

**Innovative Finance for Development:  
Sustainable Finance and Impact Investment  
Fall Semester 2024  
University of California-Berkeley DEVP 296  
Hebrew University MBA 55721 Global MDP Students  
(Global MDP Students-by invitation)**

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**CLASS Session:** Mondays, 18:30-20:30 (Jerusalem) 8:30-10:30 (Berkeley)  
Final Project Concept Note Consultation Sessions and Presentation

**Zoom:** **Join Zoom Meeting**  
<https://berkeley.zoom.us/j/97455652533?pwd=XF7z5HgSa9OhERoyT4to4oXHMBfYs5.1>

**Meeting ID: 974 5565 2533**  
**Passcode: 095253**

## DESCRIPTION

This course will focus on the means and methods of finance applied to social, economic, and environmental challenges facing developing economies. Financial innovations give rise to **new intermediaries** (community venture capital, permanent capital facilities, revolving loan funds, social investment banks, business development companies, venture investment trusts etc.), **new types of intermediaries** (community venture capital, permanent capital facilities, revolving loan funds, social investment banks, business development companies, venture investment trusts etc.), **new types of instruments** (structured credit, blended finance, SME and microfinance, social, environmental and development impact bonds, sustainability-linked, social and green bonds, diaspora bonds, catastrophic risk bonds, royalty trusts, community investment notes, and risk pooling finance mechanisms and facilities), and **new services, platforms or techniques** (ETFs, AMCs, impact investing, public-private partnerships, guaranteed offtake agreements, financial intermediary facilities, credit enhancements, risk syndication, international finance facility for immunization, product development partnerships, supply-

chain financing) to create jobs, build communities, and enable capital formation accelerating inclusive economic growth. This survey course on financial innovation is followed by an applied project development seminar in the Spring Semester (DEVP 290 and MBA 55680). This enables us ultimately to embed and link single-point solutions into system and portfolio-based financing models to finance sustainability transitions.

This course provides a survey of development finance theory and practice, including case study applications of innovative finance policy, programs, projects, and securities/financial product design. The final assignment is to prepare a project concept note for a sustainable finance initiative that may be subsequently pursued in a second semester research seminar to prepare a project development plan for implementation for potential field assignments for those interested into a deeper dive into development finance fieldwork or related capstone projects in participating public policy, business, engineering, and economic graduate and career training programs.

## OBJECTIVES

Our class sessions will survey the application of innovative financing emerging through new products and services, new processes and operations and organizational forms in addressing problems as diverse as entrepreneurial finance, renewable energy, environmental finance, global health, accelerating medical solutions, regional development, affordable housing, urban revitalization and infrastructure. Through case studies and reviews of financial policies, programs and product innovation, and a deep dive into project finance mechanics, students will discover why capital structure matters in aligning diverse interests into new business models for sustainable finance and impact investing. Students will work through problem sets for innovative financing structures for development projects and enterprises. Students will acquire and apply data gathering, economic, and financial analytical skills to identify specific market failures in developing economies enabling them to apply appropriate financial tools to bridge capital gaps for project and enterprise finance. This would include the ability to identify key performance indicators to reach innovation-led growth targets (e.g., increased crop yields, reduction of disease incidence, lower credit access costs, lower weighted average cost of capital), choose a coherent, time and risk-balanced portfolio of development initiatives required to meet a measurable and tangible development target (e.g., prevention, diagnostics, treatment for global health; job creation and sustainable income and wealth formation); differentiate business, market and technological opportunities for a development target (e.g., on-grid, off-grid, and/or under grid renewable energy); evolve, accelerate, extend and scale sustainable development business models; and identify criteria for replication (capitalizing external networks, motivate and reward repeating, positive-sum economic development strategies). We will discover why capital structure matters in aligning diverse interests into new business models for social and economic change to address [Sustainable Development Goals](#) for 2030. Students will research practical applications to financing challenges for economic development.

## REQUIREMENTS:

All readings required are designated by “\*\*\*”. Readings marked with “\*” are case studies or research that might be presented in class. Together with attendance at the lectures and participation in structured discussions they will provide students with a tool kit to develop a concise **proposal** focused on financing a targeted development impact (the course’s

final project concept note). The work product for the end of the semester project will be a proposal for the application of an innovative finance product(s) to a project or program that would target a specific sector (agriculture/food, health, energy, health or environmental), geography (developing/frontier economy); and/or technology transfer or development application related to the UN's [sustainable development goals](#). This will require a description of the proposed project (or program or policy) project concept note including:

- milestones,
- project targets,
- outputs/inputs (including financial, technology and intellectual property inputs), i
- outcomes (identification and quantification of social, economic and/or environmental outcomes),
- proposed capital structure, sources and uses of funds and,
- a targeted range of return on investment and social/environmental impact (including identification of potential avoided costs).

This would include the identification of:

- specific financial tools (bonds, notes, guarantees and credit enhancement, grants, performance-based contracts, revolving loan funds or structured finance product, etc.);
- structured or blended finance capital stack and how they might be applied to serve the development target (common/preferred equity, mezzanine/subordinated debt, senior debt, and related credit enhancements/grants and other characteristics including convertibility, options, rights, warrants, etc.)

Specific mapping described in the **Project Concept Note** specify SDG goals and targets addressed (relevant for projects inclusion into potential pooled securities and their design).

Themes for these project proposals could include increasing food and agriculture (agricultural productivity, improve food quality and sustainability), global health (including diagnostics, primary care and community projects, treatment modalities and preventive medicine; bio based and sustainable solutions), energy (low carbon projects and climate change adaptation), and environmental finance (sustainable water, land and forest management, conservation and ecosystem services, biodiversity, drought prevention, carbon projects, etc.).

Projects design (and the financial instruments designed for them) and could include:

- **SME finance for enterprise development** (compare and contrast specific private equity, revolving loan fund models, structured finance solution etc.);
- **Environmental or energy infrastructure** (use modern finance mechanisms such as risk pooling and risk transfer to create climate response systems to protect food security, technology transfer for water technology, water quality/recycling, distributed water treatment and production or on- grid, off-grid, or under-grid renewable energy project);

- **Agricultural or food innovation** (plant or soil science technology innovations, post-harvest, or supply chain finance models utilizing agricultural pull-mechanisms);
- **Global health innovation** (development impact bond, product development partnership, advanced market commitment applied to a vaccine, treatment modality, or preventive measure).

These project proposals would address a prospective practical development project and explicate the deployment of a development finance innovation(s) hopefully through field work during or following the course. Alternatively, this same work product in the course could be the basis for further capstone project integrating knowledge and skills from this and related courses in business/finance, engineering, public policy, and economics to enable innovative solutions for real world problems in economic development.

The project proposal would address how innovative finance could design a capital structure for a project or development target that mobilizes:

- A. new pools of private and public revenue streams.
- B. new revenues options (e.g., tax, charges, fees, bond sales);
- C. new incentives (frontloading and debt-based instruments, philanthropic/government guarantees, public-private partnerships, insurance, and other market-based mechanisms).

These projects can be completed as individual (or teams of 2-3 students reflecting the team members' increased level of effort to meet this assignment's objective).

Guidelines and an example of such a project concept note will be discussed at our Project Finance Mechanics Workshop held on **September 16 (UC-Berkeley)** and **February 10 (Hebrew University of Jerusalem)**. Other Global MDP class participants can join subject to their term scheduling if they are enrolled in the course---please send in your detailed information, email, and program to Kritka Kandel, Graduate Student Instructor.

Through the projects, students will demonstrate their ability to:

- Design and construct an innovative finance application (for either a proof of concept or beta site project) in a developing economy;
- Measure, analyze and report development impacts of an innovative finance project;
- Identify and develop how a development impact investment would benefit and expand capital access through the creative use of innovative financing tools;
- Assist a high-impact project to access flexible market and below-market financial tools;
- Identify how to structure the transaction and identify potential interested partners with aligned interests in the proposed project.

#### **Assessment:**

- Class attendance: 20%
- Case Study/Research Presentation: 20% (per registration for presentations assignments) Final Project Concept Note: 60%

## EVALUATION

### Critical Dates:

- **September 30:** U C -Berkeley Registration for case study/research class presentation/ Hebrew University of Jerusalem: **November 18** . This course requirement should inform the Final Project Concept Note and based on any case study or research marked by “\*” in the readings (or approved by instructor).
- **October 21:** UC-Berkeley Project Concept Note (PCN) topics and one page outline (covering points of requirements as outlined in posted Bcourses ppt)/ HUJI/ Global MDP: **December 1**.
- **TBD:** In-class presentations of Project Concept Note (powerpoint presentation)
- **December 19:** Final Project Concept Note Due (UC-Berkeley)/ **January 25** (Hebrew University of Jerusalem) (Global MDP Teams can present subject to their start date of the course)

### 1) Final paper-Project Concept Note

#### Key reading links to prepare for your project concept note :

[“High Level Mapping to SDGs: Green, Social and Sustainable Bonds.”](#)(2023) and [Working towards a Harmonized Framework for Impact Reporting](#) (2022), International Capital Market Association.

Impact Investor, [Guide 2024 Generating real-world impact](#), Investments and Pensions-Europe, 2024.

[Concept Note for Sustainable Infrastructure](#), Duke University, Nicholas Institute, July 2020

How to Write a Concept Note: A Step-by-Step Guide: [here](#).

[Developing a Project Concept Note: Practical Manual](#), European Union, 2024.

#### Requirements:

- Students are requested to choose a topic and submit a one-page outline prior class on (September 30—UC-Berkeley/ November 18: Hebrew University of Jerusalem)
- PowerPoint presentations and discussion of each Project Concept Note (done as individual or group no great than 3) will be in a special class review session to be scheduled
- Subject to approval of the topic and the outline, students are required to compose 15-20 pages (double-spaced) and submit the final paper no later than **(UC-Berkeley: October 21/ Hebrew University of Jerusalem: December 1)**
- Late papers will not be accepted without prior approval.

The project concept note will be based on diagnostic questions the students wish to pursue focused upon a related to one more specific Sustainable Development Goals related to specific impact measurements. The objective is to develop a feasible and investable development project using the financial toolkit presented in the course work

and in research and case studies discussed in the class and potentially eligible to be included in a social, health, or environmental impact bond or a pooled security for sustainability, social and green bonds under the criteria of the **International Capital Markets Association** and other related capital markets financial innovation firms or professional financial services agencies and internationally recognized reporting and regulatory disclosure reporting frameworks (GRI, IIRC, TCFD, CDP, UNGC, ISSB).

These project concept could be considered for possible further work in a class offered in the Spring do prepare the project concept note into a project implementation plan for Fieldwork fellowships applications by eligible students at the Milken Innovation Center in conjunction with the Blum Lab for Developing Economies at the Jerusalem Institute or existing development finance field sites by other partners in the field in Africa, India, or Latin America as part of our ongoing collaboration between: [UC-Berkeley and the Jerusalem Institute-Milken Innovation Center/Hebrew University of Jerusalem School of Business Development Finance Practice Program](#). Students who complete successful field assignments as Fellows will receive a graduate Development Finance Practice certificate from the Hebrew University of Jerusalem School of Business.

- The project concept note will be based on diagnostic questions the students wish to pursue focused upon a related to one more specific Sustainable Development Goals related to specific impact measurements.
- Their project will need to address the following questions:
  1. What are the financial bottlenecks for the SDG challenges?
  2. Why isn't funding availability? Does the market work?
  3. If not, why not?
  4. Who could fund and what do they care about?
  5. What financial tools can help catalyze that funding through a development capital structure stack or design?

**Additional questions that will need to be addressed in each project implementation proposal would also include:**

- **Project:** What is the project proposing to do?
- **Opportunity:** What need is it meeting? Who is interested in the success of this project? Who are the stakeholders?
- **Team:** Who is doing it? What is their experience, expertise, roles?
- **Market:** Who is the customer? What are the marketing channels to reach the customer?
- **Costs:** How much does it cost to build? To operate?
- **Capital Structure:** How will it be financed? By whom and under what terms and conditions? What are the returns to each investor?
- **Plan:** What is the work plan and milestones?
- **Risks:** What are the risks and how will the risks be mitigated?
- **Outcomes:** What are the outcomes and how will they be measured?

**Students will need to address these issues in their proposal:**

- Different innovative financing tools and resulting instruments for potential impact investments;
- Methods of risk mitigation;
- Different models for structuring impact investment funds, blended finance models and capital structures, and pooled securities to develop the financing pipeline;
- Examine use of catalytic first loss models, grants, loans, equity, etc. that can be mobilized

for impact enterprise and project finance addressing development goals.

- Creative ways to target small and middle-size enterprises and projects through pooled securities, revolving loan facilities, fintech, and alternative risk assessment and management models.

- 2) **Completion of case study write-ups and reading presentations for class discussion: You will be asked** to review and present case studies and/or readings related to the course from those listed below. Students will be asked to choose their presentation groups by the end of Class **Monday, December 19, UC-Berkeley/ January 25, Hebrew University of Jerusalem Global MDP**. This summary presentation and related class attendance and engagement in lectures and questions will comprise the second area of course evaluation. **(20%) Please note presentation sign-up page on the course website on B-Course**

**Course Management:** via B-Courses - UC-Berkeley—access link will be provided to all enrolled students. Course is open for participants from Hebrew University of Jerusalem (and partnering universities) and the Global Association of [Master's in Development Practice](#) (MDP) Programs. Global MDP Participants can register for the course (3 Credits transferrable) and participate on either the UC-Berkeley track (**September 9- December 9**) or Hebrew University track (**November 4-February 3**) subject to their curriculum schedules. Students successfully completing the Fall Course can apply for Spring Project Development Seminar and eligible for additional 3 transferrable Credits.

#### COURSE UNIT OVERVIEW\*

\*Instructor Overview/Lecture (either synchronous or asynchronous) will precede each Guest Lecture or case study presentations as noted below.

#### I. Introduction to Finance Toolkit and Innovative Finance (**September 9**)

#### II. Project Mechanics Lecture and Workshop on SDGs-- (**September 16**)

**Practitioner Guest Lecture:** [Steven Zecher](#), Project Director, Milken Innovation Center-Jerusalem Institute

This week will be devoted to background and development of the Project Development Concept Note for the final work product of the course---linking development finance projects to programs to policies to capital market transactions.

#### III. Building Solution Sets and Project Pipelines for Sustainable Development (**September 23**)

#### IV. Entrepreneurial Finance (**September 30**)

**Practitioner Guest Lecture:** [Michael Lustig](#), Impact Investor and Educator, Adjunct Professor of Finance, NYU Stern School of Business/former Managing Director, Structure Credit, BlackRock

**Themes in related readings:**

- Lifecycle of Finance
- Business Finance and Capital Structure
- Equity, Debt finance, and Hybrid Debt Instruments
- SME Finance

**V. Impact Investment (October 7)**

**Practitioner Guest Lecture:** [Aya Navon](#), Head of Research, Israel Forum for Impact Investment/Global Steering Group for Impact Investment

**Themes in related readings:**

1. Pay for performance contracting
2. Full-spectrum Asset Class Product and Program
3. Risk-Return-Impact: Metrics

**VI. Climate Finance (October 14)**

**Practitioner Guest Lecture:** [Frederic Samama](#), Head of Strategic Development, S&P-Sustainable 1

**VII. Energy Transition Finance (October 21)**

**Practitioner Guest Lecture:** [Jake Cusack](#), Co-Founder and Managing Partner, CrossBoundary Group

**VIII. Development Finance—Food-Water Nexus (Case Study Applications) (October 28)**

**Practitioner Guest Lecture:** [Simon Winter](#), Global Executive Director and [Baskar Reddy](#), Executive Director-India, Syngenta Foundation for Sustainable Agriculture

**IX. Framing Finance: Lessons Learned from [New \(Endogenous\) Growth Theory](#) and Economics of Climate Change (November 4) (Hebrew University)**

**X. Structural Changes in Capital Markets and Development Finance (November 11)**

1. Global Trends
2. What is Financial Innovation?
3. From Structured to Blended Finance
4. Why and How does Capital Structure Matter?



## XI. Financing Ideas: Disruptive Science and Tech Finance (November 18)

**Guest Lecture:** [Prof. Andrew Lo](#), MIT Financial Engineering Lab  
“Research-Based Obligations and Lessons from Hollywood””

1. From Venture Capital Models to Research Bond Obligations
2. Disruptive Technologies and the Sustainable Development Goals

## XII. Financing Global Health (November 25)

**Practitioner Lecture:** [Caitlin MacLean](#), Innovative Finance, Milken Institute

## XIII. Infrastructure and Urban Revitalization (December 2)

**Practitioner Lecture:** [Dan Carol](#), Finance, Center for Financial Markets, Milken Institute

## XIV. Project Concept Note Presentations (UC-B and Participating Global MDP Campuses: December 9) ---UC-Berkeley Semester Ends

**N. B. (Hebrew University Track and Participating Global MDP Campuses: In-Class Review of Sections II-XII in continuing weekly session through February 3, 2024).**

**Project Concept Presentations on January 27 and February 3, 2025—Hebrew University and Participating Global MDP Campuses Semester Ends.**

### Course Assignments and Readings

Reference Resource throughout course: [Milken Institute 5-Minute Finance](#)

The course presumes some basic knowledge of economics and finance. Please use [our 5-Minute Finance app](#) above for review as well as the Glossary and Appendix link supplied as part of the course.

Remedial review and terms (present value, compound interest, understanding capital structure, investment and consumption, Black-Scholes Formula, forward and future contracts, etc.) are easily accessible at [Kahn Academic Finance and Capital Markets](#).

Another helpful financial dictionaries include: [Harvey’s Hypertextual Finance Glossary](#), [Glossary for Financial Innovation \(European Banking Authority\)](#), [Fintech and the Future of Finance Glossary \(World Bank\)](#), [Sustainable Finance Glossary \(Switzerland\)](#), [ABCs of Innovative Finance \(Convergence\)](#), [Impact Investing Glossary \(Impact Investing Hub\)](#).

And the introduction to options terminology: CME Institute Glossary: [here](#).

### **DETAILED READINGS Per Section of Course:**

**\*\*Required Readings for Lectures**

**\*Recommended for Student Presentations for Case Study/Research Review (individual or group presentation informing subject for project development concept note)**

## I. Introduction to Financial Toolkit and Innovative Finance for Development (September 9)

1. \*\*Yago, Glenn and Steven Zecher, “[Innovating Sustainable Finance for Development Impact](#),” in Paul Walsh and Ciara Whelan (eds.), *Transforming our World: the UN 2030 Agenda for Sustainable Development*, London: Elgar, 2023.
2. \*\*Key Resource: Anja-Nadine Koenig, Chris Club and Andrew Apampa, [Innovative Development Finance Toolbox](#), KFW, October 2020. (Parts I-III, Terminology and Key Concepts, InnoFins Objectives and Sectors---Reference Factsheets: *Structured Funds, Results-based Finance, Outcomes-Based Finance, Guarantees, Bonds, Securitization*).
  - a. See also, the UNDP **Sustainable Development Goals Acceleration Toolkit**: [here](#).
3. \*\* Allen, Franklin and Barbalau, Adelina, [Security Design: A Review](#) (January 26, 2024). <http://dx.doi.org/10.2139/ssrn.4258499>
4. \*\*Allen, Franklin and A. Babalau, E.Chavez, and Frederica Zeni, “[International Business and the Challenge of Financing a Just Climate Transition](#),” AIB Fellows Eminent Scholar Award Lecture, Academy of International Business Conference, July 8, 2023, Warsaw, Poland
5. \*\*Key Resource: [Portfolio Default Rate Analysis](#), International Finance Corporation, March, 2024.
  - a. This is a key report in casting the importance of economic development and empirically examining the difference between perception and reality of risk management for investment in developing economies. This GEMS (Global Emerging Markets Risk Database Consortium) data base is a key resource of understanding recovery rates for private and sub-sovereign borrowers in emerging markets ([here](#)).

## II. Project Mechanics Lecture and Workshop on SDGs (September 16)

### Practitioner Guest Lecturer:

### Steven Zecher, Project Director, Milken Innovation Center-Jerusalem Institute

This week will be devoted to background and development of the Project Development Concept Note for the final work product of the course---linking development finance projects to programs to policies to capital market transactions.

### Key background pre- readings for this session are:

1. \*\*Godnar, Gordon and B. Comer, [Project Finance Teaching Note](#),” Wharton School, University of Pennsylvania, 1996.
2. \*\*Huxley, Joe, “[Value Capture Finance, Making Urban Development Pay Its Way](#),” Urban Land Institute, 2009.
3. \*\*Ian Thomson, “[Innovative Ways to Finance Sustainability Projects](#),” Financial Management, July 18, 2023.
4. [The ABCs of Asset-Backed Securitization](#), Guggenheim, 2024
5. \*\* Dovrak, Paul, “[Put a fence around It: Project finance explained](#)” April 2016.
6. \*\*[New Perspectives on Results-Based Blended Finance for Cities: Innovative](#)

[Finance Solutions for Climate-Smart Infrastructure](#), International Bank for Reconstruction and Development/World Bank 2019.

### **Key Templates for designing Project Concept Notes and Project Development Plans—Open Source Access for Students**

7. Download for Blended Capital Structure Hurdle Rates of Return, Milken Innovation Center (available on B-Course website)
8. Download for Capital Structure Strategies, Milken Innovation Center (available on B-Course website)
9. Download for Calculation Examples, Milken Innovation Center (available on B-Course website)
10. Download for Examples and Illustrations, Milken Innovation Center
11. [Download the Environmental and Social Management System \(ESMS\) template to support mini-grid development in Africa](#), Cross Boundary Access, June 19, 2024.
12. Download project financing term sheets used to finance over \$80m of minigrids in Africa, Cross boundary Group, January 24, 2024 ([here](#))
13. [Download template term sheet for operating service agreement](#)
14. [Download template term sheet for purchase and sales agreement – asset transfer](#)
15. [Download template term sheet for purchase and sales agreement – share purchase](#)
16. [Download template project finance financial model](#)

#### **Videos to watch:**

[How to use the Impact Linked Finance Calculator](#), Swiss Agency for Development and Cooperation, March 2023. For more information on calculator and download, see: [here](#).

[Impact-Linked Finance as Catalytic Capital](#), Bjoern Struwer, Roots of Impact, 2023.

### **III. Building Solution Sets and Project Pipelines for Sustainable Development (September 23)**

1. \*\*Allen, Franklin and Yago, Glenn. *Financing the Future: Market-Based Innovations for Growth*. Upper Saddle River, New Jersey: Pearson/Wharton School Publishing, 2010:
  - b. Chapter 1: The Evolution of Finance;
  - c. Chapter 2: A Framework for Financial Innovation: Managing Capital Structure.
2. \*\*Outcomes-Based Project Finance Toolkit (focus on technical guidance for social impact bonds and Value-for-Money (VfM) contracts: [here](#)).
3. \*\* Humphrey, C. (2023) [Tapping the potential of borrower led multilateral development banks](#). ODI Working paper. London: ODI.
4. \*\*[Models for Financing an Environmentally Sustainable Business Transition](#),” Financial Innovations Lab, Milken Institute, 2021.
5. \*\*[“How to Mobilize Private Investment at Scale in Blended Finance”](#),” Convergence and DFID Impact Programme, April 8, 2020
6. [“Scaling Up Blended Finance in Developing Countries”](#), OECD, 2022.

7. Homi Kharas and Charlotte Rivard, "[Financing for sustainable development is clogged.](#)" Brookings Blog, May 11, 2022.
8. Chetty, Raj, et.al., "[Social Capital I: Measurement and Associations with Economic Mobility](#)," Nature, 608/7291: 101-121 (August 2022).
9. Convergence Blended Finance (2023). [Best Practices for Donor Governments Engaging in Blended Finance](#). Convergence Report.
10. "[Productive, Sustainable and Inclusive Investment: 2022-26 Technical Strategy](#)," British International Investment, 2022.

