Climate Finance: An Economic and Financial Approach to Climate Change (FINC-GB 2347)

Update September 30, 2021

Meeting Times: KMEC Room: 4-120, W, 6.00 PM – 9.00 PM

TA: Ammon Lam (asl664@stern.nyu.edu); Office hours by Zoom via Appointment

Office Hours: Wednesdays, 5pm – 6pm on Zoom, by Appointment

Course Description: Climate change presents one of the central challenges of our generation, with a wide range of effects on financial markets and the broader economy. At the same time, financial markets play an important role in financing the transition to a net-zero economy. In this class, we study the interaction between climate change and firms, financial markets, energy markets, and regulators/policy makers.

Given that climate change and sustainability issues more generally are affecting nearly every aspect of the corporate, regulatory and non-profit worlds, the class will be valuable for students with a wide range of backgrounds and career goals, whether they are directly interested in sustainability issues or primarily want to gain a better understanding of how these issues influence more traditional roles in the corporate and financial sector.

The class is very applied in its outlook—for example, I will invite a variety of guest speakers from the corporate and non-profit worlds—but we will frame the analysis through the lens of economic frameworks that help students think through the interactions between climate change and the broader economy in a systematic way. The objective is that the broad selection of topics and guest speakers will provide a variety of complementary perspectives on how climate change will shape economics and finance over the coming decades.

Professor: Johannes Stroebel (johannes.stroebel@nyu.edu)

Johannes Stroebel is the David S. Loeb Professor of Finance and the Boxer Faculty Fellow at the New York University Stern School of Business. At NYU, Professor Stroebel is the director of the Climate Risk initiative at the Volatility and Risk Institute. He joined NYU in 2013 from the University of Chicago Booth School of Business, where he was the Neubauer Family Assistant Professor of Economics.

Professor Stroebel conducts research in climate finance, household finance, social network analysis, and real estate economics. He has won numerous awards, including the AQR Asset Management Institute Young Researcher Prize and the Brattle Award for the best paper published in the Journal of Finance. He has also won an Alfred P. Sloan Research Fellowship in Economics. Professor Stroebel is an Associate Editor at the Journal of Political Economy, the Review of Economic Studies, Econometrica, and the Journal of Finance. Professor Stroebel is also a member of the Climate-Related Market Risk Subcommittee at the Commodities and Futures Trading Commission (CFTC).

Professor Stroebel read Philosophy, Politics, and Economics at Merton College, Oxford, where he won the Hicks and Webb Medley Prize for the best performance in Economics. He earned a Ph.D. in Economics at Stanford University, where he held the Bradley and Kohlhagen Fellowships at the Stanford Institute for Economic Policy Research.

Class Topics

More specifically, in this class, we will:

i. Understand the science of climate change, and analyze the effect of climate change on the overall economy.
ii. Explore the effects of climate change on prices and risks across a variety of asset classes, with a particular focus on equities, fixed income, energy, real estate, and mortgage-based assets.
iii. Study the risks and opportunities that climate change hold for firms and financial institutions, including firms in the energy sector (both hydrocarbon and renewables).
iv. Discuss how financial markets can help transfer and hedge climate risk as well as finance the transition to a net-zero economy.
v. Analyze the causes and effects of the growth of sustainable/ESG investing.
vi. Explore the economic and financial foundations of potential climate regulations, including emissions trading schemes.
vii. Discuss approaches of constructing the Social Cost of Carbon, including an understanding of the appropriate discount rates.
viii. Understand the design and effects of a variety of regulatory efforts such as stress tests for banks by policy makers in the US, Europe, and beyond.
ix. Discuss how climate change affect energy markets and the price of electricity in the short-run and long-run
x. Analyze how climate risk interacts with other risks, such as the risk of future pandemics and geopolitical risks.
xi. Discuss how sustainable infrastructure investments as well as climate adaption investments are important to combat and deal with climate change, in particular in urban settings.

MATERIALS

Since this is a very fast-moving area that is not traditionally taught in business, there is no required textbook for this course. Instead, I will be posting required and optional readings ahead of every class on NYU Brightspace. These will include newspaper articles, academic research papers and reports by industry groups, policy makers, and regulators.

EVALUATION

The class will have a midterm and final exam, which can cover all material discussed in class. A participation grade will also be awarded, with strong weight on active participation such as asking questions during the guest speaker visits (see below). The relative weighting of the components of the grade is:

Participation	20%
Midterm Exam	30%
Final Exam	50%

While the class will be recorded, the expectation is that students will attend the in-person sections.

GUEST SPEAKERS

This class will feature a variety of guest speakers from industry, academia, diplomacy, and regulatory agencies (including a number of Stern alumni). The confirmed guest speakers are listed below.

