

Project Lab Proposal Form

The University of Chicago's Master of Science Program in Financial Mathematics (MSFM) partners with companies through the Project Lab course (FINM 36000), to provide students with hands-on research experiences, putting knowledge gained from the classroom into practice.

You can find additional details, along with FAQs within the Project Lab Company Guide: <https://uchicago.app.box.com/s/p4d37a28doxsh8xlm6dap2lwt2gd8f33>

If you would like to propose multiple projects, please complete a new proposal form for each project.

If you have any questions, please contact Sue Clark at sueclark@uchicago.edu.

The respondent's email (karima.kenny@nb.com) was recorded on submission of this form.

Email *

karima.kenny@nb.com

Company name (and division/division/departments/desk, if applicable): *

Neuberger Berman

Physical address of organization: *

190 S. LaSalle St, 24th Floor

URL and/or description of organization: *

NB.com

How many teams is your organization sponsoring for this project? *

1

Up to six students may be assigned to your team. If you would prefer a different number, please indicate so here.

Company Representative name: *

Karima Kenny

Company Representative title: *

Chief Administrative Officer

Company Representative email address *

karima.kenny@@nb.com

If applicable, additional Company Representative name(s), title(s), and email(s):

Ajay Jain, Head of FI Quantitative Strategies, Ajay.Jain@nb.com

Are any representatives also alumni of the University of Chicago? If yes, please indicate their name and applicable degree program:

Aside from the initial briefing meeting and the final presentation, how often will the team meet with the representative(s) to deliver progress reports and receive advice? *

weekly

Will such discussions be face-to-face, or by some form of teleconferencing? If face-to-face, will the meetings be at your company site, on-campus, or some other arrangement? *

Zoom Meetings

Will the team members be required to sign non-disclosure agreements? *

Yes

Project topic/title: *

Private Credit - Residential

Background motivation of the project:

Non-Agency Mortgages present a unique modeling challenges compare to Residential Mortgages.

Skills required (e.g. programming languages/software packages/statistical models or tools, etc.): *

Machine Learning, Big Data knowledge and Modeling skills

Project objectives or questions to be investigated: *

Using data from structured and unstructured mortgage performance and macro economic data to train machine learning to quantify prepayment performance and credit risk

The private residential credit team is looking to expand modeling capabilities across its \$9B residential credit investment business, with a primary focus on non-agency residential mortgages. Mortgages in this sector present a unique modeling challenge due to the distinction in factors that drive performance versus conventional mortgages. Modeling this problem will entail utilizing very large volumes of structured and potentially unstructured mortgage performance and macroeconomic data to train machine learning models quantifying prepayment and credit risk. These modeling capabilities will allow the team to run more robust scenario cashflow projections that drive pricing, credit vetting, and general portfolio evaluation.

Completing this project will first entail storing and structuring data to be compatible with modeling goals. A transition model that maps a probability matrix of movements across states will then be fit using machine learning classification modeling. Relevant state transitions include the mortgage prepaying, going delinquent, curing, etc. The aforementioned probability model will enable production of loan-level cash flows under varying economic scenarios. Metrics from these cash flows will inform investment decisions at a loan and portfolio level.

Students may add this project lab to their resume, including the company name and a general description of their research (abiding by any applicable NDA). We advise they use the following format:

Company Name

Quantitative Researcher - University of Chicago Project Lab

General description of research

Please note below if you prefer something different.

Any additional comments: