American Economic Review 94 (2004): 1249-1275

[CaGiPo2013] Campbell, John Y., Stefano Giglio, and Christopher Polk. "Hard times." The Review of Asset Pricing Studies 3 (2013): 95-132.

[LeR1984] LeRoy, Stephen F. "Efficiency and the variability of asset prices." American Economic Review (1984): 183-187.

[Zi2021] Zimmermann, Heinz. “Long-run implied market fundamentals: An exploration”, Journal of Investment Management (2021), forthcoming

Upgrade to 6 ECTS: Learning Contract

Interested students can upgrade this lecture from 3 ECTS to 6 ECTS; this requires a Learning Contract which must be completed online and submitted to the Studiendekanat.

The contract **is standardized** for all student in this lecture and includes the following items: (next two pages)

Universität Basel

Wirtschaftswissenschaftliche Fakultät

Universität Basel
Wirtschaftswissenschaftliche Fakultät
Studiendekanat
Peter Merian-Weg 6
Postfach
4002 Basel, Switzerland
T +41 61 207 33 01
F +41 61 207 13 16

studiendskanat-wwz@unibas.ch

The form for the Study Contract can be found at https://services.unibas.ch. Some of your personal data will appear automatically, other details must be entered into the form manually or using the drop-down buttons.

If you do not understand the following German text or have questions, please contact us.

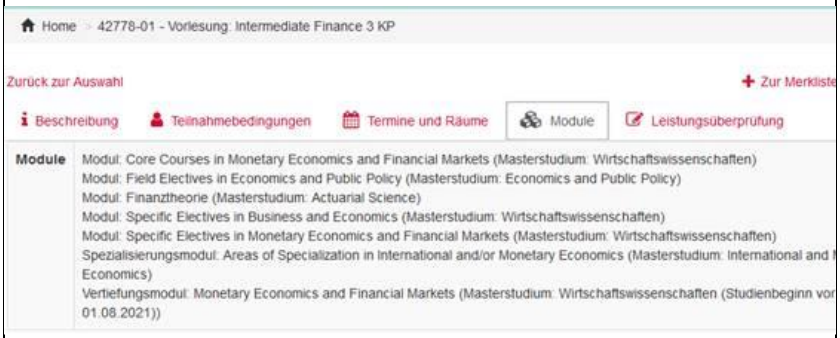
Studienvertrag (Learning Contract)

Mit diesem Studienvertrag/Learning Contract werden die Bedingungen zum Erwerb von Kreditpunkten ausserhalb des regulären Lehrangebotes im Voraus vereinbart.

Vereinbarung

Der Studienvertrag wird vom Studierenden online erfasst und durch das Erstellen digital an den Beurteiler/ die Beurteilerin weitergeleitet. Der/die Beurteilende prüft den Studienvertrag, weist ihn bei Unklarheiten zurück oder genehmigt ihn. Im Anschluss prüft die zuständige Unterrichtskommission den Studienvertrag inden Online-Services und genehmigt ihn resp. lehnt ihn ab. Die Bewertung erfolgt nach der Leistungserbringung online durch den Beurteiler/die Beurteilerin.

Matrikelnummer	*00-000-000*
Studierende(r)	*Muster, Petra*
E-Mail	*petra.muster@stud.unibas.ch*
Adresse	*xyz-Strasse 1, 4002 Basel*
Studium	Master Wirtschaftswissenschaften
Art der Leistung	Erweiterte Kompetenzen / Advanced Skills
Titel	Asset Pricing III
Titel engl.	Asset Pricing III

Übersetzung	
Inhalt	Die Vorlesung Intermediate Finance wird um einige Themen erweitert (siehe Syllabus) und der behandelte Stoff durch eine zusätzliche Hausarbeit methodisch vertieft und auf eine konkrete Problemstellung angewendet.
Beginn	22.09.2022
Ende	01.12.2022
Anzahl KP	3
Anrechnung in Modul	*Hier wählen Sie das entsprechende Modul Ihres Studiengangs aus. Beispiel: Wenn Sie im Masterstudium Wirtschaftswissenschaften (Studienbeginn vor 1.8.21) eingeschrieben sind «Vertiefungsmodul: Monetary Economics and Financial Markets»* *Die komplette Übersicht aller mögliche Module finden Sie im Vorlesungsverzeichnis:* 
Leistungsüberprüfung	Prüfung und Homework/Vortrag (die Prüfung findet im Rahmen der Asset Pricing II statt); Gewichtung: 50% Prüfung und 50% Homworks/Vortrag. Dies ergibt EINE Note, welche im Zeugnis 2-mal unter Asset Pricing II Asset Pricing III ausgewiesen wird.
Beurteiler/in	Heinz Zimmermann, heinz.zimmermann@unibas.ch
Bewertung	Benotung (6.0 – .0,0.1)
Nachb./ Wiederholung	Keine Nachbearbeitung oder Wiederholung möglich