Most speakers will visit either during the time of the MBA section or the UG section, and students are required to attend presentations from speakers visiting the MBA section. You will also be invited to participate (likely remotely) in presentations from speakers in the UG section (see schedule below, they will be 3.30pm-4.45pm).

Due to uncertainties around Covid and university requirements, exact modalities of the presentations (e.g., in person or remote, etc.) will be determined closer to the time. I am hoping to also record the sessions with the permission of the speaker.

CLASS SCHEDULE

Wed, Sep 22	Class 1	Introduction to Climate Finance; The Science of Climate Change
Wed, Sep 29	Class 2	Physical and Transition Climate Risks
Wed, Oct 6	Class 3	Approaches to Hedging Climate Risk; Sustainable/ESG Investing
Wed, Oct 13	Class 4	**Guest Lecture by Joe Davis (Vanguard),** Climate Risk in Real Estate Markets I
Wed Oct 20	Class 5	**Guest Lecture by Chavon Sutton (Cambridge Associates)**; Climate Risk in Real Estate Markets II
Wed Oct 27	Class 6	Midterm Exam; **Guest Lecture by Scott Corwin (Deloitte)**
Wed Nov 3	Class 7	Cost-Benefit Analysis and the Social Cost of Carbon
Wed, Nov 10	Class 8	Climate Risk and Financial Stability; **Guest Lecture: Ilya Khaykin (Oliver Wyman)**
Wed, Nov 17	Class 9	Regulatory Interventions; Climate Risk and the Energy Sector
Wed, Nov 24		THANKSGIVING BREAK
Wed, Dec 1	Class 10	Climate Risks and other risks; **Guest Lecture: Christian Hannemann (German Mission to the UN)**
Wed, Dec 8	Class 11	Climate Change, Cities, and Green Infrastructure; **Guest Lecture: Lia Cairone (C40 Cities)**
Wed, Dec 15	Class 12	Final Exam

UG SPEAKER SCHEDULE

Here is the schedule of guest speakers in the UG class; these will be 3.30pm-4.45pm. If there is interest, I will send around a Zoom link to participate in these events ahead of time.

Tue Oct 12	Class 10	**Guest Lecture**: Lukasz Pomorski (AQR)
Mon Nov 8	Class 12	**Guest Lecture:** Keith Breslauer (Patron Capital)
Wed Nov 10	Class 19	**Guest Lecture**: Kristian Blickle, Hyeyoon Jung (NY Fed)
Wed Nov 17	Class 21	**Guest Lecture:** Rui Dong (DE Shaw)
Mon Nov 22	Class 22	**Guest Lecture:** Alex Inkster (Kimmerich Partners)

CONFIRMED GUEST SPEAKERS

Joseph H. Davis

Chief Economist and Head of Investment Strategy Group, Vanguard

Mr. Davis is a principal and Vanguard's chief economist. He is also global head of Vanguard Investment Strategy Group, whose investment research and client-facing team conducts research on portfolio construction, develops the firm's economic and market outlook, and helps oversee Vanguard's asset allocation strategies for both institutional and individual investors. In addition, Mr. Davis is a member of the senior portfolio management team for Vanguard Fixed Income Group.

Mr. Davis frequently presents at investment forums and has published studies on a variety of macroeconomic and investment topics in leading academic journals. Mr. Davis earned a Ph.D. in economics at Duke University.

Lia Cairone

Deputy Director for North America, C40 Cities

Lia Cairone serves as C40's Deputy Director for North America. Lia joined C40 from the New York City Mayor's Office of Sustainability where she was responsible for leading the development and advancement of green building policies to further New York City's climate objectives.

In her role with the City, Lia spearheaded the development and passage of the Climate Mobilization Act, including Local Law 97, which requires large buildings to dramatically reduce their greenhouse gas emissions, and oversaw NYC's carbon trading study. Lia was the chief architect of the 1.5°C: Aligning New York City with the Paris Climate Agreement climate action plan and supported the development of NYC's 80 x 50 roadmap. She previously served as the New York City Advisor to C40, and has worked in the private sector in technology, marketing, film, and media, and as an advocate for sustainable development, climate action, and gender equality.

Lia received her Master of International Affairs from Columbia University's School of International and Public Affairs in climate and energy policy and Bachelor of Science from New York University's Leonard N. Stern School of Business

Rui Dong

Managing Director and Trader, Discretionary Energy, The D. E. Shaw Group

Rui Dong joined the D. E. Shaw Group in 2005, where she is a senior member of the Discretionary Energy team, which primarily trades crude oil, natural gas, refined products and power markets.