### **Videos to Watch:**

Milken Innovation Center-Blum Lab for Developing Economies-Jerusalem, [How do we do financial field work together](#)

Hans Rosling, [Global Population Growth](#)

[Financial Innovation Labs: Bridging Funding Gaps, Solving Global Challenges](#), Milken Institute

- See further information on designing financial innovation solutions through projects, programs, and products through this process of bringing people, projects and capital together through our Labs:
  - Milken Institute:
  - [Financial Innovations Labs](#)
  - [Alumni Perspectives on Capital Markets Program](#)
  - Milken Innovation Center:  
<https://milkeninnovationcenter.org/>

## **IV. Entrepreneurial Finance (September 30)**

### **Practitioner Guest Lecture:**

**Michael Lustig, NYU Stern School/ Impact Investor and Educator; Former, Managing Director, Structured Credit, BlackRock**

1. \*\*Allen, Franklin and Yago, Glenn. "Financing the Future: Market-Based Innovations for Growth". New Jersey: Wharton School Publishing, 2010: Chapter 3: Innovations in Business Finance Appendix: The Black-Scholes Formula
2. \*\*"[Blended Finance in Sub-saharan Africa: SME Financing](#), Enhanced Data Brief, July 2024.
3. \*\* Allen, Franklin, Careletti, Elena, et.al., "[Improving Access to Banking: Evidence from Kenya](#)" Review of Finance, 2020:1-40 , BAFFI CAREFIN Centre Research Paper No. 2018-104,
4. \*\* [IFC SME Ventures: Investing in Private Equity in Sub-Saharan African Fragile and Conflict-Affected Situation](#). IFC and Cross-Boundary Ventures, October 2018.
5. William Janeway, Ramana Nanda, Matthew Rhodes-Kropf, "[Venture Capital Booms and Startup Financing](#)", Working Paper 21-116, 2021.
6. Parvez, Al-Amin, et.al., "[Fintech and Inclusive Growth: Evidence from 25 Asian Developing Countries](#)," Asian Development Bank Institute, Workpaper Series, No. 1385 (May 2023).

7. Yago, Glenn, "[Development Finance Case Studies: Innovative Finance for Sustainable Development Goals](#)," Milken Innovation Center-Jerusalem Institute, 2018: 1: Aspada, India & Bangladesh
8. "[Stimulating Investment in Emerging-Market SMEs](#)," Financial Innovations Lab Report, Milken Institute, 2009. See outcome of this Lab in S. Hinton, "India Delivers a Case Study in Successful Impact Investing, 2019: [here](#). Also, Harvard Business School Case Study: [here](#)

**Key Videos to watch:**

**Raman Nanda, "[Entrepreneurs as Scientists: Understanding and addressing financing frictions in Deep Tech](#)," Imperial College London Business School, March 24, 2021**

**Aspada News Story, [Young Turks](#) Further portfolio company videos: [here](#).**

**V. Impact Investment: Social Impact Bonds and Beyond  
(October 7)**

**Practitioner Guest Lecture:**

**Aya Navon, Impact Investment and Blended Finance, Israel Forum for Impact Investment/Hebrew University**

1. \*\*Intro Reading: Sir Ronald Cohen, Impact: Reshaping Capitalism to Drive Real Change, London: Ebury Press, 2020. [Chapters 2 and 3: 34-85](#)
  - a. **Review this website on current status of Social Impact Bonds** (pay for results contracts for reducing social risks): July 24 Impact Bond Landscape ([here](#)).
2. \*\*Andrew Lo and Tuixun Zhang, "[Quantifying the Impact of Impact Investing](#)," MIT Laboratory for Financial Engineering. 18 April 2023.
3. \*\*Verlarde, J., et.al., [Beyond impact bonds: varieties of outcomes-based contracts around the World](#), 20 April 2024.
  - a. N. B.—Check this site for relevant applications: [International Network for Data on Impact and Government Outcomes](#) (INDIGO), Government Outcomes Lab, University of Oxford, April 2024.
4. \*\*[Evaluating the Impact of Blended Finance: Convergences' Case Study Portfolio Revisited](#)," Learning Report, May 2023.
5. [Emily Gustafsson-Wright and Elyse Painter, A Review of Outcomes-based Financing in 2022 and Beyond](#), Brookings, January 2023.
6. Builders Initiative, Social Finance, [Breaking Barriers: A Practical Guide to Unlocking Foundation Endowment for Missions and Returns](#).
7. Lee, Christopher, Ragini Chawla and Aron Betru, [Priming SDG Markets: Can International Donors and Implementers Create an Impact Investment Pipeline?](#), Milken Institute, 2020.
8. **Key Resource:** Financial Times/ Global Impact Investing Network (GIIN): Publish list of 118 impact investors and AUM (2024): [here](#).
9. \***Case Study:** Emily Gustafsson-Wright, et.al., " From Evidence to Scale: Lessons Learned from the Quality Educational India Development Impact Bond," Brookings Center for Universal Education, November 2022.

10. \*Case Study: [Impact MuniBond: Social bond to tackle poverty and unlock growth in Philadelphia](#), Impact Alpha, May 25, 2023.
11. \*Case Study: [Refugee Impact Bond](#), Convergence, February 2023.
  - a. Key Resource: Further Case Studies in-depth case studies of impact bonds and other outcomes-based approaches can be found at the Government Outcomes Lab, Oxford University: [here](#).

### Measuring Impact:

1. [Developing DFC’s New Development Performance Measurement System: Impact Quotient \(IQ\) Indicators](#), U. S. International Development Finance Corporation, 2020. See also: [here](#).
2. Ronald Cohen and George Serafaim, “[How to Measure a Company’s Real Impact](#),” Harvard Business Review, September 3, 2020. (see Video below)
3. \*Case Study: [Practical Impact: GIF’s approach to impact measurement](#), Global Innovation Fund, June 2019.
4. \*Case Study Addy, Chris, et. al., [Calculating the Value of Impact Investing](#), Harvard Business Review, January-February, 2019.
  - a. See also Impact-Adjusted Accounts Framework website: <https://impacteconomyfoundation.org/impactweightedaccountsframework> (2024).
  - b. See also: Bridgespan Group, [Impact Investing: Measuring Impact and Impact Multiple of Money](#): [here](#).
5. \*\*Key Resource: [Technical Guidance](#), Government Outcomes Lab, Oxford University, 2024.
6. \*\*Key Resource: [Scaling Up Impact: Mainstreaming Initiative](#) focused on ensuring available finance is deployed for sustainable impact at optimal scale. Case Studies: [here](#).

### Videos to Watch:

1. Toby Eccles, [Investing in Social Change](#)
2. [Measuring Real Impact: An Overview of the Impact Weighted Account Initiative](#) (Sir Ronald Cohen, GSG Impact; Prof. George Serafeim, Harvard Business School; Quyen Tran, Blackrock)
3. [What’s Next for Impact Investing in Africa](#), Milken Institute Global Conference, 2023.

## VI. Climate/Environmental Finance (October 14)

**Relevant Weblink for this section: Environmental Finance ([www.environmental-finance.com](http://www.environmental-finance.com)) UN Environment Program-Finance Initiative (<https://www.unepfi.org/>)**

1. \*\*[“What Gets Measured Gets Finance: Climate Finance Funding Flows and Opportunities](#), Rockefeller Foundation and Boston Consulting Group, November 2022.
2. \*\*[Fostering Effective Energy Transition](#), Accenture World Economic Forum, Insight Report, June 2024.
3. \*\*Barbalau, Adelina and Frederica Zeni, “[The Optimal Design of Green Securities](#),” SSRN Working Paper, October 6, 2023.

