

*Preliminary Course Outline*

# **Credit Risk**

**NYU Shanghai January Term 2023 –SHBI-GB.7732.B10**

**MEETING ROOM – Zoom**

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## Aims and Objectives

Fuelled in part by burgeoning growth in the credit derivatives market in late 90's, the market in credit expanded dramatically for 10 years till 2Q 2007. After the financial crisis 2008/2009, bond markets continued this trend reaching record levels in 2020. Both, post-financial crisis and post-COVID outbreak, central bank and government interventions around the world, in particular quantitative easing, had a major impact on bond markets. Parallel to bond markets, other credit markets such as the leveraged loan market grew exorbitantly as well and with it its largest investor Collateralized Loan Obligations. As central banks embark on monetary tightening, these markets – including government bond markets – of advanced economies are coming under significant stress.

The increased activity levels in credit markets have led to a much greater research focus on credit and one of the features of this work has been the high degree of complementarity between the research carried out by academics and by practitioners, for example, the investment banks and rating agencies.

The credit derivatives market was at the heart of the global financial and economic crisis, having contributed substantially to it by affecting lender incentives once loans were securitized, allowing banks to “game” regulatory capital requirements, and creating opacity due to their over-the-counter (rather than centralized or exchange-based) trading infrastructure. While the market for credit derivatives underwent a significant transformation as a result, a part of its underlying rationale in terms of risk transfer from banking sector to the rest of the economy remains robust.

In the meanwhile, however, we had a sovereign debt crisis in Western Europe, which highlighted an important nexus between sovereign and financial sector (especially bank) balance-sheets and recently, there are signs of stress due to fiscal and illiquidity issues even in developed economy markets (US, Japan, UK, ...). Credit derivatives can be used with powerful effect to study this nexus and understand its root causes as well as consequences.

The objective of the course is to provide an introduction as well as an in-depth understanding of single-name derivative products, primarily the single-name credit default swaps (CDS), as also index products, with a focus on sovereign CDS index products. In addition, we will discuss other forms of credit derivatives such as Collateralized Loan Obligations, which issue bonds backed by a basket of leveraged loans.

As with any derivatives course, the idea is to learn the key arbitrages between derivatives and cash markets well so that one knows when *the arbitrage breaks down!* Hence, the objective is to provide a balance between developing, on one hand, a sound conceptual framework and, on the other, market understanding and insight, especially with respect to liquidity and counterparty risk effects that are often so important in markets from a practitioner's standpoint. I regard both as essential to the informed practitioner and academic.

We will apply the tools by studying signs of market stress during the COVID-19 crisis and how Fed interventions alleviated the market turmoil in that period. In particular, the liquidity in the markets for government bonds will become important to understand as well, especially as COVID stimulus is being withdrawn.

Along the way, we will look at methods to quantify the systemic risk of the financial sector and regulatory as well as market-based stress-testing of financial firms. Finally, we will also pay some attention to the ongoing concerns around zombie lending to corporates by bond markets given the Quantitative Easing by central banks both pre-COVID and post-COVID.

Overall, I want to enable students with using credit derivatives markets as a tool – a barometer of sorts – to understand macro events such as sovereign and financial sector crises, and their inter-linkages. It should be fun and I welcome you to the journey!

## Topics Covered

- Historical default and recovery experience in credit markets and the COVID context
- Introduction to single-name credit derivatives (corporate, sovereign, ...)
- No-arbitrage relationship between underlying bond markets and credit default swaps
- Behavior of CDS-bond basis during 2008-09 global financial crisis and European debt crisis
- Basket default products and index tranches with a focus on sovereign credit index products
- Sovereign debt crisis in the Eurozone – Understanding its various dimensions
- Measuring and managing systemic risk, and stress tests of the financial sector
- Zombie lending and its implications for the post-COVID world
- Systemic risk in government bond markets of developed economies: the post-COVID context

## Format and Teaching Methods

The classes will include discussions around empirical facts about credit, lectures on key no-arbitrage relationship between credit derivatives and underlying bond markets, and the use of credit derivatives in understanding the nexus between sovereign and financial sector balance-sheets (crises). Primary reading material will be my slides and handouts. Anything else that is relevant will be circulated over email to the class mailing list. Depending on evolving conditions in credit markets, I may schedule a guest lecture or two on an interesting topical theme.

## Reading Materials

Besides my lecture notes and distributed readings, I recommend reading before the course starts, Chapter 0: Overview [TS], and during the course, Chapter 14: Corporate Debt and Credit Default Swaps [TS].

[TS] Tuckman and Serrat (2022): *Fixed Income Securities: Tools for Today's Markets*

More details about issues related to government bond markets during the COVID pandemic can be found in [FSB].

[FSB] Financial Stability Board (2022): *Liquidity in Core Government Bond Markets*

## Assessment

The grade for the course will be based on a take-home final exam which will require you to conduct credit analysis of an individual sovereign bond market and the related credit derivatives market based on methods learnt in the course. The final exam must be done in groups of four each. This will determine 80% of your grade each. There will also be 20% credit for class participation and bringing to the classroom discussion relevant themes from on-going sovereign and financial credit risk issues at time of the course. Please take class attendance seriously and enrich the classroom experience for yourself and others. No auditing is allowed unless approved by the Registrar's office.

## Academic Integrity

Our undergraduate [Academic 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 Academic Integrity Policies](#) as well as 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 violations 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 Stern Code of Conduct and Judiciary Process applies to all students enrolled in Stern courses.

For graduate students, information can be found here:  
<https://www.stern.nyu.edu/uc/codeofconduct>.

For undergraduates, information can be found here:  
<https://www.stern.nyu.edu/portal-partners/current-students/undergraduate/community/com>.

To help ensure the integrity of our learning community, prose assignments you submit to NYU Brightspace 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

(<https://www.stern.nyu.edu/portal-partners/registrar/policies-procedures/general-policies/code-conduct>)

(<https://www.stern.nyu.edu/portal-partners/current-students/undergraduate/academics/academic-policies>) and the NYU Student Conduct Policy

(<https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-student-conduct-policy.html>)

## Grading Guidelines

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 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. If you will need to take an exam at the Moses Center for Student Accessibility, you must submit a completed Exam Accommodations Form to them at least one week prior to the scheduled exam time to be guaranteed accommodation. For more information, visit the CSA website: <https://www.nyu.edu/students/communities-and-groups/student-accessibility.html>

## Student Wellness

Our aim is for students to be as successful academically as they can, and to help them overcome any impediments to that. Bookmark the NYU Stern Well-being Resource Hub (<https://www.stern.nyu.edu/wellbeing>) for existing services at NYU and Stern covering a wide variety of topics including financial well-being, relationship well-being, mental well-being and more. Any student who may be struggling and believes this may affect their performance in this course is urged to contact the Moses Center for Student Accessibility (see also the Student Accessibility section of this syllabus) at 212-998-4980 to discuss academic accommodations. If mental health assistance is needed, call the NYU's 24/7 Wellness Exchange hotline 212-443-9999. Furthermore, please approach me if you feel comfortable doing so. This will enable me to provide relevant resources or referrals. 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 preferred pronouns this way. Please utilize this link for additional information: [Pronouns & Name Pronunciation](#).

## Religious Observances and Other Absences

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.

## Laptops, Cell Phones & Other Electronic Devices

The use of electronic devices (e.g., tablets or laptops), for the purpose of note-taking only, is permitted. However, students should make every effort to avoid distracting their classmates or disrupting the class, including arriving early and choosing a seat that is less distracting for peers.

## Inclusion Statement

*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.*

| <b>Class<br/>(Date-<br/>Shanghai time)</b> | <b>Topic</b>                                                                                                                                                                                                                                                                    | <b>Guest Lecture<br/>(TBC)</b>                              |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1<br>(January 3)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• Introduction to credit risk: historical default and recovery experience on corporate and sovereign debt</li> <li>• The COVID context</li> </ul>                                                                                        |                                                             |
| 2<br>(January 4)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• Introduction to single-name credit derivatives</li> </ul>                                                                                                                                                                              |                                                             |
| 3<br>(January 5)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• The changing nature and regulation of credit derivatives: CDS auction mechanism</li> </ul>                                                                                                                                             | Satish Mansukhani<br>(Top-ranked<br>bond market strategist) |
| 4<br>(January 6)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• No arbitrage relationship between single-name credit default swap (CDS) and bonds</li> <li>• Behavior of CDS-Bond basis during Crisis episodes (global financial crisis, European sovereign debt crisis, COVID, post-COVID)</li> </ul> |                                                             |
| 5<br>(January 8)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• Climate change and corporate/municipal debt</li> <li>• Collateralized Loan Obligations (CLOs)</li> <li>• Basket credit default products and index tranches – focus on sovereign indices</li> </ul>                                     | Abhishek Bhardwaj<br>(Tulane University)                    |
| 6<br>(January 9)<br>8:30am-12:30pm         | <ul style="list-style-type: none"> <li>• Basket credit default products and index tranches (continued)</li> </ul>                                                                                                                                                               |                                                             |
| 7<br>(January 15)<br>9:00am-12:00pm        | <ul style="list-style-type: none"> <li>• Sovereign debt crisis in the Eurozone – Understanding its various dimensions and especially the nexus with the banking sector (see the summary diagram below)</li> </ul>                                                               | Lee Seltzer<br>(NY Fed)                                     |
| 8<br>(January 16)<br>9:00am-12:00pm        | <ul style="list-style-type: none"> <li>• Sovereign debt crisis in the Eurozone (continued)</li> </ul>                                                                                                                                                                           |                                                             |

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|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 9<br>(January 17)<br>9:00am-12:00pm  | <ul style="list-style-type: none"> <li>Measuring and managing systemic risk of the financial sector</li> <li>Stress-testing the financial sector and implications for sovereign credit risk</li> </ul>                        | Hyeyoon Jung<br>(NY Fed)      |
| 10<br>(January 19)<br>9:00am-12:00pm | <ul style="list-style-type: none"> <li>Implications of Quantitative Easing on corporate bond market</li> <li>COVID and post-COVID issues: Liquidity in US/UK treasuries and the role of central bank interventions</li> </ul> | Matteo Crosignani<br>(NY Fed) |
| (January 31)                         | <b>Final exam: Project assessing the nexus of credit risk of a <u>sovereign and its financial sector</u> due</b>                                                                                                              |                               |

## Summary

