

# **Managing Climate, Cyber, Geopolitical, Pandemic and Financial Risks: An Integrated Approach**

## **FINC-GB.2375/UB.75 Fall 2022 Professor Richard Berner**

### **Course overview**

Businesses and governments now face a growing and immediate array of non-financial risks, including climate-related, cyber and operational, geopolitical, and pandemic risks. Precisely because these critical risks are hard to measure and analyze, firms are putting both new and old resources – AI, data, people and money – to work to anticipate, manage and mitigate them. To address cybersecurity risks, for example, JP Morgan alone has 4000 employees and spends \$600 million annually. The pandemic and other health-related issues are here to stay. Firms are only starting to grapple with existential climate-related and other risks. And regulators and Congress are beginning to contemplate how to identify, measure, and formulate policies to mitigate them.

This course will study these risks alongside financial risks. It will outline frameworks for measuring, assessing and analyzing them, and for actions needed to meet them. We will examine case studies of climate, cyber, geopolitical, pandemic and financial risks, including from current events. We will assess the spillovers among these risks, and why an integrated (e.g. enterprise-wide or system-wide) approach helps to manage them. Finally, we will study whether and how the information in financial markets can both inform the assessment of these risks and potentially provide tools to transfer, insure against or hedge them. The course content mirrors the work we are doing the [NYU Stern Volatility and Risk Institute](#), and students are encouraged to explore our website to learn more.

Starting with an overview of enterprise risk management, the course will present an assessment framework. We will then examine each of the five pillars of risk discussed above -- cyber, climate-related, geopolitical, pandemic and financial – in five modules. One or more classes in each of those modules will include expert practitioners such as risk managers or policymakers. Finally, we will study the interplay among these risks, the data and new tools needed to assess them, and policy implications.

### **Learning outcomes**

The goal of this course is to equip students with an understanding of the 21<sup>st</sup> century risk management practices firms now demand. Students will learn the strengths and weaknesses of risk management tools and operational and financial resilience planning. Students will also learn the interdisciplinary nature of these activities, as teamwork across firms is important in business. Student class participation will be stressed. Reflecting that approach, the course is designed to be accessible for undergraduates, full-time and part-time MBAs, and to students in law, public policy and other schools at NYU.

## Schedule.

FINC-GB.2375/UB.75 meets on Mondays and Wednesdays beginning September 7, 2022 and ending on December 12. The class is divided into two sections: Section 1 meets from 9:30 AM - 10:45 AM, and Section 2 meets from 11:00 AM - 12:15 PM, both in Tisch LC25. University policy is that classes are held in person. Students who are not able to come to a particular class should notify me and our Teaching Fellows, Aigerim Sansyrbay and Victor Diaz Ferreiras; see below. Classes will not meet on designated holidays (October 10 and November 23).

## Materials.

**NB:** *The understanding of, management of, literature about, and policy actions being taken to address these risks are all evolving quickly. Consequently the materials and approaches in what follows will change, and class visitors are TBD. This is exciting -- Stay tuned!*

There is no textbook required for the course, but a few are recommended, and some readings will be found in the following texts:

James Lam, [Enterprise Risk Management: From Incentives to Controls](#) (Wiley Finance) 2nd Edition, 2014. (The Third edition is coming; we will use it if available). Amazon [rents](#) the book for around \$43; an e-book is available.

You should obtain Joseph Romm, [Climate Change: What Everyone Needs to Know](#), Oxford, 3<sup>rd</sup> Ed., 2022 in paperback. The bookstore lists it as required.

John Hull, [Risk Management and Financial Institutions \(5<sup>th</sup> Edition\)](#). Amazon rents the book [here](#) for \$42; an e-book is available.

Stephen G. Cecchetti and Kermit L. Schoenholtz, [Money, Banking and Financial Markets \(5<sup>th</sup> Edition](#); ISBN 978-1259746741), McGraw-Hill Irwin, 2017. Amazon currently rents the book ([here](#)) for about \$30 per semester or in electronic format on Amazon.

John Armour, Dan Awrey, Paul Davies, Luca Enriques, Jeffrey N. Gordon, Colin Mayer, and Jennifer Payne, [Principles of Financial Regulation](#), Oxford Scholarship Online, 2016  
Geoffrey Miller, [The Law of Governance, Risk Management and Compliance](#), for [rent](#) on Amazon for \$45. There is an eBook; we will investigate other cheaper sources.

This book may also prove useful:

Richard Apostolik and Christopher Donohue, [Foundations of Financial Risk: An Overview of Financial Risk and Risk-based Financial Regulation](#), 2nd Edition, (Wiley Finance). Amazon [rents](#) the book here for \$36. It's on Kindle and we will investigate other cheaper sources.

Other readings will be found in other books, as noted below.

***All texts and other books are on reserve at Bobst Library, digitally, and the NYU bookstore should have availability as well.***

You should have completed a basic course (or demonstrate some proficiency) in each of macroeconomics, finance and statistics. *In addition, prior to the course, if you are unfamiliar*

with or want a review of financial Instruments, financial Markets, and financial Institutions, you should read or at least browse chapters 1-3 of Cecchetti and Schoenholtz.