- a. A Policy Brief based on this important technical paper is: Barbalua, A. "[Reducing Carbon using Regulatory and Financial Market Tools](#)," E-Axes Forum October 30, 2023.
4. \*\*Giglio, Steano, Bryan Kelley and Johannes Stroebe, [Climate Finance](#), Annual Review of Financial Economics, Econ. 2021:13-15-32.
5. Wharton, Kate, Jake Cusack, and Matthey Tilleard, "[Unlocking private capital for nature-based solutions in emerging and frontier markets](#)," Crossboundary, August 2021.
6. \*Case Study: Enrico Biffis, et.al., [Forestry-Backed Assets Design](#), Imperial College Business School, Singapore Green Finance Center, December 2022.
7. \*Case Study: [Fossil Fuel Phase-out Requires Food Systems Transformation: Link between food systems, energy, and climate](#), Dalberg, 2024.
8. \*\*Allen, Franklin and Yago, Glenn. Financing the Future: Market-Based Innovations for Growth. New Jersey: Wharton School Publishing, 2010:
  - a. Chapter 5: Environmental Finance: Innovating to Save The Planet
9. \*\*[World Bank Outlook 2050: Strategic Directions Note: Supporting countries to Meet Long-Term Goals of Decarbonization](#), 2020: 48-78 (Advancing Cross-Cutting Solutions---focus for project implementation plans).
10. Bolton, Patrick, Z. Halem, and M. Kacperczyk, [The Financial Cost of Carbon](#), Journal of Applied Corporate Finance, 11 June 2022: 17-29.
11. \*\*Bolton, Patrick, et.al., [The Green Swan: Central banking and financial stability in the age of climate change](#), Bank of International Settlements, January 2020: 1-20;47-64.
12. \*Case Study: Bolton, Patrick, Xavier Musca and Frederic Samama, "[Global Public Private Investment Partnerships: A Financing Innovation with Positive Social Impact](#)", Journal of Applied Corporate Finance, 32/1 (Spring 2020).
13. \*Case Study: [Managing Climate Risk in the U. S. Financial System, U. S. Commodity Futures Trading Commission](#), 2020.
  - a. Litterman, Bob, "[A Pragmatic Approach to Climate Change](#)," April 19, 2016 (Litterman was the Chairman of the Committee the above report.
14. \*Case Study: "[Converting Emerging Markets to Green Finance: Amundi and the IFC](#), Imperial College Business School, March 2020.
15. Case Study: [Frontier Climate: Advance Market Commitment to Accelerate Carbon Removal](#)," 2023.
16. Case Study: [DC Water Environmental Impact Bond](#), Goldman Sachs/Calvert Foundation, 2016
17. Case Study: Rose, Adam and Dan Wei, "[Impacts of the Property Assessed Clean Energy \(PACE\) program on the economy of California](#)," Energy Policy 137 (2020).
18. Case Study: Ajami, Naushua K. and Wyss, Noemi, "[Tapping into Alternative Ways to Fund Innovation and Multipurpose Water Projects: A Financing Framework from the Electricity Sector](#)," Stanford Woods Center for the Environment, Stanford University, February 2016.
19. Case Study: [Danish Climate Investment Fund](#), September 2017 (KIF and Convergence).
20. Case Study: [The Great Lakes and St. Lawrence Blue Growth Fund Final Report](#), 2017.

### **Videos to watch:**

1. [Democratizing Capital for Energy and Sustainable Growth Transitions](#), Milken Institute Global Conference, May 2, 2023

*If COP 27 proved anything, it is that pledges to achieve sustainable development, resilience, and technology solutions will not be met by unfunded pledges at international conferences, but by rational financing. In short, what gets measured gets financed. When developing countries must borrow at 11 to 20 percent (wealthy countries pay about few less, the cost of money constitutes an insurmountable barrier to development, especially to middle- and low-income countries in Asia and Africa. Just as hard-hit countries were given access to concessionary borrowing to meet Covid-related costs, so too must developing economies be offered the creative financing needed to create sustainable solutions in the fields of energy, transport, construction, agriculture, and health care. Experts in the fields of international development and finance will discuss how capital structure matters now more than ever in building a regenerative and inclusive global economy for sustainable stability and growth.*

Speakers include, **Irene Arias Hofman, CEO, Inter-American Development Bank Lab; Julie Becker, CEO, Luxembourg Stock Exchange; Yaniv Tepper, Founder, Angeleno Group; Simon Winter, Executive Director, Syngenta Foundation**

2. [The Price on Nature](#) (Richard Sandor)
- 3.
4. [Leveraging Sustainable Finance for the Energy Transition](#), COP 26, Glasgow.

#### **Solid Waste and WASH (Water, Sanitation and Hygiene)**

1. \*Blass, Vered, Heffer, Shiri, Yago, Glenn and Zecher, Steven, "[Financing Solid Waste Disposal in Israel](#)," Financial Innovations Lab Report, Milken Institute, November 2012.
2. Hyun, Christopher, et. al., [Sanitation for Low Income Regions: A Cross-Disciplinary Review](#), Annual Review of Environment and Resources, 2019. 44:287-318, 2019.
3. Kumpel, Emily and Kara L. Nelson, "[Intermittent Water Supply: Prevalence, Practice, and Microbial Water Quality](#)," Environmental Science and Technology 50/2 (December 15, 2016).
4. Tarpeh, William A., et. al., "[Evaluating ion exchange for nitrogen recovery from source-separated urine in Nairobi, Kenya](#)," Development Engineering, Vol 3 (2018): 188-195.
  - a. See video on Tarpeh's work on upcycling urine as fertilizer, see: [here](#).
5. Hobbs, Shakira and Nicole Barclay, "[Sustainability Approach: Food Waste to Energy Solutions for Small Rural Developing Communities](#)," International Journal of Environmental, cultural, Economic and Social Sustainability: Annual Review, 2018.
6. Case Study: Walske, Jennifer M. and Laura D. Tyson, "[Sanergy: Tackling Sanitation in Kenyan Slums](#)," Berkeley Haas Case Studies, July 2016.

#### **River Revitalization and Smart Watershed Management**



1. \*"[Financing Kidron/Wadi El Nar River Revitalization](#)," Financial Innovations Lab Report, Milken Institute, July 2013,
2. "[Revolving Fund for River Restoration](#)". Financial Innovations Lab Report, Milken Institute, December 2009.
3. Maclean, Caitlin and Yago, Glenn, "[Financial Innovations for Freshwater Revitalization: Transboundary Project Finance in Israel, Jordan, and the Palestinian Authority](#)," Financial Innovations Lab Report, Milken Institute, December 2009.

## **Biodiversity**

1. \*\*Key Resource: [IDFC Toolbox on Integrating Biodiversity into Strategies and Operations of Public Development Banks](#), International Development Finance Club, 2022.
2. \*\*[Innovative Finance for Nature and People: Opportunities and Challenges for Biodiversity-Positive Carbon Credits and Nature Certificates](#)," Global Environment Facility, International Institute for Environment and Development, March 2023.
3. \*\*Di Marco, Moreno, et.al., "[Sustainable Development Must Account for Pandemic Risk](#)," Proceedings of the National Academy of Sciences, February 25, 2020, 177 (8) 3888-3892.
4. \*Case Study: Yago, Glenn, "[Biodiversity Conservation in Israel](#)," Financial Innovations Lab Report, Milken Institute, July 2012.
5. \* Case Study: Maclean, Caitlin, [Creating Mechanisms for Conservation Finance in Southeast Asia](#), Financial Innovations Lab Report, Milken Institute, September 2015

### **Videos to watch:**

1. The Future of Biodiversity Finance: Nature Positive Business—Biodiversity as an Asset Class ([here](#)).
2. [Exploring Biodiversity Credits](#): Financing Nature, United Nation

## **VII. Energy Transition (October 21)**

### **Practitioner Guest Lecture:**

#### **Jake Cusack, CrossBoundary Group.**

1. \*\*Less, Tessa, Jean-Piere, Kathleen and Carr, Henry, [Constructing Africa's Green Economy Requires New Building Blocks](#), CrossBoundary Energy, March 2024.
2. **Key Resource:** <https://www.climatebonds.net/standard/electrical-grids-and-storage>
3. \***Case Study:** Teal Emery, "[Solar Can't Scale in the Dark](#)," Energy for Growth Hub, May 2023.\*Case Study: "[Climate Investor One](#)", 2022.
4. \***Case Study:** "[Grid Densification: Innovation Insight](#)" Mini-Grid Innovation Lab, Cross boundary, June 20, 2023.
5. \***Case Study:** Pavlak, Leticia P., et.al., [Ignite Power in Rwanda: Electric Power on a Different Scale for All?](#) IESE Business School, University of Navarra, OOP-625-E, April 2021

## Case Studies for Catastrophic Risk and Climate Change

1. \*Etzion, Dror, Emmanuel Kyraios, and B Forgues, [Employing Finance in Pursuit of the Sustainable Development Goals: The Promise and Perils of Catastrophe Bonds](#),<sup>2</sup> Academy of Management Discoveries 2019, 5/4 (530-554).
2. \*Ando, S., et.al., [Sovereign Climate Debt Instruments: An Overview of the Green and Catastrophe Bond Markets](#), IMF Climate Note, 2022/004.
3. \*[How Agricultural Index Insurance Can Promote Risk management and Resilience in Developing Economies](#), Feed the Future Innovation Lab for Markets, Risk and Resilience, University of California Davis, September 2019,
4. \***Case Study:** [Long duration energy storage for a renewable grid](#), McKinsey & Co., 2021.
5. \*\*Yago, Glenn (ed.), “Development Finance Case Studies: Innovative Finance for Sustainable Development Goals,” Milken Innovation Center-Jerusalem Institute, 2018:
  - a. Case Study 3: Ignite Power, Rwanda.
  - b. Case Study 5: Gigawatt Global, Rwanda.
  - c. Case Study 6: Sustainable Water Finance in California and Israel: Financing Tech Transfer.

