Statement of Research, Teaching, and Service  
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Research. The core of my research uses (static and dynamic) contract theory to study substantive economic questions—in particular, in Macroeconomics and Finance. My research focuses on environments where economic relationships are constrained either by the agents’ inability to commit to future actions, or by informational asymmetries. I address both normative and positive questions: How can these frictions be alleviated through the design of contracts? Do the properties of the contracts shed light on real-world phenomena?

My research thus far can be divided into two groups. The first set of papers seeks to understand the role of renegotiation across a wide variety of environments, from corporate to sovereign to consumer lending. The second group of papers analyzes how contracts should be structured when one agent’s unobservable effort affects the quality of information relevant for the decision making of other agents.

I. Renegotiation. Renegotiation is an important aspect of many economic phenomena. In a series of papers, I explore the impact of renegotiation on economic relationships. For instance, in Debt Contracts with Partial Commitment [1] (American Economic Review, 2013), I study the role of renegotiation in corporate debt contracts. In practice, renegotiations are extremely common. For example, they can be triggered by violations of debt covenants—contingencies in a contract that put restrictions on the borrower's activities. Thus, it is important to understand the economic role and effects of renegotiation. I analyze renegotiation in the context of a dynamic lending framework where the borrower cannot be forced to make repayments. I show that allowing for renegotiation fundamentally changes the nature of the contracting environment and the model predictions. In particular, having formal contracts that are renegotiated may be worse than having no contracts at all.

The literature typically makes one of two extreme assumptions about the lender’s ability to commit: either the lender has full commitment power (i.e., can commit to investment decisions for all future periods and contingencies), or cannot commit at all. I consider the more realistic intermediate case where there is some but not full commitment to contracts, i.e., formal contracts can be renegotiated. I model partial commitment by assuming that the parties sign a long-term contract, which in every period may be voided with some probability, in which case the lender offers a new contract. The model nests full and no commitment as special cases, where the probability is 0 and 1, respectively. But, is it important to study the partial commitment case? It is known that the extreme cases share many qualitatively similar predictions. Moreover, full commitment trivially leads to (weakly) higher social welfare relative to no commitment. The natural conjecture is that the case of partial commitment would also yield qualitatively similar predictions and would have welfare implications ‘in between’ the extreme cases. Surprisingly, I find that this is not the case. First, having more commitment by the lender can be worse for social welfare than having less commitment and, in particular, than having no commitment at all. Second, the long-run investment dynamics with partial commitment dramatically differ from the dynamics in the extreme cases of full and no commitment. Specifically, investment fluctuates over time and is positively related to cash flow. This is consistent with empirical findings.

The welfare result is quite subtle. With partial commitment, the lender can make use of his ability to commit not only along the equilibrium path, but also following a deviation. Thus, relative to the no-commitment case, it becomes harder to discipline the lender in equilibrium. This, in turn, can lead to a social welfare loss. This result is quite general, and can be applied to other environments where contractual enforcement is imperfect and thus interacts with self-enforcement. As a consequence, the contribution goes beyond this particular application.

Equilibrium Default Cycles [2] (with Balázs Szentes, Journal of Political Economy, 2007) studies renegotiation in a different context: sovereign rather than corporate debt. Countries often accumulate debts so large that they decide to go into default. As a result, they typically lose access to credit markets. After some time, often more than a decade, the country and its creditors renegotiate and achieve debt settlement. The country then regains credit market access. But as the country keeps accumulating debt, it eventually defaults again, and the cycle repeats. We build a model that explains these cycles and makes the time of exclusion from the credit market endogenous and potentially long. In our model, default cycles occur endogenously along every equilibrium path. After a sequence of bad shocks, the borrower accumulates more debt than the maximum surplus that any lender can extract from her. We call this state ‘debt overhang’. In debt overhang, no new lender wants to lend to the borrower, leading to the incumbent lender exercising monopoly power. The main
result is that, even though the incumbent could maintain this power forever, he chooses not to do so. Instead, he eventually chooses to renegotiate the size of the debt, and let the borrower regain access to the competitive market. Of course, the lender does this because it increases his profit. However, the reason it increases his profit is subtle. Suppose the borrower has high income. If the incumbent lender had full commitment power, he could extract this income by promising efficient investments in all future periods. Unfortunately, the lender cannot commit in this way. However, he can come closest to this by providing the borrower with access to the competitive credit market and, with it, access to more efficient investment decisions. Thus, when the borrower has sufficiently high income (after a sequence of good shocks), the incumbent reduces the borrower’s debt to a level at which she regains access to the competitive credit market in exchange for the borrower’s income today.

In our model, the occurrence of debt overhang is a statistical inevitability. The interesting and novel part of our explanation lies in the borrower’s return from debt overhang to the competitive credit market. The return, while also inevitable, is not merely a statistical phenomenon. It is instead an endogenously determined property of equilibrium behavior. Notably, in our model debt settlement occurs only after good shocks, in contrast to most existing papers. We show that this prediction is consistent with data. Furthermore, our model (when computed numerically) can account for a number of stylized facts on sovereign lending.