Dong is involved in trading both directional and relative-value opportunities, including calendar and cross-commodity spreads. Additionally, she leads research initiatives both within the energy team and as part of collaborative firm-wide projects, working to stay on top of shifts in energy market dynamics both tied to macro considerations, such as geopolitical and policy factors, and based on the firm's bottom-up research and analysis. Recent energy-related themes have included increased interconnectivity of US and global natural gas markets, US shale production dynamics, international fuel import/export patterns, and post Covid-19 mobility patterns. She also mentors new hires and is active in the firm's DESCO Women affinity group, whose activities include lunch-and-learn conversations, after-hours social events, and hosting prominent speakers.

She has a BA in Computer Science and Economics from Harvard University

Alex Inkster

Partner, Kimmeridge

Alex Inkster is a Partner at Kimmeridge, a private equity firm based in New York and Denver focused on the development of low-cost unconventional oil and gas assets in the US upstream energy sector. At Kimmeridge, Mr. Inkster is responsible for the firm's direct investments.

Prior to this, Mr. Inkster worked as a Senior Equity Research Associate for Global Integrated Oils at Sanford C. Bernstein, covering 18 of the largest integrated oil companies and refiners. Before joining Sanford C. Bernstein, Mr. Inkster worked at General Electric, completing the company's financial management program and working in the Energy and Oil & Gas divisions.

Mr. Inkster holds a first class honors degree in Economics from University College London and is a CFA Charterholder.

Scott Corwin

Senior Managing Director, US Leader for Sustainability & Climate Change, Deloitte

Scott Corwin is a Senior Managing Director with Deloitte LLP in New York and is the Deloitte US Leader for Sustainability & Climate Change. His responsibilities include serving as:

- US Chief Sustainability Officer where he manages the firm's transition to operate at Net Zero by 2030.
- US S&CC Practice Leader where he oversees the work of 110k+ professionals across Deloitte's US Accounting & Audit, Advisory, Consulting and Legal & Tax businesses assist clients transition their organizations to a low carbon future.
- Ambassador for Global Planetary Impact Initiatives that the firm is undertaking to reduce atmospheric carbon.

Over a 30+ year distinguished career in consulting, Scott has worked closely with senior leaders and Boards of global organizations to successfully undertake strategy-based transformations to address disruptive change in their sectors, markets, and communities. He has worked with clients across a wide range of sectors address a broad span of issues. He is a widely recognized expert in shaping the emergence of new ecosystems through forging innovative partnerships with corporations, governments, academia, communities, and NGOs.

Scott previously led the firm's Global Future of Mobility Practice. Under his leadership, Deloitte has been working closely with corporations, governments, academia, communities and NGOs to actively shape the emergence of the mobility ecosystem. Through their work with innovators and incumbents, their partnership with the World Economic Forum, extensive research (70 published articles) and presentations at scores of global forums (including at The Vatican), they have been advancing the concept that the adoption of seamless, intermodal mobility could enable more people and goods to move faster, safer, cleaner, cheaper and with greater accessibility, inclusivity and equity.

Prior to joining Deloitte in 2014, he was a Partner at Booz Allen Hamilton/Booz & Co. (2002-2014) and a Partner with AT Kearney (1994-2002) in the NYC.

Scott earned his BA Magna Cum Laude and with High Honors in Politics from Brandeis University and his MBA in Finance and International Business from New York University Stern School of Business.

Scott and his wife, Elizabeth, reside in New York City & Bridgehampton. They have two adult children, Harrison & Amelia, both professionals who also reside in New York City.

Chavon Sutton

Senior Investment Director, Sustainable & Impact Investing Research, Cambridge Associates

Chavon is a senior investment director in the Sustainable & Impact Investing Research Group at Cambridge Associates, conducting manager research and working with institutional clients to build sustainability- and impact-focused portfolios. She joined Cambridge in 2020 with over 10 years of finance experience.

Prior to joining Cambridge Associates, she was the first Director of Emerging Manager Strategy for NYC's Bureau of Asset Management, the investment advisor to each of the city's five retirement systems. There, she led its growth strategy for investment in small, diverse and women-owned managers across all asset classes, created its first blueprint for the integration of diversity factors in its investment process, and supported the investment staff's sourcing and due diligence efforts. Previously, Chavon was a Vice President at J.P. Morgan where she constructed and managed portfolios for families, endowments and foundations totaling over $150m in investable assets. She began her career in corporate finance roles at Bank of America and RBC, underwriting debt transactions for Fortune 500 financial institutions.

She holds a Bachelor’s degree in Economics (cum laude) from the University of Pennsylvania, and a Masters of Arts in Journalism and a Masters of Business Administration from New York University.

Kristian S. Blickle

Economist, Federal Reserve Bank of New York

Kristian Blickle is a Financial Economist in the Financial Intermediation Function at the Federal Reserve Bank of New York, where he works, among other issues, on climate finance topics. His research interests include banking, household finance, real estate finance, and corporate finance (with a focus on entrepreneurial activity). He received his Ph.D. from the University of St. Gallen in Switzerland in 2018, and was a visiting PhD student in the NYU Stern finance group.

