

Syllabus

Course title	CLIMATE FINANCE
Instructor:	Alex Stomper
Email	alex.stomper@hu-berlin.de
Office hours	by appointment
Credits	2 US credits (4 ECTS credits)
Module	Financial Management
Term	Winter Term AY 2022/2023
Course level	MSc
Prerequisites	None
Course drop	As described by the Regulations of the MS in Finance program

1. Course description

This course explores the connections between climate change (global warming) and the financial system. Climate change causes **risk**“uncertainty” and our societies must adapt. This is directly relevant for the financial system because this system connects risk-takers (speculators) with risk-avoiders. How can we use financial markets in order to deal with risks associated with climate change? What are the risks? How do they correspond to the different categories of “financial” risks?

Given that the financial system performs key functions in economic adaptation to climate change, we can expect that prices in financial markets contain **information** about climate change. Can we use the prices to „value“ policies for mitigating climate change? What does the financial market tell us about the social cost of greenhouse gas (GHG) emissions?

How can the financial system contribute to economic adaptation to climate change? Sustainable finance requires distinguishing between risks of financial and economic distress, where financial distress means a risk of insolvency which is purely caused by a temporary lack of cash („liquidity“) while economic distress means that a certain type of economic activity becomes unsustainable. As a (by definition) temporary phenomenon, the weather causes risks of financial distress in non-financial firms, while the climate (and climate policy) will cause economic distress. This can happen not only because of effects on firms` **cash flows**, but also because of changes in investors` **valuations** of the cash flows. For example, heavily polluting firms may become “distressed” when their stock prices drop and they end up looking over-indebted and no longer credit-worthy. What determines the valuation of more or less polluting firms in a financial market in which some investors shun the stocks of heavy polluters?

We will address these questions while distinguishing between different types of “**players**” in the financial system: investors, asset managers and index funds, banks, and central banks/financial supervision authorities. Climate change and climate policy confronts these different players with different questions. Here are some examples:

1. How should environmentally concerns investors structure their portfolios?
2. Should index funds pressure firms to reduce their GHG emissions?

3. Should banks refuse to accept polluting assets (e.g., coal-fired power plants) as collateral for loans?
4. Should banks be required to use more equity capital for financing their loans to heavily polluting firms?

2. Learning outcomes

<i>Core Learning Area</i>	<i>Learning Outcomes</i>
<i>Interpersonal and communication skills.</i>	Discussing some “politically charged” topics regarding climate change and climate policy, as well as the role of the financial system in climate policy.
<i>Technology Skills</i>	
<i>Quantitative Reasoning</i>	Interpreting evidence regarding effects of climate change on financial markets
<i>Critical Thinking</i>	Assessing whether/how the financial system should climate policy
<i>Management knowledge and skills</i>	Risk management

3. Reading list

See point 7, below.

4. Teaching Method and Learning Activities

Lectures, quizzes, videos.

5. Assessment

15% Participation in class

35% Exam

50% Term paper

6. Technical/laptop requirement

Please bring a laptop in order to participate in online quizzes

7. Course schedule and materials for each session

The following outline describes the structure of the course. I also list some introductory references. The course will be based on a much more extensive set of references, cited in the course materials. References in italics are core references which should be read before class. These references are mostly about empirical analyses. The theoretical background of these analyses will be discussed in class.

The class will meet on six days, with two lectures per day, the topics of which are listed below

(under points 1 – 6).

- 1 **(i) Introduction to climate change for economists (– key risks/”uncertainties”)**
(ii) Key events in climate policy

Chen, J, et al., 2020, [EU Climate Mitigation Policy](#), IMF.

Hsiang, S., and R. E. Kopp, 2018, [An Economist's Guide to Climate Change Science](#), Journal of Economic Perspectives.

- 2 **(i) Asset pricing and “pricing the planet’s future”**
(ii) Key tools of climate policy (– should “finance” be part of the toolkit?)

Bolton, P., Z. Halem, and M. Kacperczyk, 2022, [The Financial Cost of Carbon](#), Journal of Applied Corporate Finance.

Bolton, P., A. Lam, and M. Muuls, 2023, Do Carbon Prices Affect Stock Returns?, Working paper.

Giglio, S. B. Kelly, and J. Stroebe, 2021, [Climate Finance](#), Annual Review of Financial Economics.

- 3 **(i) Weather risk in financial markets (– weather shocks and cash flows)**
(ii) Climate change in financial markets (– climate change and discount rates)

Custodio, C., M. A. et al., 2022, [How does Climate Change affect Firm Sales? Identifying Supply Effects](#), Working paper.

Pagano, M., C. Wagner, and J. Zechner, 2022, [Disaster Resilience and Asset Pricing](#), Working paper.

Schlenker, W., and C. A Taylor, 2021, [Market Expectations of a Warming Climate](#), Journal of Financial Economics.

Pastor, L., R.F. Stambaugh, and L. A. Taylor, 2022, [Dissecting Green Returns](#), Journal of Financial Economics.

- 4 **Carbon accounting and corporate finance**

P. Akey, and I. Appel, 2020, [The Limits of Limited Liability: Evidence from Industrial Pollution](#), The Journal of Finance.

Bartram, S., K. Hou, and S. Kim, 2022, [Real Effects of Climate Policy: Financial Constraints and Spillovers](#), Journal of Financial Economics.

Bolton, P., et al. 2022, [Mandatory Carbon Disclosure and the Path to Net Zero](#), Management and Business Review.

- 5 **(i) Green factor investing, hedging climate change**
 (ii) Climate change and bond markets

Alekseev, G., et al., 2022, [A Quantity-Based Approach to Constructing Climate Risk Hedge Portfolios](#), Working Paper.

Pastor, L., R.F. Stambaugh, and L. A. Taylor, 2022, [Dissecting Green Returns](#), Journal of Financial Economics.

- 6 **(i) Green financial intermediation and financial regulation**
 (ii) Climate change and central banking

Baumgartner, S., et al., 2023, Banking on Snow: Bank Capital, Risk, and Employment, Working Paper.

Bolton, P., et al., 2020, [The Green Swan](#), BIS.

Boneva, L., G. Ferruci, and F. P. Mongelli, 2022, To be Green or Not to Be “Green”: How can Monetary Policy React to Climate Change?, Working Paper.

Oehmke, M., and M. Opp, 2022, Green Capital Requirements, Working Paper.

8. Brief Bio of Instructor

Alex Stomper serves as the Professor of Financial Economics at Berlin’s Humboldt University, one of the German “Exzellenz-Universitäten”. He is a graduate of the University of Vienna, and a founding faculty of the Vienna Graduate School of Finance. Before moving to Berlin, he taught at MIT’s Sloan School of Management and at Vienna’s Institute of Advanced Studies.

In Berlin, he directs the [ISQD research](#) group working at the intersection of climate finance and data science.