Screening as a Unified Theory of Delinquency, Renegotiation, and Bankruptcy [3] (with Igor Livshits, revised and resubmitted to the International Economic Review in April 2015) introduces renegotiation in yet a different context: consumer credit. Default in consumer credit has multiple stages. First, borrowers become delinquent—overdue on loan payments. Some, but not all, delinquent borrowers end up in bankruptcy. Lenders sometimes renegotiate with delinquent borrowers to prevent bankruptcy and achieve debt settlement. However, the majority of the literature focuses on bankruptcy, and for the most part abstracts away from delinquency and (especially) renegotiation. We show that there is a single friction—adverse selection—that gives rise to the three stages of default—delinquency, renegotiation, and bankruptcy. To show this, we build a parsimonious model where the borrower has private information about her endowment. Delinquency, renegotiation, and bankruptcy emerge as part of the optimal (screening) contract. In equilibrium, some borrowers choose not to repay, and thus become delinquent. The lender renegotiates with a fraction of delinquent borrowers. In the absence of renegotiation, delinquency leads to bankruptcy.

We use our model to study mortgages and foreclosures, and find that it matches key empirical regularities. For example, our model reproduces the “double-trigger” phenomenon—foreclosures are associated with both a negative home equity and a negative shock to the homeowner’s income. Furthermore, our mechanism generates amplification of house-price shocks through foreclosure spillovers. We also show that a government intervention aimed at limiting foreclosures that does not take into account private debt restructuring may have the opposite effect from the one intended. Thus the contribution of our paper is twofold: it outlines a simple mechanism that captures important stages of default in consumer credit markets, and sheds light on an application that is very important and relevant in light of the recent housing crisis.

There are many interesting open questions in consumer credit that I am excited to explore. Igor Livshits and I are interested in analyzing issues related to borrowing from multiple lenders. These include debt dilution (which arises at the borrowing stage) and debt consolidation (which arises at the repayment stage as a way of renegotiating with multiple lenders). The latter relates both to our earlier work on debt restructuring and to the under-explored topic of debt collection.

In [1], I assumed that renegotiations occur stochastically and exogenously. This was done for the purpose of tractability. But it has the drawback of not explaining what causes renegotiations, or why provisions such as debt covenants exist. Bargaining over Debt Covenants [4] (with Amanda Friedenberg, work in progress) takes the position that debt covenants serve to alter the nature of renegotiations. We study a dynamic environment where a lender and borrower negotiate and renegotiate debt contracts, which include a debt covenant. In the event of covenant violation, the lender can simply take control of the project. Throughout the relationship, the parties receive public information about the value of the project—they observe cash flows—but the borrower also receives private information about the value of the project—e.g., he can learn about the nature of the
project or his own ability to implement the project. The nature of the private information—i.e., information about project vs. information about ability—does not impact renegotiation without a covenant violation. But, the exact nature of the private information matters for renegotiation following a covenant violation, as it affects the lender’s outside option of taking control of the project. The goal in this project is to obtain predictions that are consistent with empirical observations on corporate debt contracts.

II. Information Acquisition with Moral Hazard. In many important economic settings, agents can improve the quality of information relevant for decision making of others by exerting costly effort. The effort, and how precise the information is, may not be observable. Information Acquisition, Moral Hazard, and Rewarding for Bad News [5] (with Hector Chade, 2nd round revision requested by the Journal of Economic Theory in May 2015) studies an environment where a client (principal) who searches for an opportunity of uncertain return and hires an expert (agent) to evaluate potential options. The agent’s unobservable effort affects the quality of information he receives about the options. Based on the information the agent provides, the principal compensates him and decides whether to exercise an option or to continue the search. Interactions of this sort abound in real-world applications. For example, think of an individual seeking to purchase a house, who hires a home inspector to provide her with information about houses that become available.

Our contribution is in deriving properties of the optimal contract. We show that when the prior belief that the option quality is high is below a threshold, the agent is rewarded for ‘bad news’ (about the option quality). Also, there is a range of prior beliefs for which it is impossible to implement effort, even though information might be most valuable in those scenarios. Interestingly, the principal may find it profitable to commit to an ex-post suboptimal random decision to exercise an option. Specifically, with some probability she will not exercise an option even though she receives favorable news about it from the agent, and exercising it would be profitable (ex-post). All of these results are novel in the literature, and specific to the considered environment.