## VIII. Food Water Nexus (October 28)

### Practitioner Guest Lecture:

#### Simon Winter and Baskar Reddy, Syngenta Foundation for Sustainable Agriculture

1. \*\*[Systems Financing for Climate Smart Agriculture](#), Milken Innovation Center, Financial Innovations Lab, In collaboration with Syngenta Foundation for Sustainable Agriculture, May 2024.
  - a. See also summary of Milken Institute Global Conference Session: J. Cusack, “[Exploring systems finance for sustainable development](#),” May 20, 2024 and watch video of session from May, 2024, [here](#).
2. \*\* Burwood-Taylor, S. Devermann and D. Zook, [Climate Capital: Financing Adaptation Pathways for Smallholder Farmers](#), ISF/AgFunders, April 2024.
3. \*\***Case Study:** Caren Holzman and Ken Boyce, [Mainstreaming Scaling Initiative Case Studies: SFSA](#), Enabling Outcomes, November 2023.
4. \*\*[Financing for Regenerative Agriculture](#), Rockefeller Foundation, Transformational Investing in Food Systems, Pollination, June 2024.
5. \*\*[Priority Innovations and Investment Recommendations for COP28](#),” Innovation commission: Climate change, Food Security and Agriculture, University of Chicago Development Economics. Individual Innovation Cases: Improved Weather and Seasonal Forecasts, Rainwater Harvesting, Microbial Fertilizer, Innovations to Reduce Livestock Methane emissions, Digital Agriculture, Climate-Resilient Social Protection, Alternative proteins. October 2023.
6. \*\*Wiggins, Steven and Neema Patel, “[Climate Smart Agriculture: A recent Review of the Literature](#),” Syngenta Foundation for Sustainable Agriculture, May 2024.
7. \*\*[Accelerating Agritech Solutions in Israel, California, and Developing Economies](#).

- Financial Innovations Lab Report, Milken Innovation Center/Blum Lab, Jerusalem Institute, June 2020.
8. \*\* Schmidt, Amy. “[The Time is Now for Climate Smart Supply Chains](#).” April 2023. (explores multiple producer, aggregator, and guaranteed offtake agreements).
  9. \*\*Rosa, Lorenzo, et.al., “[Closing the yield gap while ensuring water sustainability](#),” Environmental Research Letters, 13, 104001, 2018
  10. \*\*“[Financial Models for Water Sustainability](#),” Financial Innovations Lab Report, Milken Innovation Center- Jerusalem Institute, April 2016
  11. \*\*“[Paying for Outcomes—Protecting Human and Animal Health in Sub-Saharan Africa](#),” Financial Innovations Lab Report, Milken Institute, February 2011.
    - a. \***Case Study**: The Case of Aflatoxin and Maize Production Pay-for-Outcomes; See also: Ag Results Summary of Project, [here](#).
  12. \*\***Key Resource**: Climate Bonds Initiative Agricultural Criteria: <https://www.climatebonds.net/standard/agriculture>
  13. \***Case Study**: [Climate Smart Agriculture in Bangladesh](#), Working Paper, Institute of Development Studies, May 24, 2024.
  14. \***Case Study**: Outcomes-Based Finance Framework: Farm and Landscape Trials—Building Regenerative Landscape Initiatives, December 2023.
  15. **Green Returns: Unleashing the Power of finance for Sustainable Food Systems**”, White Paper, World Economic Forum in Collaboration with Deloitte, July 2023.
  16. \***Case Study**: Levi, Retsef, Manoj Rajan, Somya Singhvi, Yanchong Zheng, [The impact of unifying agricultural wholesale markets on prices and farmers’ profitability](#) , Proceedings of the National Academy of Sciences Feb 2020, 117 (5) 2366-2371; DOI: 10.1073/pnas.1906854117
  17. \***Case Study** Du, X., Lu, L., Reardon, T. and Zilberman, D., “[The Economics of Agricultural Supply Chain Design: A Portfolio Selection Approach](#),” American Journal of Agricultural Economics, 98/5 (10 October 2016):1377-1388.
  18. \* **Case Study** “[Conducting A Feasibility Study for a Financing Facility for Cocoa Smallholders in Ghana](#),” Convergence, Rabo Bank, Rainforest Alliance, May 2018
  19. \***Case Study**, “[Catalytic Climate Finance Facility \(CCFacility\)](#),” Convergence and Climate Policy Initiative, 2023.
  20. \* **Case Study** “[Financing Fisheries Reform: Blended capital approaches in support of sustainable wild- capture fisheries](#),” Environmental Defense Fund and Duke Nicholas Institute for Environmental Policy Solutions, January 18, 2018
  21. \* **Case Study** “[Financing Sustainable Land Use: Unlocking business opportunities in sustainable land use with blended finance](#),” KOIS Invest and Blended Finance Taskforce, January 2018
  22. Herrero, Mario, et.al., “[Articulating the effect of food systems innovation on the Sustainable Development Goals](#),” Lancet Planet Health, December 8, 2020.
  23. \*\*[Pathways to Prosperity: Rural and Agricultural Finance: State of the Sector Report](#), Feed the Future-USAID, ISF, Rural and Agricultural Finance Learning Lab. 2020.
  24. \*[Examining the Climate Finance Gap for Small-Scale Agriculture](#), Climate Policy Initiative, 2020.
  25. Tam, Vikki and Chris Mitchell, “[How Farmer-Allied Intermediaries can Transform Africa’s Food Systems](#),” Bain and Company, 2020.

26. Havemann, T., Negra, C. & Werneck, F. [Blended finance for agriculture: exploring the constraints and possibilities of combining financial instruments for sustainable transitions](#). *Agric Hum Values* 37, 1281– 1292 (2020). <https://doi.org/10.1007/s10460-020-10131-8>
27. Dominik Kaluser and Christine Negra, [Getting Down to Earth \(and Business\): Focus on African Smallholders’ incentives for Improved Soil Management](#), Sustainable Food Systems, 6 October 2020.

### **Videos to Watch:**

1. Somya Singvi, MIT, [Unifying Ag Markets for Price Discovery](#) (Levi, et.al. Case study above), 2020.
  - a. Please read overview by Manoj Rawat, “Need for Unified Agricultural Market integrated with Agri Value Chains in India,”: [here](#). See also video, “Linking Farmers with Markets, 2021: [here](#).”
2. [Resilience Credits: Innovation in Shaping New Markets for Food Security](#), Dr. Jo Puri, IFAD, February 2024.
3. Robot Assisted Precision Irrigation Delivery (RAPID): [here](#).

## **IX. Framing Finance: Lessons Learned from [New \(Endogenous\) Growth Theory](#) and Economics of Climate Change (November 4)**

1. \*\*Baccaro, L., Hadziabdic, S. [Operationalizing growth models](#). *Qual Quant* **58**, 1325–1360 (2024). <https://doi.org/10.1007/s11135-023-01685-w>
2. \*\*“Integrating nature and knowledge into economics,” [Popular Science Background](#), Nobel Prize in Economic Sciences, 2018. (Key Reading Background on Endogenous Growth Theory-Romer, et.al.)
3. \*\*[New Growth Models: Challenges and Steps to achieving patterns of more equitable, inclusive and sustainable Growth](#), Global Agenda Council of New Growth Models, World Economic Forum, January 2014.
4. \*\*Ross Levine, “[Finance, Growth and Inequality](#)”, IMF Working Paper, WP/21/164 (June 2021).
5. \*\*[Economic Growth, Technological Change, and Climate Change](#), Scientific Background Paper, Economic Sciences. Nobel Prize, 2018. (Key background reading on Nordhaus, Eccles, etc. impact of climate finance and environment, green accounting, etc.).
6. Diwan I., Guzman M., Kessler M., Songwe V., Stiglitz J.: “[An Updated Bridge Proposal: Towards A Solution to the Current Sovereign Debt Crises and to Restore Growth](#)”, Finance for Development Lab and Initiative for Policy Dialogue. Policy Note. July 2024.
7. Levine Aghion, Peter Howitt, and Ross Levine, “[Financial Development and Innovation-Led Growth](#),” in T. Beck and R. Levine, *Handbook of Finance and Development*, London: Elgar, 2018
8. Mollaahmetoglu, E. and G. Y. Akcali, “[The Missing-Link between Financial Development and Economic Growth](#): Financial Innovation, *Procedia Computer Science* 158 (2019) 696–704 This important reading contextualizes financial innovation as part of this project development.

### **Videos to Watch:**

1. Tyler Cowan, Marginal Revolution, On Romer’s contribution to development economics

## [Endogenous Technological Change](#)

2. [EconJohn, Endogenous \(New\) Growth Model](#)

3. EconJohn, [Endogenous Growth Models-Learning by Doing](#)

### **X. Structural Evolution of Capital Markets and Development Finance (November 11)**

1. \*\*Cusack, Jake. [Every Deal is a Blended Finance Deal](#), CrossBoundary Group, June 2024.
2. \*\*Leas, Brett and Akila Grewal, [Asset Backed Finance: The Next Evolution of Private Credit](#), Apollo Academy, October 2023.
3. \*\*Ben Yahmed, Z., N. Pinko, C. Grant, and J. First, [Landscape of Guarantees for Climate Finance in EMDEs](#), Climate Policy Initiative, February, 2024.
4. \*\*[Corporate Finance: A Roadmap to Mainstream SDG Investments](#), UN Global Compact Action Platform on Financial Innovation for the SDGs, 2019.
5. \*\*[Capital Markets and Sustainable Finance, Chapter 5](#), World Investment Report, 2021, UNCTAD.
6. \*\***Key Resource:** [“High Level Mapping to SDGS: Green, Social and Sustainable Bonds,”](#) International Capital Markets Association, June 2023. N. B.—you can download this in Excel format from the website above.
7. [Handbook: Harmonic Framework for Impact Reporting](#), Green and Social Bond Principles, June 2022.
8. \*\*Niemann, Doug, [“Understanding Structured Credit: Perspectives for Insurance Capital Requirements,”](#) Athene, 2022.
9. \*\*Carney, Kevin, et.al., [“The Endowment Effect of Collateralized Loans,”](#) Development Innovation Lab, University of Chicago, Working Paper, No. 2022-70, May 2022.
10. Allison Harwood, [“Accelerating Securitization in Africa to Finance the SDGs: Future Flow Securitizations,”](#) Milken Institute, February 8, 2021.“
11. Allison Harwood, [“Securitization: Positive Instrument to Help fund the Sustainable Development Goals,”](#) Milken Institute, 2022.
12. \*\*Bernardo Bortolotti, Giacomo Loss and Robert W. Zwieter, 2023. [“The times are they a-changin’? Tracking sovereign wealth funds’ sustainable investing,”](#) Journal of International Business Policy, Palgrave Macmillan, vol. 6(3), pages 276-305, September. See also: [“The Sustainability Footprint of Sovereign Wealth Funds: Recent Developments, NYU Abu Dhabi, Transition Investment Lab, here.](#)
13. Bernstein, Shai, Abhishek Dev and Josh Lerner, [“The Creation and Evolution of Entrepreneurial Public Markets,”](#) Journal of Financial Economics, 136/2 (May 2020): 307-329.
14. **Key Resource:** 2023. Data Base of Impact Asset Managers.
15. **Key Resource:** Serafeim, George, T. R. Zochowski and Jen Downing, [Impact-Weighted Financial Accounts: The Missing Piece for an Impact Economy](#), Harvard Business School, 2019.
  - a. Follow further development through Impact -Weighted Accounts Framework: Measuring Value Creation Beyond Profit Website: [here.](#)
16. \***Case Study:** Patrick Bolton and Frederic Samama, [Capital Access Bonds: Contingent Capital with an option to Convert,](#) Economic Policy, April, 2012.
17. \***Case Study:** [Viability of Gender Bonds in SSA: A Landscape Analysis and Feasibility Assessment](#), FSDAfrica/UN Women, September 2020.
18. \***Case Study:** [EUR 7-year Social Bond: African Development Group](#), 2021
19. \***Case Study:** [Masala Green Bond: IFC and YES Bank](#)
20. \***Case Study:** [John Schellhase and Harris Mohsin, Ghana’s Daakye Program: An African Securitization Case Study](#), Milken Institute, 2021.

21. **\*\*Special Section on Sustainability-Linked Bonds:**
  - i. **\*Case Study:** [What are Sustainability-Linked Bonds and how can they support the net-zero transition?](#), November 2022
  - ii. [Sustainability-Linked Bonds: Guidance for sustainability-link bonds as transition finance instruments](#), Climate Bonds, November 2022.
  - iii. Raquel de la Orden and Ignacio de Calonje, [Sustainability-Linked Finance: Mobilizing Capital for Sustainability in Emerging Markets](#), International Finance Corporation, January 2022.
  - iv. Vulturius, Gregor, et.al., [“Sustainability-linked bonds—their potential to promote issuers’ transition to net-zero emissions and future research directions,”](#) *Journal of Sustainable Finance and Investment*, February 2022.

### **Key Videos to watch:**

1. [Investing with Impact through Public Securities Markets to Finance the SDGs](#), Virtual Forum, Milken Institute, July 8, 2021 (Evan Harvey, Head of Sustainability, Nasdaq, Shameela Soobramoney, Chief Sustainability Officer, Johannesburg Stock Exchange, Quyen Tran, Impact Investing, BlackRock)
2. [Asset Backed-Finance: The Next Evolution of Private Credit](#), Apollo Academy, October 6, 2023
3. Paddy Hirsh, [Capital Structure Explained](#)
4. Managerial Finance, [Capital Structure](#)
5. [“Bridge and Blend: The Role of DFIs in Scaling Sustainable Financing,”](#) Milken Institute, Virtual Forum, February 21, 2021: Amit Bouri, Global Impact Investing Network; Joan Larrea, CEO, Convergence; Nancy Lee, Center for Global Development; Monish Mahurkar, IFC

## **XI. Financing Ideas: Disruptive Science and Tech Finance for SDGs (November 18)**

### **Guest Lecture:**

#### **Andrew Lo, MIT Financial Engineering Lab, New Funding Models for Biomedical Innovation**

1. **\*\*Allen, Franklin and Yago, Glenn.** "Financing the Future: Market-Based Innovations for Growth". Upper Saddle River, New Jersey: Pearson/Wharton School Publishing, 2010:Chapter 7: Financing Cures
2. **\*\*Lo, Andrew W. and Richard T. Thankor,** [“Financing Biomedical Innovation,”](#) Annual Review of Financial Economics, Vol. 14 (2022):231-270.
3. **\*\*Reinventing Business through Disruptive Technologies: Sector Trends and Investment Opportunities in Emerging Markets,** IFC 2019.
4. **\*\*Ranil Dissanayake and Bernat Camps Adroque,** [The Case for More Pull Financing,](#) Center for Global Development, June 8, 2023.
5. **\*\*Winter, Simon and Robert Berlin,** [Progressing innovations towards scale-up: From learning to action,](#) August 2021, Syngenta Foundation strategy paper, co-author with Robert Berlin
6. **\*\* Kremer, Michael, Jonathan Levin, and Christopher M. Snyder.** 2020. ["Advance Market Commitments: Insights from Theory and Experience."](#) AEA Papers and Proceedings, 110: 269-73.DOI: 10.1257/pandp.20201017
7. **\*\*Alan Ho and Jake Taylor,** [“Using Advance Market Commitments for Public Purpose Technology Development,”](#) Belfer Center for Science and International Affairs, May 2021.

8. \*\* Center for Global Development, “[Making Markets for Development Innovations](#), December 2022.
9. \***Case Study**: Church, Emily, et.al., [Agritech in Africa: Why an AgriTech Innovation Competition?](#), Milken Institute/ World Food Programme, April 2023.
10. \***Case Study**: Aragon, G., et.al., [Electricity Access in Africa: Why a Green Energy Innovation Competition?](#) Milken Institute, Marcj 2024.
11. \***Case Study**: Abdullah Alhamdan, Z.M. Halem, et.al., [Financing Fusion Energy](#), Journal of Investment Management, 21/1 (2023).
12. \***Case Study**: Lo, Andrew W., and Kien Wei Siah (2021), Financing Correlated Drug Development Projects, Journal of Structured Finance, <https://doi.org/10.3905/jsf.2020.1.114> .
13. \***Case Study**: Forman, S. M., et.al., [Medicine via Public Markets: The Business Development Company,](#)” Journal of Investment Management, 13/4 (2015): 9-
14. \***Case Study** \* Lo, Andrew W. and Narahariseti, Sourya, 2014, “[New Financing Methods in the Biopharma Industry: A Case Study of Royalty Pharma, Inc.,](#)” Journal of Investment Management 1.