Christian Hannemann

Diplomat, German Permanent Mission to the United Nations

Christian Hannemann is in charge of climate, environment, and migration at the Permanent Mission of Germany to the United Nations in New York. In that role he covers the international coordination of climate action in New York as part of the UNFCCC process as well as the global security implications of the effects of climate change. This field, "climate and security", was a key issue of Germany's term as an elected member of the UN Security Council in 2019-2020. Germany's role as co-chair the "Group of Friends on Climate and Security", the main forum for UN member states to discuss climate-related security risks remains a major part of Christian's work.

A career foreign service officer, Christian previously served at the German Embassy in Baghdad, where he led on political and economic affairs, and at the German Embassy in Kabul, where he coordinated stabilisation efforts. Before joining the diplomatic service, he worked as a political affairs officer with the United Nations in New York, as an advisor to the Afghan Ministry of Finance in Kabul, and in the private sector as a management consultant based in Berlin. Christian studied history, politics, and international relations in Oxford, Berlin and New Delhi and holds degrees from Oxford University and Freie Universität Berlin.

Ilya Khaykin

Partner, Oliver Wyman

Ilya Khaykin is a Partner at Oliver Wyman in the Risk & Public Policy practice and heads the Americas FS Climate platform, based in New York. Ilya advises major financial institutions on risk and financial management topics including stress testing, capital management, resolution planning, credit risk, liquidity risk, interest rate risk, political risk, and climate-related risks.

Ilya worked with the United Nations Environment Programme – Finance Initiative (UNEP FI) to develop the leading approach to climate risk scenario analysis for banks. Ilya is currently working with the World Economic Forum on how the finance industry can help finance the transition to a net zero carbon future, as well as with the IMF on integration of climate risk into financial sector stability assessment. In addition, Ilya works with numerous banks in North America and Europe on climate risk management, climate scenario analysis and net zero targets and portfolio alignment.

Ilya joined the firm following his completion of postgraduate studies at the London School of Economics and the Institut d'Etudes Politiques de Paris in November of 2006. He earned his Bachelor's degree in Applied Physics with a minor in Electrical Engineering from Columbia University. He is fluent in French.

Keith Breslauer

Managing Partner - Patron Capital

Mr Breslauer is Managing Director and Senior Partner of Patron, which he founded in 1999. The business has since evolved into one of the leading opportunistic real estate managers in Europe with €3.4 billion across five Funds. He began his career at Lehman Brothers where he assisted in creating and leading the Principal Finance Group. In 1997 he left Lehman Brothers to create the business which a year later became Patron.

Mr Breslauer is active in many charities including acting as Trustee for the Royal Marines Charity, the Co-Chairman of the European Supervisory Board of Chicago Booth (University of Chicago) and Advisory Committee Member for the Social Enterprise Initiative, Governor of North London Collegiate School, Chairman and Trustee of the Prince's Teaching Institute (Prince's Trust) and Senior Patron to many other charities.

Mr Breslauer is a Guest Lecturer at Harvard Business School, Chicago Booth, Said Business School (University of Oxford) and Imperial College.

He has an MBA from Chicago Booth ('88) and a BSc from NYU School of Business and is an accomplished alpinist and skier.

Hyeyoon Jung

Financial Economist, Federal Reserve Bank of New York

Hyeyoon Jung is a Financial Economist at the Federal Reserve Bank of New York.

Her research interests are international finance, financial intermediation, asset pricing, and climate finance. Her primary research interests regard understanding the impact of frictions in financial intermediaries on asset prices and real economies.

She received her Ph.D. in Finance from NYU Stern, B.S. in Economics from UPenn Wharton, and B.AS from the School of Engineering and Applied Science. Prior to graduate school, she worked as an FX & Rates trader at J.P. Morgan.

Lukasz Pomorski

Managing Director and Head of ESG Research – AQR Capital Management

Lukasz Pomorski is the Head of ESG Research and a Managing Director at AQR Capital Management. He is responsible for the planning and oversight of the firm’s responsible investment research efforts across all asset classes.

Lukasz frequently publishes on ESG topics, serves on industry committees and speaks at conferences globally. He is a member of the United Nations Principles for Responsible Investment Hedge Fund Advisory Committee and was previously the chair of UN PRI's Equity Hedge Fund Working Group. Prior to AQR, Lukasz was an Assistant Director for Research at the Bank of Canada and an Assistant Professor of Finance at the University of Toronto. Lukasz earned a B.A. and M.A. in economics at the Warsaw School of Economics, an M.A. in finance at Tilburg University, and a Ph.D. in finance at the University of Chicago.