The credit rating business is a natural and important setting where the quality of information is endogenous and affected by effort of a credit rating agency (CRA). Who Should Pay for Credit Ratings and How? [6] (with Anil Kashyap, Review of Financial Studies, conditional acceptance) was inspired by the debate on what led to inflated AAA ratings, which contributed to the financial crisis. It, however, takes on a more fundamental question: How should the rating business be designed? We address this question in the context of frictions that are important in the ratings business—namely, that the rating quality depends on the CRA’s unobservable effort and the CRA can misreport ratings. We analyze the optimal way to provide incentives to the CRA given these frictions. Crucially, this approach allows us to separate problems that come (i) from the fundamental frictions of the environment (moral hazard), (ii) from using one business model vs. another (such as issuer-pays vs. investor-pays), or (iii) from a badly-designed incentive scheme (that could potentially be eliminated with better contracting).

We compare settings where a social planner, the firm, or investors order a rating. We find that rating errors are larger when the firm orders a rating than when investors do (and both produce larger errors than is socially optimal). We also find that investors overuse ratings relative to the firm or the planner. Our model also explains a number of empirical observations in the rating business in a unified fashion. In particular, it explains delays in downgrading. The delays in our model arise due to a fundamental trade-off in providing time-consistent incentives that is embedded in the optimal compensation scheme (even under the planner). Thus, remarkably, such delays in downgrading are not inefficient—quite the opposite, they arise as part of an optimal arrangement.

There are many important and fundamental questions about the rating business that remain unanswered. For example, in a joint project with Marcus Opp, we seek to shed light on how rating structured products (such as collateralized debt obligations) differs from rating simple securities (such as corporate bonds) by explicitly modeling the differences.

Teaching. Being able to teach students something new and important is part of what I like about working in academia. I have taught two courses: Intermediate Macroeconomic Theory (ECN 313, Undergraduate) and Macroeconomic Analysis II (ECN 713, PhD Core).
My teaching philosophy in the undergraduate course is to maintain very high quality of teaching and high performance standards, while carefully guiding the students through the process. I devote a significant part of my lectures to presenting macroeconomic data and key stylized facts, and urge students to discuss and interpret them. I teach simple classical models that can be used to interpret those facts. To keep students engaged, I initiate discussions about model limitations and how one might change the model to incorporate potentially important features. More generally, I try to infect students with my passion for economics. To facilitate learning, I have developed presentation slides for my lectures. I solve plenty of practice problems in class, post ‘handouts’ and practice exams. But, I give challenging exam problems that are not just trivial modifications of the practice problems. This pushes students to try to really master the material. It is exciting to see a student’s satisfaction from learning something new and interesting about economics. I often receive feedback that my course is one of the most challenging and educating courses they have taken, and it makes my day!

As the PhD course is part of the first-year core sequence, my role as an instructor is particularly important. The objective is to teach students tools, classical papers in Macro, as well as key skills needed for conducting research. My background plays a big role in my approach to teaching. I studied Mathematics at one of the best Russian universities. The greatest thing I learned there was not Mathematics per se, but rather the ability to think analytically, in a structured and precise way. I teach my students the importance of being formal and precise. I teach them how to approach formulating and solving new problems, different from the ones they have seen before. After all, this is what they will have to do in their research. As a practical manner, before writing down, say, a key equation, I pause and ask the students to help me. I stimulate discussions. I give challenging exam problems that test, not only their knowledge of the material, but also critical thinking. The unifying theme of the course—recursive macro theory—goes hand in hand with my research interests. I devote significant time to teaching dynamic contracts with applications to Macro, the core of my research. I love teaching this course!

I maintain contact with my students after the course is over. I regularly give advice on what papers to read, what second-year courses to take, and give feedback on their research ideas. Because I know all of the students in the program, I seldom miss their talks at the department workshops—I want to know how they are doing with their research. In a way, they will always remain my students.

Service. I have always allocated a significant part of my time to providing services to ASU and the profession at large. When I first arrived at ASU, job candidates only had one formal outlet in which to practice their job talks. In 2009, I took the initiative to expand on this—organizing regular practice job talks with junior faculty members. I have been organizing these talks every year since. I single-handedly coordinate this process by soliciting junior colleagues’ attendance, carefully picking 3-5 people both in and outside of the candidate’s field to attend a mock presentation and give detailed feedback. This filled an important gap and significantly improved the preparation process of our students for the job market.

I am also heavily engaged in dissertation advising. I have actively served on dissertation committees of two students, Ran Shao (2011, Yeshiva University) and Zhan Li (2015, University of Winnipeg), and have been involved at every stage of their job market process. In addition, I am the primary adviser of Yong Kim (a 3rd-year student); he wrote his 3rd-year paper under my supervision and continues to work on his thesis under my supervision. While not on his committee, I also regularly advise Yang Yue (a 4th-year student).

I have been actively involved in faculty recruitment. I participate in the screening process of junior candidates, meet with them during campus visits, attend recruitment seminars and social events. I have also been actively involved in recruitment of new PhD students. I regularly review application files, and every year I am on the schedule for campus visits. I have served as member of Macro Qualifying Exam Committee since 2010. I served on the grade grievance committee in 2011/12. I attended convocation ceremonies several times.