#### **Videos to Watch:**

1. Andrew Lo, MIT Financial Engineering Lab, [New Funding Models for Biomedical Innovation](#)
2. Michael Kremer, University of Chicago, Development Innovation Lab, [Designing Incentives for vaccine Innovation, Production and Distribution: Lessons from the pandemic](#)
3. Israel Innovation Authority, [Making an Impact on Food Security Worldwide](#)
4. UBQ, [New Material from Food Waste—Circular Economy at its Best](#)

## **XII. Global Development Finance—Global Health (November 25)**

1. Shekar, Meera, et.al., “[Innovative Financing for Nutrition](#),” Nature Food, VOL. 4 (23 June 2023):464- 471.
2. Kremer, Michael, et.al., “[Water Treatment and Child Mortality: A Meta-analysis and Cost-effectiveness Analysis](#),” BFI Working Paper No. 2022-26, Development Innovation Lab, University of Chicago, January 2023.
3. Damani, Shazneed, et.al.,”[Using Wastewater Data About Infectious Disease Dynamics in Communities: Issue Brief](#),” Mathematica, Rockefeller Foundation, 2023.
4. Speich, Cornelia & Barth-Jaeggi, Tanja & Musard, Capucine & Havugimana, Cassien & Nwokoro, Charles & Gakuba, Elvis & Zamil, Farhad & Secula, Florence & Thönnissen, Carmen & Six, J. & Kraemer, Klaus & van Zutphen, Kesso & Sonneveld, Martijn & Tshering, Puja & Erismann, Séverine & Berg, Sophie & Winter, Simon & Johnson-Chadwick, Victoria & Pannatier, Marnie & Prytherch, Helen. (2023). Nutrition in City Ecosystems (NICE): Protocol of a multi-sectoral development project to improve food and nutrition security of secondary city populations in Bangladesh, Kenya and Rwanda. *Frontiers in Public Health*. 11. 10.3389/fpubh.2023.1081535.
5. Vu, Jonathan Tlm, et.al. “[Financing Vaccines for Global Health Security](#),” Journal of Investment Management, 20/2 (April 2022)
6. Miles, Samuel B., Jessica Kersey, Emiliano Cecchini, Daniel M. Kammen,

- [Productive uses of electricity at the energy-health nexus: Financial, technical and social insights from a containerized power system in Rwanda](https://doi.org/10.1016/j.deveng.2022.100101), Development Engineering, Volume 7,2022, <https://doi.org/10.1016/j.deveng.2022.100101>.
7. Lorcan Clarke, et.al., “[Development Impact Bonds Targeting Health Outcomes](#),” Center for Global Development 133, December 2018
  8. Bharadwaj M, Bengtson M, Golverdingen M, Waling L, Dekker C. [Diagnosing point-of-care diagnostics for neglected tropical diseases](#). PLoS Negl Trop Dis. 2021 Jun 17;15(6): e0009405. doi: 10.1371/journal.pntd.0009405. PMID: 34138846; PMCID: PMC8211285.
  9. \* Paul Yager, Gonzalo J. Domingo, John Gerdes, [Point-of-Care Diagnostics for Global Health](#), [Annual Review of Biomedical Engineering](#) 2008 10:1, 107-144
  10. \*\*Chng, Belinda, MacLean, Caitlin, Singh, Harlin, “[New Models for Financing Vaccination Programs in Southeast Asia](#),” Financial Innovations Lab Report, Milken Institute, 2016.
  11. [The health lab in your pocket](#), Berkeley Engineering, April 26, 2021.

### **Videos to Watch**

1. [Financial Innovation for Global Health](#): Covers GAVI, Gates Foundation, and other initiatives.
2. **Case Study:** [An infectious disease laboratory the size of a smartphone](#), Daniel Fletcher, Blum Center for Developing Economies—World Economic Forum 2021.
3. **Case Study:** [Lessons from the world’s first development impact bond for maternal health](#),” Government Outcomes Lab, Mathematica, 2021.
  - a. See midline Report and Case Study (Utkrisht Impact Bond) and watch video session recording of this important first innovation in maternal health.

### **XIII. Infrastructure and Urban Revitalization Finance (December 2)**

#### **Practitioner Guest Lecture:**

**Dan Carol, “[The Case for an Infrastructure Pre-Development Fund](#),” Milken Institute Review (April 2020), Center for Financial Markets, Milken Institute**

1. \*\*Jayles, Bertrand, et.al., “[Including climate risks in infrastructure asset valuation: a data-driven modelling approach](#),” EDHECintra & Private Assets Research Insights, Summer 2023:4-6.
2. \*\*[Blended finance in infrastructure](#), World Bank-Global Infrastructure Hub, February 2024.
3. [“Unlocking Infrastructure Investment: Innovative Funding and Financing in Regions and Cities”](#), OECD, 2021. or G20 Infrastructure Working Group, 2021.
4. \*\*[New Perspectives on Results-Based Blended Finance for Cities: Innovative Finance Solutions for Climate-Smart Infrastructure](#), International Bank for Reconstruction and Development/World Bank 2019.
5. \*\*C40 Finance Facility, [How to Finance Urban Infrastructure: Explainer](#), 20



6. Satterhwaite, David "[The Impact of Urban Development on Risk in Sub-Saharan Africa's cities with a focus on small and intermediate Urban Centers](#)," International Journal of Disaster Risk Reduction, 26 (2017) 16-23.
7. Case Study: \*"[New Perspectives on Climate Finance for Cities: Finance Solutions for New and Emerging Infrastructure Approaches to Urban Climate Mitigation and Adaptation](#)," Siemens-Citi-C40 Cities. 2021
8. Case Study: "[Hartford County Metropolitan District](#)," Moody's Credit Opinion, August 2022.
9. Case Study: "[Financing Urban Resiliency: Coastal Resiliency in Lower Manhattan](#)," Milken Institute Financing, Financial Innovation Lab, September 2019

### **Videos to Watch:**

["Infrastructure, Resilience and Recovery: A Webinar on Innovative Policy, Funding and Financing Mechanisms for a New Era,"](#) Milken Institute/ United for Infrastructure, June 2020.

(Note specifically, Laura Drescher, Quantified Ventures; also their website on outcomes- based finance for infrastructure and case studies of DC Environmental Impact Bond and first publicly offered environmental impact bond as key financial innovations [here](#)).

["What if we could pave Africa's roads?,"](#) Gyude Moore, Center for Global Development, 2022.

### **Housing**

2. \*\*Allen, Franklin and Yago, Glenn. "Financing the Future: Market-Based Innovations for Growth". New Jersey: Wharton School Publishing, 2010:
3. Chapter 4: Innovations in Housing Finance.
4. \*\*Allen, Franklin, James R. Barth, and Glenn Yago, "[Fixing the Housing Market: Financial Innovations for the Future](#)), Wharton School Publishing 2012: Chapter 1, "Housing Crises Go Global: The Boom, The Bust and Beyond," 1-68; Chapter 4: "Housing in Emerging Markets," 103-138; Chapter 5: "Future Innovations in Housing Finance," 139-170, New Jersey: Wharton School Publishing/Pearson, 2012.
5. "[Toward Affordable Housing in Israel](#)," Financial Innovations Lab Report, Milken Innovation Center- Jerusalem Institute, October 2013.
6. "[Financing Green Building in Residential Development](#)," Financial Innovations Lab Report, Milken Innovation Center-Jerusalem Institute, March 2017.

### **XIV. Program Implementation Presentations (December 9)—UC-Berkeley Students Only-End of their Fall Semester.**

**N. B.(Hebrew University Track continues with participating MDP Global Studens with [In-Class Review of Sections II-XII will continue in weekly sessions through February 3, 2024](#)).**  
**Hebrew University/MDP Track Students have Project Concept Presentations on [January 27 and February 3, 2](#)**