Required readings appear below (aside from the readings noted above and those found on [GARP](#) and [Risk.Net](#); the latter is available through NYU library (bobcat) access). Required readings should be completed before class. Recommended/optional readings are found below those required. These provide additional background for interested students.

Students are expected to keep abreast of major risk management, financial and policy developments, using resources like various websites from regulators and GARP, *The Economist*, the *FT*, and the *WSJ*. Access to these publications is available to students at heavily discounted rates.

### **Course Requirements: Exams, Assignments and Grades.**

There will be a multiple-choice quiz, an in-class midterm, and a final exam during the exam period. The quiz will be graded *redemptively*: if your midterm exam grade is higher, the quiz weight will be lowered (as specified below). There will also be a take-home, ungraded practice exam for your benefit.

In addition, each week, choose one of the non-textbook readings listed in the Lessons tab on NYU Brightspace (preferably no more than one reading for each Lesson), and be prepared to discuss it in class. We will use these as material for discussion in breakout rooms during class.

Attendance in class or online is required. Both attendance and class participation will influence the course grade; participation will count for 10%, modify grades in the case of (good or bad) outliers, and will serve as tiebreakers.

There will be no make-ups for the quiz or the midterm exam, which are required of all students. Any absence from a test without prior written approval from the professor constitutes a failure (a grade of zero) of the quiz or exam. If the professor excuses a student from the quiz, the weight on the midterm exam will be increased accordingly. If the professor excuses a student from the midterm exam, the weight on the final exam will be increased accordingly. The only valid reason for seeking to be excused is a serious (documented) illness or the equivalent.

Course grade weights for each component are:

Practice Exam	Take home; Ungraded, for your benefit
Short Quiz (in-class)	10% (5% if quiz grade is less than first exam grade)
Exam 1 (in class)	35% (40% if first exam grade exceeds quiz grade)
Exam 2 (in class)*	45%
Attendance & class participation:	10% and influences tie-breaks and outliers (good and bad)

\*Exam will be held during the exam period in December as determined by the registrar. Material covered won't be cumulative; the second exam will draw on tools learned in first half but will not test details of that material.

**Please note the following key (but still tentative) dates in your calendars:**

<b>Practice Exam</b>	<b>September 21</b>
<b>Quiz</b>	<b>September 28</b>
<b>Exam 1</b>	<b>October 31</b>
<b>Exam 2</b>	<b>December 16-22</b>

### **NYU Brightspace**

Aside from the selections from the textbooks, and the links below, everything you need for this course will be posted to NYU Brightspace: readings, assignments, slides, and links to information sources.

### **Teaching Fellows**

Aigerim Sansyrbay and Victor Diaz Ferreiras are our TFs. *Aigerim will be responsible for Section 2 and Victor will be responsible for Section 1.* They will help grade and help you with any questions. Aigerim is a candidate for her Masters in Financial Engineering in the Tandon School of Engineering this May. She can be reached by email at [as15187@nyu.edu](mailto:as15187@nyu.edu). Victor is a candidate for his Masters in Economics in the Faculty of Arts and Sciences this May. He can be reached at [vdd2007@nyu.edu](mailto:vdd2007@nyu.edu).

### **Communication**

The key to any successful relationship is good communication. I plan to use the announcements section of NYU Classes extensively. In return, I expect you to share your comments and observations with me and/or Aigerim and Victor. You may email me ([rberner@stern.nyu.edu](mailto:rberner@stern.nyu.edu)), or catch me before or after class. Your ideas and feedback can make a big contribution to the course.

Online office hours are on Mondays and Wednesdays between 12:15PM and 1:15 PM, but appointments are preferred (and can be arranged by email).

### **Help**

If you need help, please contact me or Aigerim and Victor. We will try to reply to email quickly (if you don't hear from us within 24 hours, please try again).

## Visitors

We'll have several visitors – practitioners and thought leaders – come to our classes. Their names are on the weekly schedule and on the summary schedule at the end. We have tried to align their visits precisely with the material in class, but in a couple of cases scheduling created slight disconnects. Schedules can be fluid, so we'll keep you informed about any changes.

Because we have two sections of the course, some visitors will come only to one section, and we will record their comments and the Q&A for the other section. Some may come to both sections. We have divided up the visitors and sections equally and may adjust the live/recoded schedules if necessary.

## Professional behavior

In the interest of providing everyone with the best classroom – virtual or actual -- experience, I ask that you:

- Join at least five minutes before class
- Display your name in every class/Please use video in Zoom
- Put smartphones away before class (their use in class is not permitted)
- Be prepared and engaged

## ACADEMIC INTEGRITY

Our undergraduate [Academics Pillar](#) states that ***we take pride in our well-rounded education and approach our academics with honesty and integrity.*** Indeed, integrity is critical to all that we do here at NYU Stern. As members of our community, all students agree to abide by the NYU Stern Student Code of Conduct, which includes a commitment to:

- Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of exams, papers and all other course requirements by not engaging in any method or means that provides an unfair advantage.
- Clearly acknowledge the work and efforts of others when submitting written work as one's own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should be fully referenced.
- Refrain from behaving in ways that knowingly support, assist, or in any way attempt to enable another person to engage in any violation of the Code of Conduct. Our support also includes reporting any observed violations of this Code of Conduct or other School and University policies that are deemed to adversely affect the NYU Stern community.

The entire Stern Student Code of Conduct applies to all students enrolled in Stern courses and can be found here: [www.stern.nyu.edu/uc/codeofconduct](http://www.stern.nyu.edu/uc/codeofconduct)

To help ensure the integrity of our learning community, prose assignments you submit to NYU Classes will be submitted to Turnitin. Turnitin will compare your submission to a database of

prior submissions to Turnitin, current and archived Web pages, periodicals, journals, and publications. Additionally, your document will become part of the Turnitin database.

## GENERAL CONDUCT & BEHAVIOR

Students are also expected to maintain and abide by the highest standards of professional conduct and behavior. Please familiarize yourself with Stern's Policy in Regard to In-Class Behavior & Expectations (<http://www.stern.nyu.edu/portal-partners/current-students/undergraduate/resources-policies/academic-policies/index.htm>) and the NYU Student Conduct Policy (<https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-student-conduct-policy.html>).

**Note: Evidence of cheating on quizzes, exams or graded assignments will result in a course grade of F without appeal.**

## GRADING GUIDELINES

### Grading Information for Stern Core Courses

At NYU Stern, we strive to create courses that challenge students intellectually and that meet the Stern standards of academic excellence. To ensure fairness and clarity of grading, the Stern faculty have adopted a grading guideline for core courses with enrollments of more than 25 students in which approximately 35% of students will receive an “A” or “A-” grade. In core classes of less than 25 students, the instructor is at liberty to give whatever grades they think the students deserve, while maintaining rigorous academic standards.

### Grading Information for Stern Elective Courses

At NYU Stern, we strive to create courses that challenge students intellectually and that meet the Stern standards of academic excellence. To ensure fairness and clarity of grading, the Stern faculty have agreed that for elective courses the individual instructor or department is responsible for determining reasonable grading guidelines.

## STUDENT ACCESSIBILITY

If you will require academic accommodation of any kind during this course, you must notify me at the beginning of the course (or as soon as your need arises) and provide a letter from the Moses Center for Student Accessibility (212-998-4980, [mosescsa@nyu.edu](mailto:mosescsa@nyu.edu)) verifying your registration and outlining the accommodations they recommend. For more information, visit the CSA website: <https://www.nyu.edu/students/communities-and-groups/student-accessibility.html>

## STUDENT WELLNESS

Classes can get stressful. I encourage you to reach out if you need help. The NYU Wellness Exchange offers mental health support. You can reach them 24/7 at [212 443 9999](tel:2124439999), or via the “NYU Wellness Exchange” app. There are also drop in hours and appointments. Find out more at: <http://www.nyu.edu/students/health-and-wellness/counseling-services.html>

## NAME PRONUNCIATION AND PRONOUNS

NYU Stern students now have the ability to include their pronouns and name pronunciation in Albert. I encourage you to share your name pronunciation and pronouns this way. Please utilize this link for additional information: [Pronouns & Name Pronunciation](#)

### **RELIGIOUS OBSERVANCES AND OTHER UNIQUE SITUATIONS**

NYU's [Calendar Policy on Religious Holidays](#) states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. You must notify me in advance of religious holidays or observances that might coincide with exams, assignments, or class times to schedule mutually acceptable alternatives. Students may also contact [religiousaccommodations@nyu.edu](mailto:religiousaccommodations@nyu.edu) for assistance.

NYU Stern is committed to ensuring an equitable educational experience for all students regardless of identity or circumstances and strives to recognize the obligations its students have outside of Stern. Please review all class dates at the start of the semester and review all course requirements to identify any foreseeable conflicts with exams, course assignments, projects, or other items required for participation and attendance. If you are aware of a potential conflict, please contact me as soon as possible to discuss any potential conflicts to determine whether/how they can be accommodated.

*This course strives to support and cultivate diversity of thought, perspectives, and experiences. The intent is to present materials and activities that will challenge your current perspectives with a goal of understanding how others might see situations differently. By participating in this course, it is the expectation that everyone commits to making this an inclusive learning environment for all.*

## Tentative Class Schedule

### Topics, Readings and Assignments

#### **Week 1 Introduction to Risk Management (September 7 and 12)**

- Risk Topics
- Risk assessment framework
- Enterprise Risk management and regulation
- System-wide risk assessment
- Why regulation?

**Class visitor:** Keishi Hotsuki, CRO Morgan Stanley, September 12

#### **Required Reading**

Park K.F., Shapira Z. [Risk and Uncertainty](#). In: Augier M., Teece D. (eds) [The Palgrave Encyclopedia of Strategic Management](#), Palgrave Macmillan, London.

AXA & Eurasia Group [Future Risks Report](#), September 2021, Forewords and Executive Summary, pp 5-17

James Lam, [Enterprise Risk Management: From Incentives to Controls](#) (Wiley Finance) 2nd Edition, 2014, Ch's 1, 4

Hull, [Risk Management and Financial Institutions](#), Fifth Edition, Ch 1

JP Morgan [2021 Annual Report](#), pp 81-84

Video: [The Big Short trailer \(and following\)](#)

#### **Optional reading :**

World Economic Forum, [The Global Risks Report 2022 17th Edition](#), January 2022, Executive Summary, 7-10

[Stulz, Risk Management, Governance, Culture, and Risk Taking in Banks, FRBNY Economic Policy Review / August 2016](#)

James Lam, [Enterprise Risk Management: From Incentives to Controls](#) (Wiley Finance) 2nd Edition, 2014, Ch's 2,3; Section Two: The Enterprise Risk Management Framework

Hull, [Risk Management and Financial Institutions](#), Fifth Edition, Ch's 27, 29

Aswath Damodaran, [Risk Management: A Corporate Governance Manual](#), SSRN 2010

Peter L. Bernstein, [Against the Gods: The Remarkable Story of Risk](#), Ch's 12, 13

#### **Week 2 and 3 Financial risks (September 14 and 19, 21 and 26)**

- Types of Financial Risk: Market, Credit, Liquidity, Contagion
- Volatility and risk
- Venues: Firms, Markets and Instruments, System, Cross border
- Risk management tools
- Portfolio construction, hedging, risk transfer

**Class visitors:** Colin Teichholtz, Element Capital, September 19

Til Schuermann, Oliver Wyman, September 26

**Required Reading:**

*Week 2*

James Lam, [Enterprise Risk Management: From Incentives to Controls](#) (Wiley Finance) 2nd Edition, 2014, Ch 12, p 175-180; 187-189; Ch 13, p 209-224.

Cecchetti and Schoenholtz, Ch 7 (Interest rate risk)

Bookstaber, [The Volatility Paradox](#)

*Week 3*

[OFR 2012 Annual Report](#), Chapter 2, pp. 10 – 12, and Box B

Jorion 2009, [Risk Management Lessons from the Credit Crisis](#), p. 1-10

Bao, J., David, J., and Han, S. [“The Runnables,” FEDS Notes, September 3, 2015](#)

Kodres, [“What is shadow banking?”](#)

R Herring and T Schuermann, [Objectives and Challenges for Stress Testing](#), January 2020, esp. pp 25-31

Andrew Hauser, [From lender of last resort to market maker of last resort via the dash for cash - why central banks need new tools for dealing with market dysfunction](#), Thomson Reuters Newsmaker, London 7 January 2021

FSOC, [2021 Annual Report](#), Executive Summary, 9-18

**Optional reading:**

*Week 2*

Hull, Ch 8 (hedging; p 161-174); 10 (Volatility-213-220; 222-228), 11 (Correlations-243-248), 12 (VaR and ES-269-283), 19 (Credit-431-439); Ch 22 (Stress tests – 497-511); Ch 24 (Liquidity – 537-562)

JP Morgan [2021 Annual Report](#), pp 85-154

Edward Altman, [Covid-19 and the credit cycle](#), *Journal of Credit Risk*, 16(2), 1–28

*Week 3*

Bank of England, [Financial Stability Report - July 2022](#)

Federal Reserve, [2022 Supervisory Stress Test Methodology](#) - March 2022

Cecchetti and Schoenholtz, [SEC Money Market Fund Reform Proposals Fall Far Short, Again](#), January 28, 2022

Cipriani, Martin and McCabe, [Pricing Liquidity without Preemptive Runs](#), Liberty St Economics, Jan 31, 2022

Brownlees, Christian T. and Robert F. Engle, [“SRISK: A Conditional Capital Shortfall Measure of Systemic Risk,”](#) *The Review of Financial Studies*, vol. 30, no. 1, p. 48-79, January 2017.

Eugene Fama and Kenneth French [The Cross-Section of Expected Stock Returns](#), *Journal of Finance* 1992

John Cochrane, Fishing [https://www.youtube.com/watch?v=3J\\_uV1TL0Qo](https://www.youtube.com/watch?v=3J_uV1TL0Qo)

Cochrane, Factor Mimicking Portfolios and Fishing  
[https://www.youtube.com/watch?v=2Od0cpN5\\_vo](https://www.youtube.com/watch?v=2Od0cpN5_vo)

## In Class Quiz Sept 28

### **Week 4 and 5 Cyber/operational and fintech risks (Sept 28 and October 3; October 5 and 12)**

- Cyber on firms
- Cyber on governments
- Other op risks: Financial crime, supply chain
- Data: Big and otherwise
- Fintech and Digital Assets: Benefits and Risks
- Portfolio construction, hedging, risk transfer

**Class visitors:** *Phil Venables, Google Cloud, October 3*  
*Mona Harrington, Assistant Director, CISA, October 12*

## Required Reading

*Cyber/Operational Risks*

RiskNet, [Top 10 Operational Risks for 2022](#)

James Lam, [Enterprise Risk Management: From Incentives to Controls](#) (Wiley Finance) 2nd Edition, 2014, Ch 14

FS ISAC, "[Navigating Cyber 2021](#)"

FS ISAC, "[Strengthen Your Firm's Defenses Against Ransomware](#)"

Sasha Romanosky, Lillian Ablon, Andreas Kuehn, Therese Jones, [Content analysis of cyber insurance policies: how do carriers price cyber risk?](#) *Journal of Cybersecurity*, Volume 5, Issue 1, 2019, tyz002, p. 21-31

*Big Data/Fintech/Digital Assets*

Haldane, [Will Big Data Keep its Promise?](#) 19 April 2018

Brainard, "[The Opportunities and Challenges of Fintech.](#)" 2016

## Optional reading

*Cyber/Operational Risks*

Phil Venables blog <https://www.philvenables.com/>

[Phil Venables: Risk Management is not only about Reducing Risk - Updated.](#)

[VRI Cyber Resilience Conference](#) April 2020; see in particular the following two papers:

White House Fact Sheet: "[Ongoing Public U.S. Efforts to Counter Ransomware.](#)"

Steve Silberstein, CEO of FS-ISAC. [Think global to fight cyber crime](#)

Hilary J. Allen, "[Payments Failure.](#)" SSRN, [Video](#)

Federal Reserve, [Information Technology Guidance](#)

Bank of England, [Financial Sector Continuity](#), including CBEST

## *Big Data/Fintech/Digital Assets*

FinRegLab, [FAQs: AI in Financial Services](#), 2020

BIS, [Central bank digital currencies: foundational principles and core features](#), October 2020

BIS, 2021 Annual Report Ch III, [CBDCs: an opportunity for the monetary system](#), June 2021

CRS, [Central Bank Digital Currencies: Policy Issues](#) July 21, 2021

### [BIS Innovation Hub publications](#)

Senate Banking Committee, "[Stablecoins: How Do They Work, How Are They Used, and What Are Their Risks?](#)" Hearings, December 14, 2021

Brainard, [What Are We Learning about Artificial Intelligence in Financial Services?](#), November 2018

Money, Banking and Financial Markets, [Crypto-assets and Decentralized Finance: A Primer](#), May 13, 2022

....., [TradFi and Defi: Same Problems, Different Solutions](#), May 30, 2022

, [Stablecoin: The Regulation Debate](#). December 13, 2021

....., [Central bank digital currency: The battle for the soul of the financial system](#) 08 July 2021

Wharton Blockchain and Digital Asset Project, [DeFi Beyond the Hype: The Emerging World of Decentralized Finance](#), May 2021

## ***Week 6 and 7 Climate-related risks (October 17 and 19, 24 and 26)***

- Climate science basics
- Risk management
- Disclosure and ESG
- Case studies
- Portfolio construction, hedging, risk transfer

***Class visitors:*** *Bob Litterman, Kepos Capital, October 19*

*Allison Herren Lee, NYU Law, October 26*

## **Required Reading**

### *Week 6*

Joseph Romm, [Climate Change: What Everyone Needs to Know](#), Ch's 1, 3.

CFTC, [Managing Climate Risk in the U.S. Financial System: Report of the Climate-Related Market Risk Subcommittee, Market Risk Advisory Committee of the U.S. Commodity Futures Trading Commission](#), Executive Summary, i-ix

Task Force on Climate-related Financial Disclosures, [2021 Status Report](#), Executive Summary 1-10.

FSOC, [Report on Climate-Related Financial Risk](#), October 21, 2021, Executive Summary, 3-9

PRA [Climate Change Adaptation Report 2021 - Climate-related financial risk management and the role of capital requirements](#), Executive Summary, vi-xi

Jean Pisani-Ferry, [Climate Policy is Macroeconomic Policy, and the Implications Will Be Significant](#), August 2021

Diego Kanzig, [The Unequal Economic Consequences of Carbon Pricing](#), January 2022

#### Week 7

IMF, [Climate Change Dashboard](#)

Giglio, Stefano and Kelly, Bryan T. and Stroebel, Johannes, [Climate Finance](#) (see conference videos in VRI link below)

Deloitte, [Executive Summary of the SEC's Proposed Rule on Climate Disclosure Requirements](#) (March 21, 2022; Last Updated March 29, 2022)

Four Twenty Seven, [Using Climate Data](#), April 2018

Center for Sustainable Business [ROSI™ Methodology](#)

#### Optional reading

[GARP's climate website](#) provides useful information; see [Climate Survey](#)

Joseph Romm, [Climate Change: What Everyone Needs to Know](#), Ch's 2, 4.

IPCC, [Managing the Risks of Extreme Events, and Disasters to Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change](#), 2012, Summary for Policymakers (pp. 3-21)

IPCC, [Climate Change 2021, Sixth Assessment, The Physical Science Basis, Summary for Policymakers](#), 4-6

VRI conference, "[A Financial Risk Framework For Climate Change: Portfolio Construction, Stress Testing, and Risk Transfer](#)" Friday, April 30, 2021

McKinsey Global Institute, [Climate risk and response: Physical hazards and socioeconomic impacts](#), January 2020, Executive Summary

George Metcalf, [On the Economics of a Carbon Tax](#), *Brookings Papers on Economic Activity*, Spring 2019

Webinar: [Climate Scenario Analysis: Guidance from the NGFS and CFRE](#), GARP and the Bank of England

Congressional Research Service, [Attaching a Price to Greenhouse Gas Emissions with a Carbon Tax or Emissions Fee: Considerations and Potential Impacts](#) March 22, 2019

Kent D. Daniel, Robert B. Litterman and Gernot Wagner, [Applying Asset Pricing Theory to Calibrate the Price of Climate Risk](#), NBER Working Paper 22795

SEC Commissioner Lee, [Climate, ESG, and the Board of Directors: "You Cannot Direct the Wind, But You Can Adjust Your Sails"](#), June 28, 2021

Lawrence A. Cunningham, [The Proposed SEC Climate Disclosure Rule: A Comment from Twenty-Two Professors of Law and Finance](#), July 6, 2022

John Coates, [Comment Letter on the SEC Proposed Rule](#), June 2022

Tensie Whelan, [How to Quantify Sustainability's Impact on Your Bottom Line](#), HBR, 2017

Kevin Eckerle, Tensie Whelan, Bryan DeNeve, Sameer Bhojani, John Platko, Rebecca Wisniewski, [Using the Return on Sustainability Investment \(ROSI\) Framework to Value Accelerated Decarbonization](#), *Journal of Applied Corporate Finance*, June 2020

Robert Engle, Stefano Giglio, Heebum Lee, Bryan Kelly, Johannes Stroebe, [Hedging Climate Change News](#), *Review of Financial Studies*, March, 2020

Signe Krogstrup and William Oman [Macroeconomic and Financial Policies for Climate Change Mitigation: A Review of the Literature](#), IMF Working Paper, September 4, 2019

Brainard, [Financial Stability Implications of Climate Change](#)

Prudential Regulatory Authority, [Enhancing banks' and insurers' approaches to managing the financial risks from climate change](#) April 2019 Supervisory Statement | SS3/19

Bank of England, Discussion Paper, [The 2021 biennial exploratory scenario on the financial risks from climate change](#), December 2019

Financial Conduct Authority and Prudential Regulatory Authority, Climate Financial Risk Forum, [Guide: Summary](#), June 2020

Patrick Bolton and Marcin Kacperczyk, [Global pricing of carbon-transition risk](#), 2021

### ***In-class Exam 1: October 31***

#### **Week 8 and 9 Geopolitical risks (November 2, 7 and 9)**

- Many facets to geopolitical risk
- What to do about it?
- Geopolitical vs. Political vs. Sovereign Risk
- Combatting the Financing of Terrorism (CFT)
- Case studies
- Portfolio construction, hedging, risk transfer

***Class Visitors:*** Heidi Crebo-Rediker, *International Capital Strategies*, November 2  
Eileen Fahey, *Chief Risk Officer, Fitch Ratings*, November 9

#### **Required Reading**

Eurasia Group, [Top Risks 2022](#), Overview

BlackRock [Geopolitical Risk Dashboard](#)

IMF, [Anti-Money Laundering/Combating the Financing of Terrorism \(AML/CFT\)](#)

Scott R. Baker, Nicholas Bloom, Steven J. Davis, [Measuring Economic Policy Uncertainty](#), *The Quarterly Journal of Economics*, Volume 131, Issue 4, November 2016, Pages 1593–1636

[Economic Policy Uncertainty Index](#)

[Brunswick Geopolitical](#)

[Sigma Ratings](#)

#### **Optional reading**

Dario Caldaia, Matteo Iacoviello, Patrick Molligo, Andrea Prestipino, and Andrea Raffo, [Does Trade Policy Uncertainty Affect Global Economic Activity?](#) Feds Notes, 2019

Bryan Kelly, Leland Bybee, Asaf Manela, Dacheng Xiu, [“The Structure of Economic News,”](#) September 2019

Robert F Engle and Susana Martins [“Measuring and Hedging Geopolitical Risk,”](#) SSRN October 2020

Geoffrey Miller, *The Law of Governance, Risk Management and Compliance*, Second Ed. Wolters Kluwer, Chapters 4 and 14 (at Bobst)

### **Week 10 and 11: Pandemic Risks (November 14 and 16, 21 and 28)**

- History: Evolution, Public Health and Resilience, Health Economics
- Macroeconomic and Financial Impact and Policy Responses
- Planning for the future – Improving Public Health, Vaccination, Pandemic Stress Tests

**Class Visitor** *Dr. Elodie Ghedin, NIH/NIAD, November 16*

*Dr. Celine Gounder, NYU Grossman School, November 28*

### **Required Reading**

CRS, [U.S. Health Care Coverage and Spending](#), January 2021

WHO, [Coronavirus Disease](#)

Johns Hopkins, Coronavirus Research Center, <https://coronavirus.jhu.edu/>

Sergio Correia, Stephan Luck, and Emil Verner, [“Fight the Pandemic, Save the Economy: Lessons from the 1918 Flu,”](#) Federal Reserve Bank of New York *Liberty Street Economics*, March 27, 2020.

Julian Kozlowski, [COVID-19: Scarring Body and Mind](#), St Louis Fed, 2020

Ford Foundation, [Reimagining a Sustainable Restaurant Industry in New York WHERE ALL STAKEHOLDERS THRIVE](#), Executive Summary

NYT, [Delta Variant Widens Gulf Between ‘Two Americas’: Vaccinated and Unvaccinated](#), July 14, 2021

Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis, [Don’t Force People to Come Back to the Office Full Time](#), HBR, August 24, 2021

### **Optional Reading**

Correia, Sergio and Luck, Stephan and Verner, Emil, [Pandemics Depress the Economy, Public Health Interventions Do Not: Evidence from the 1918 Flu](#) (June 5, 2020).

CEPR, [Covid Economics: Vetted and Real Time Papers](#) Four are:

Jean-Marie Meier and Jake Smith, The COVID-19 bailouts, 83

Christos A. Makridakis and Jonathan T. Rothwell, The Real Cost of Political Polarization: Evidence from the COVID-19 Pandemic.

Luboš Pástor and M. Blair Vorsa, Mutual fund performance and flows during the COVID-19 crisis, Covid Economics 38.

Michael Gapen, Jonathan Millar, Blerina Uruçi and Pooja Sriram, Assessing the effectiveness of alternative measures to slow the spread of COVID-19 in the United States Covid Economics 38.

Viral V. Acharya and Sascha Steffen, [“Stress Test” for Banks as Liquidity Insurers in a time of COVID](#), March 2020

EY, [How COVID-19 impacted supply chains and what comes next](#), 2021

Kendra Dougherty, MS; Mike Mannell, MPH; Ozair Naqvi, MS; Dakota Matson, MS; Jolianne Stone, MPH, CDC, [SARS-CoV-2 B.1.617.2 \(Delta\) Variant COVID-19 Outbreak Associated with a Gymnastics Facility — Oklahoma, April–May 2021, Early Release/ July 9, 2021 / 70](#)

CBO, [The Effects of Pandemic-Related Legislation on Output](#), September 2020

Wendy Edelberg and Louise Sheiner, [The Macroeconomic Implications of Biden’s \\$1.9 Trillion Fiscal Support Package](#), Brookings January 2021

Thomas Wright and Colin Kahl, [Aftershocks: Pandemic Politics and the End of the Old International Order](#), Brookings 2021

Katie Bach, [New data shows long Covid is keeping as many as 4 million people out of work](#), August 24, 2022

### **Week 12: Interplay (November 30; December 5)**

- Interconnectedness, contagion and spillovers
- Interplay among the five pillars of risk
- Case studies

*No visitor this week*

### **Required Reading**

Yellen, Janet L., [“Interconnectedness and Systemic Risk: Lessons from the Financial Crisis and Policy Implications”](#), speech at the American Economic Association/American Finance Association Joint Luncheon, San Diego, California, January 4, 2013.

Kara, Gazi, Mary Tian and Margaret Yellen, [“Taxonomy of Studies on Interconnectedness”](#), FEDS Notes, July 31, 2015.

Darrell Duffie and Josh Younger, [“Cyber Runs”](#), Hutchins Center Working Paper #51, June 2019

Jason Healey, Patricia Mosser, Katheryn Rosen, Alexander Wortman, [The Ties that Bind: A Framework to Assess the Linkage Between Cyber Risk and Financial Stability](#), December 2018

NGFS, [Macroeconomic and financial stability Implications of climate change](#), July 2019, Introduction 3-4

Schwebel, Michael, [Is There a Link Between Climate Change and Global Pandemics?](#), GARP, August 18, 2020

### **Optional reading**

DTCC, [Interconnectedness Revisited](#), May 2022

Bernanke, Ben, "[Clearinghouses, Financial Stability, and Financial Reform](#)," At the 2011 Financial Markets Conference, Stone Mountain, Georgia, April 4, 2011

Allen, Franklin and Douglas Gale, "[Financial Contagion](#)," *Journal of Political Economy*, vol. 108, no. 1, p. 1-33, February 2000.

Glasserman, Paul and H. Peyton Young, "[Contagion in Financial Networks](#)," *Journal of Economic Literature*, American Economic Association, vol. 54, no 3, September 2016, pages 779-831.

Bell, Sarah and Henry Holden, "[Two defaults at CCPs, 10 years apart](#)," *BIS Quarterly Review*, December 2018.

Berner, Cecchetti and Schoenholtz, "Stress Testing Networks: The Case of Central Counterparties," in [Handbook of Financial Stress Testing](#), Farmer, Kleinnijenhuis, Schuermann, and Wetzler, ed., Cambridge University Press, 2022; [NBER Working Paper No. 25686](#), Issued in March 2019; [SSRN](#)

Obstfeld, Maurice and Alan Taylor, [International Monetary Relations: Taking Finance Seriously](#), *Journal of Economic Perspectives*—Volume 31, Number 3—Summer 2017—Pages 3–28

Obstfeld, Maurice, [The global capital market reconsidered](#), *Oxford Review of Economic Policy*, Volume 37, Number 4, 2021, pp. 690–706

Kovner, Thomas M. Eisenbach and Michael Junho Lee, [Cyber Risk and the U.S. Financial System: A Pre-Mortem Analysis](#) Number 909 January 2020

Steven Cecchetti and Kim Schoenholtz, [Cyber Risk, Financial Stability and the Payments System](#), July 26, 2020

Patrick Bolton, Morgan Despres, Luiz Awazu Pereira Da Silva, Frédéric Samama, Romain Anna Svartzman, [The green swan: Central banking and financial stability in the age of climate change](#), Banque de France, January 2020

### **Week 13 Policy Implications (December 7 and 12)**

- Resilience
- Crisis Fighting
- Other risks: Fintech, Cryptocurrencies, Conduct and Culture
- Who should address these risks?

***Class Visitor:*** Kathryn Judge, Columbia Law School, December 7

### **Required reading**

*Resilience:* Macropru, OLA, incentives:

Brookings, [Report of the Task Force on Financial Stability](#), June 2021, Introduction, 6-20

G30, [U.S. Treasury Markets: Steps Toward Increased Resilience](#), July 2021, Introduction, 1-7

Don Kohn, [Building a more stable financial system: Unfinished business](#), August 27, 2021

Lorie Logan, [Monetary Policy Implementation: Adapting to a New Environment](#), October 14, 2021

Gruenberg and Tucker, [FT op-ed](#) (2012);

Benoît Cœuré, [The known unknowns of financial regulation](#), PIIE, October 2017

*Crisis Fighting:* Geithner, "[Are We Safer? The Case for Strengthening the Bagehot Arsenal.](#)"

*Monetary Policy:* Ben S. Bernanke, [Monetary Policy in a New Era](#), Brookings Institution October 2, 2017

*Other risks:* Dudley, [Strengthening Culture for the Long Term](#)

### **Optional reading:**

Hanson, Kashyap and Stein, "[A Macroprudential Approach to Financial Regulation](#)," 2011

Hubbard and Kohn, [Brookings Report of the Taskforce on Financial Stability](#), June 2021

G30, [U.S. Treasury Markets: Steps Toward Increased Resilience](#), July 1, 2021

Lorie Logan, [Liquidity Shocks: Lessons Learned from the Global Financial Crisis and the Pandemic](#), August 11, 2021

David Aikman, Andrew G Haldane, Marc Hinterschweiger and Sujit Kapadia, [Rethinking financial stability](#), Staff Working Paper No. 712 February 2018

FSB, [Framework for Post-Implementation Evaluation of the Effects of the G20 Financial Regulatory Reforms](#)

Nellie Liang, "[Higher capital is not a substitute for stress tests](#)" Brookings

Adrian et al, "[Macroprudential Policy: Case Study from a Tabletop Exercise](#);"

Powell, [Relationship Between Regulation and Economic Growth](#);

Tobias Adrian and Nellie Liang, "[Monetary Policy, Financial Conditions and Financial Stability](#)," Staff Report 690;

Tobias Adrian, Federico Grinberg, Nellie Liang, Sheheryar Malik, [The Term Structure of Growth-at-Risk](#), Brookings December 2019

Jeremy Stein, "[Overheating in Credit Markets: Origins, Measurement, and Policy Responses](#)" FSB, [Policy Proposals to Enhance Money Market Fund Resilience: Consultation report](#), June 2021

Dan Awrey and Kathryn Judge, [Why Financial Regulation Keeps Falling Short](#), February 2020 [GAO Financial Technology Report](#); pp 3-12;

[The Goals and Strategies of Financial Regulation](#), Chapter 3 in Armour, et al

Anna Kovner, Thomas Eisenbach, Andrew Haughwout, Beverly Hirtle, David Lucca, and

Matthew Plosser, "[Supervising Large, Complex Financial Institutions: What Do Supervisors Do?](#)" [Economic Policy Review](#), 2017 Issue 23-1, pp. 57-77

AIR, [A Regtech Manifesto](#); Redesigning Financial Regulation for the Digital Age, Introduction 5-12

Zetsche, Dirk A., Ross P. Buckley, Janos N. Barberis, and Douglas W. Arner, [Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation](#), *Fordham Journal of Corporate & Financial Law*, Volume 23, Number 1 2017 Article 2

BIS, [Policy responses to fintech: a cross-country overview](#)

FSB, [Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors](#), April 2018;

Group of 30, [Banking Conduct and Culture: A Call for Sustained and Comprehensive Reform](#), 2015

Global Foreign Exchange Committee, [FX Global Code](#), July 2018

[Treasury Market Practices Group: 10 Years of Best Practices](#)

***December 16-22 Final exam period (Tentative exam date is xxx)***

## Tentative Class Schedule

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Visitors/ Live Section</b>	<b>Assignments</b>
Pre-class	August	Review		Complete online survey
1	September 12	Introduction to Risk Management	Keishi Hotsuki, <b>1, 2</b>	
2	September 19	Financial risks	Colin Teichholtz, <b>1</b>	<i>Take home Practice exam</i>
3	September 26	Financial risks	Til Schuermann, <b>2</b>	
4	October 3	Cyber/operational risks	Phil Venables, <b>2</b>	<b>Quiz</b>
5	October 12	Cyber/operational risks	Mona Harrington, <b>1</b>	
6	October 24	Climate-related risks	Bob Litterman, <b>2?</b>	
7	October 26	Climate-related risks	Allison Herren Lee, <b>1</b>	
8	<b>October 31</b>	<b>In-class Exam 1 (75 minutes)</b>		
8	November 2	Geopolitical risks	Heidi Crebo-Rediker, <b>1</b>	
9	November 9	Geopolitical risks	Eileen Fahey, <b>2</b>	
10	November 16	Pandemic Risks	Elodie Ghedin, <b>1+2?</b>	
11	November 28	Pandemic Risks	Celine Gounder, <b>1</b>	
12		Interplay		
13	December 7	Policy Implications	Kathryn Judge, <b>1+2?</b>	
	<b>Dec 16-22</b>	<b>Final Exam – XX (Tentative)</b>		