

Venture Capital & the Finance of Innovation

Fall 2019 (PHL)

Professor David Wessels

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This course will focus on the primary activities performed by venture capital professionals, including how they raise capital, how they structure their funds, as well as how they select, fund, and exit high-growth privately-held companies.

- We start by outlining **how venture capital funds are organized**, how and from whom they raise capital, and in what type of firms they typically invest. A good portion of the section will **examine the risk return profile of venture capital** and whether venture capital “beats the market,” whether it lowers risk of the limited partner’s portfolio, and how the great uncertainty associated with growth firms should be priced.
- The **second section** of the course will examine corporate valuation and value drivers. Given the incredible uncertainty associated with high-growth companies, alternative methods such as **key value driver models and comparable transactions** must be employed to triangulate results. Special attention will be given to the valuation process for small, illiquid, high-growth companies versus mature companies. For instance, how do you bound reasonable estimates of revenue growth, operating margins, and capital productivity when little historical data is available?
- The **third section** of the course will examine valuation techniques necessary to **value complex securities** associated with venture capital and high growth companies. Preferred stock held by venture capitalist has conversion features that resemble a combination of debt and equity. Therefore, options models must be employed to determine their economic (versus fully-diluted) value.

Complementary Classes: The class will focus on the financial aspects of valuing and funding high growth companies. A **critical skill** to venture capital that we will cover *only briefly* is screening and selecting potential investments. To develop a well-rounded skill set, I recommend Entrepreneurship (MGMT 231/801) and Venture Capital and Entrepreneurial Management (MGMT 264/804).

Reading Material

The course will rely on a textbook and supplemental readings. The textbook can be purchased in the campus bookstore or online:

Venture Capital and the Finance of Innovation (2nd edition) by Andrew Metrick and Ayako Yasuda, 2011, John Wiley & Sons, Inc, NY.

The course will also rely on supplemental readings. Supplemental readings are meant to complement a lecture. Please note that the readings will not match the classroom content perfectly. Instead, they are meant to provide you with helpful language and context. Most readings are just a few pages.

Supplemental readings can be found on canvas under Files/Readings.

Reading	Name
Reading 1	NVCA Annual Report, Pages 5-9 and 48-59 (as helpful)
Reading 2	Evergreen Funds
Reading 3	Private Equity Performance: Pages 1791-1974
Reading 4	Thinking about ROIC and Growth
Reading 5	Calculating Burn Rates and Is My Startup Burn Rate Normal?
Reading 6	Why Unicorns are Overvalued
Reading 7	CooleyGo on down rounds
Reading 8	CooleyGo on convertible debt primer
Reading 9	CooleyGo on convertible debt caps

In-Class Requirements

Please bring three items to EVERY class: your name tent, the lecture's notes, and a basic calculator. As the semester progresses, please remain diligent. I tend to be relentless with those who come to class empty-handed.

Assignments & Grading

There will be three individual assignments (15% total), two group projects (25% total), and two exams (60%). For individual assignments, I expect you to work alone and hand in your own work. You can discuss class tools, but not the assignment. For group work, please self-select groups of between 3-5

people, no exceptions. If you have six people, create two groups of three. You can switch groups between projects, but this is NOT recommended. For classes with multiple sections, you can form groups across sections.

Class participation will not formally be scored, but students at the grading cutoffs will be evaluated for their ability to generate an active and positive class environment. The assignment/exam due dates and grading breakdown will be as follows:

	Assignment/Exam	Expected Due Date	Grade
1	Individual Assignment: Portfolio Review	9/16/2019	5%
2	Individual Assignment: LP/GP Contracts	9/25/2019	5%
3	Exam I (in class)	Thursday 10/3/2019	25%
4	Group Project: Strategic Assessments	10/21/2019	10%
5	Group Project: Private Company Valuation	11/4/2019	15%
6	Individual Assignment: Term Sheets	12/3/2019	5%
7	Exam II (in class)	Thursday 12/5/2019	35%

If necessary, superseding due dates will be posted to canvas. They will follow the schedule above unless we have not covered the relevant material. The exams are fixed and will not change. Please make the appropriate accommodations as we cannot accommodate alternative testing dates.

Teaching Assistants & Office Hours

We have four teaching assistants for the class. If you have questions concerning assignments or practice exams, please e-mail your primary TA first. If they are out of town, only then reach out to the other TAs. Again, all questions concerning assignments and practice exams will be redirected to TAs, so start there! If you have questions about the course notes or content beyond the class materials, please come see *me* during office hours. The TAs are:

9:00am Last Names (A-M): Terry Jo <joterry@seas.upenn.edu>

9:00am Last Names (N-Z): Christopher Mohr <cgmohr@wharton.upenn.edu>

10:30am Last Names (A-M): Saurin Patel <saurinp@wharton.upenn.edu>

10:30am Last Names (N-Z): David Pease <peased@wharton.upenn.edu>

Office Hours: The teaching assistants will hold office hours from **1-2:30pm on Mondays and 11:30-1pm on Wednesdays** in SHDH 2305. Professor Wessels will hold office hours **starting at 1:30pm on Tuesday** in SHDH 2438. Please send him a note to book a slot if you plan on attending <wessels@wharton.upenn.edu>.

Regrade policy. All regrade requests must be submitted in TYPE and emailed to your primary TA within 10 calendar days following the return of your graded work.

Academic Integrity

I expect you to follow Penn's code of academic integrity when completing problem sets, group work, and exams. Allegations of impropriety should be brought directly to me, which in turn will be referred to the University Honor Council. For more, see:

<https://catalog.upenn.edu/pennbook/code-of-academic-integrity/>

The most common violation is turning in another person's work, which results in a semester-long suspension by the University. This course is meant for you, make sure it reflects your contributions!

I look forward to meeting each one of you this semester! Best, Prof. Wessels.

Venture Capital and the Finance of Innovation

Course Schedule

Section	Week	Date	Note	Reading
Section 1: The Limited Partner's Perspective	1	8/27/2019	1 Introduction to Venture Capital	Reading 1
	2	9/3/2019	2 The Venture Capital Cycle	Metrick 1
		9/5/2019	3 Raising LP Capital: Partnership Compensation	Metrick 2
	3	9/10/2019	4 Theory: Risk and Return for LPs	Metrick 4.1 - 4.2
		9/12/2019	5 Theory: Risk and Return for Founders	No Reading
	4	9/17/2019	6 In Practice: Does VC beat the market?	Metrick 3.1 and 4.3
		9/19/2019	7 Choosing amongst funds: Performance Metrics	Metrick 3.2
	5	9/26/2019	8 Choosing amongst funds: Persistence *	Reading 3
Section 2: Valuation and Analysis of High Growth Companies	6	10/1/2019	9 Screening Startup Opportunities	Metrick 7
		10/3/2019	10 Key Value Drivers: Evaluating High Growth Companies	Reading 4
	7	10/8/2019	n/a Exam I	n/a
		10/10/2019	11 Key Value Drivers: Cash Burn	Reading 5
	8	10/15/2019	12 Keeping it Simple: Startup Valuation in Practice (Virtual)	Metrick 10
		10/17/2019	13 Late-stage Valuation	Metrick 11
	9	10/22/2019	14 Using Multiples to Triangulate Value *	Metrick 12
Section 3: Term Sheets, Capital Structure & Financing Growth		10/24/2019	15 Term Sheets: Valuation and Employee Options	Metrick 8
	10	10/29/2019	16 Term Sheets: Preferences and Other Key Items	Reading 6
		10/31/2019	17 Term Sheets: Capital Structure	Metrick 9
	11	11/5/2019	18 Term Sheets: Down Rounds	Reading 7
		11/7/2019	19 Fundamentals of Options Pricing	Metrick 13
	12	11/12/2019	20 Valuation of Series A: Using the Model	Metrick 14, 17
		11/14/2019	21 Valuation of Series A: How VCV Works	No Reading
	13	11/19/2019	22 Valuation of Series B	Metrick 15.1-15.2
		11/21/2019	23 Series C and Beyond *	Metrick 15.3-15.5
	14	11/26/2019	n/a Exam II	n/a
	15	12/3/2019	24 Angel Financing	Readings 8 & 9
		12/5/2019	n/a Semester Review	n/a

** I prefer to let the natural flow of the class dictate pace. If we fall behind, the lecture on individual fund performance, using multiples, or Series C financing will be shortened or eliminated.