NBER Digital Economics and AI Tutorial

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Yunyue Chen
PhD Candidate in Economics, Ghent University
Faculty of Economics and Business Administration
Ghent 9000, Belgium
Email: Yunyue.Chen@UGent.be
Website: https://sites.google.com/view/yunyuechen/home

Graduate education and doctoral training

I am a PhD candidate in Economics at Ghent University, specializing in financial intermediation and the economics of information. I entered the doctoral program in 2022 and expect to complete my PhD in June 2027. My doctoral research examines how digital information affects borrower assessment, loan contracting, and the allocation of credit. I combine granular lending data with empirical methods that connect changes in lenders' information to their assessments of borrowers and the contracts they offer.

My academic background comprises a BSc in Mathematics and Applied Mathematics from Jiangsu University and an MSc in Quantitative Finance from New York University's Stern School of Business, completed in 2021. During my doctorate, I have undertaken visiting research appointments at the National University of Singapore, NYU Shanghai, NYU Stern, and HEC Paris. I am currently a Research Trainee in Financial Supervision at Deutsche Bundesbank. My research uses panel econometric methods, including difference in differences and event studies, alongside prediction exercises and machine learning methods where the research question concerns the information content of credit assessments.

Research interests

My research agenda concerns how digital technologies change the information available to financial intermediaries and their ability to use it. I focus on small business lending and consumer credit, where limited public disclosure and differences in lenders' knowledge make information central to financing decisions. The overarching question is how improvements in information expand the set of borrowers that lenders can evaluate and alter the allocation of credit across locations and industries.

I distinguish two related dimensions of digital change. The first is the availability and verifiability of information. Digital business records can make economic activity easier to document and assess, potentially reducing lenders' dependence on geographic proximity and accumulated local knowledge. My job market paper studies this dimension through a reform that strengthened invoice verification. The second is the processing of information. Even when lenders observe borrowing histories, they may benefit from standardized assessments produced by specialized intermediaries. My research on credit scores examines the information contained in these assessments and the extent to which it can be recovered from observable records.

Together, these projects motivate my interest in digital economics and AI. They raise questions about when access to data and improvements in prediction substitute for existing informational advantages, when they reinforce the role of specialized intermediaries, and which borrowers benefit. I aim to assess these mechanisms through economically meaningful outcomes, including loan terms, the reach of lending, and the composition of selected loan portfolios.

Current research projects

Invoice digitalization and small business lending

My job market paper, "Hard Information and Local Lending Markets: Evidence from Invoice Digitalization," examines whether verifiable business records can substitute for the soft information underlying small business lending. I exploit the staggered provincial rollout of China's Golden Tax Phase III reform, which strengthened the verification of invoice records used in credit assessment. The analysis uses 154,233 loan originations from multiple banks between 2012 and 2022. These records link banks' income assessments and internal evaluations of repayment capacity to approved contracts, borrower distance, and industry characteristics.

The empirical design compares lending outcomes around the reform's implementation using variation in its timing across provinces. Following implementation, approved credit lines increase by approximately 20 percent and interest rates fall by roughly 40 basis points. The central finding concerns the role of prior information: distance penalties weaken in both banks' assessments and loan terms, while banks with less prior industry specialization expand approved credit more.

The geographic and sectoral reach of lending also broadens. Lending distance increases by about 14.5 percent, and banks' local portfolios cover approximately 1.4 additional industries at the one digit level. These findings connect changes in borrower assessment to the markets that banks serve. They indicate that verifiable hard information is especially valuable where lenders initially have less knowledge of borrowers, helping explain how information infrastructure can change the geography and industry composition of credit.

The paper's contribution is to trace information substitution through both internal assessments and approved lending outcomes. This evidence informs my broader research on how digital technologies change the geographic reach and industry composition of bank lending.

Credit histories and the value of scoring

A second project, "From Credit Histories to Loan Allocation: The Role of Credit Scores," asks why credit bureau scores remain useful when lenders can access borrowing histories. Using Indian vehicle loan records, the project examines supplied scores, observed credit history summaries, realized financing, and first installment nonpayment. It evaluates whether histories reproduce the repayment distinctions contained in bureau scores and whether those distinctions matter for selecting loans at a given portfolio capacity.

Scores and histories each improve repayment prediction beyond the other. Machine learning models can approximate bureau scores from observed histories, but the reconstructed scores do not retain all of the supplied scores' predictive value. Thus, success in approximating a numerical assessment need not imply equivalent performance in the economic task for which it is used.

The portfolio analysis compares retrospective selection rules within the observed pool of originated loans. It evaluates predictive screening value, without identifying a causal effect of adopting an algorithm on credit supply. The score's additional information may reflect inputs unavailable in the observed histories as well as differences in information processing. This distinction is central to my interest in the economics of AI: understanding the value of predictive technologies requires attention to the data they use, the judgments they produce, and the decisions those judgments inform.

Developing research and dissertation

Digital footprints and financial access

I am developing a further project on how firms' digital footprints affect financing and subsequent investment and employment. The project asks whether changes in the information available to lenders alter which firms receive credit and how those financing changes relate to real economic activity. I plan to link measures of firms' digital presence with lending records and firm outcomes to investigate these relationships.

This project extends my research from borrower assessment and loan contracts toward the consequences of information frictions for firms. An important challenge is to distinguish information about a firm from changes in the firm's underlying economic prospects. Addressing that distinction would help clarify when digital presence contributes to access to finance and when it primarily reflects characteristics that lenders already value. The project is at the development stage, and its empirical design will depend on the information and variation available in the linked data.

Dissertation overview and committee

My dissertation examines how the availability, verifiability, and processing of borrower information shape credit allocation. I organize the dissertation around the relationship between lenders' information, their assessments of borrowers, and the resulting terms and allocation of credit. The projects described above examine distinct aspects of this agenda, from the substitution of verifiable records for local knowledge to the incremental value of standardized credit assessments.

My dissertation committee consists of:

Chair: Professor Michael Frömmel, Ghent University.

Member: Professor Cecilia Parlatore, New York University, Stern School of Business.

Member: Professor Kose John, New York University, Stern School of Business.

Motivation for participating in the tutorial

I would value the NBER Digital Economics and AI Tutorial as an opportunity to develop the conceptual foundations of this research agenda and discuss its implications with researchers studying digital technologies across economic settings. My current empirical work examines how verifiable records change lending and how credit assessments improve screening. The tutorial would help me connect these findings to broader questions about the economics of prediction, the organization of information markets, and the allocation of gains from digital technologies.

A particular objective is to sharpen the distinction between improvements in access to data and improvements in the ability to extract useful judgments from those data. This distinction matters for interpreting the role of AI in financial intermediation. Better prediction may enable lenders to evaluate previously unfamiliar borrowers, while the value of predictive systems may also depend on access to information that remains concentrated among particular intermediaries. I would welcome feedback on how to formulate these mechanisms and evaluate their consequences for borrower access and market competition.

I would contribute experience with granular credit data and empirical research connecting borrower assessments to lending outcomes. Discussions with faculty and other doctoral researchers would help me refine the questions and empirical designs in my developing work. In particular, I would like to clarify when improvements in prediction expand credit access and when they primarily change which borrowers receive financing.