Department of Economics
University of California, Berkeley
530 Evans Hall #3880
Berkeley, CA 94720-3880

March 18, 2012

Professor Thomas Hellmann
Coordinator, NBER ERBC
University of British Columbia
Sauder School of Business
2053 Main Mall, Vancouver, BC
Canada V6T 1Z2

Dear Professor Hellmann:

Enclosed please find my application to the 2012 NBER Entrepreneurship Research Boot Camp. I believe the camp will complement my current research, which studies questions about incentives for innovation, technology diffusion, and business entry – all of which are central to entrepreneurial activity. With my background in IO and Economic History (my second-year research fields), I believe I can bring a unique perspective to the camp, and if admitted, I am looking forward to the opportunity to bring ideas and papers from the camp to conversations with fellow students and colleagues at Berkeley.

My recommendation letter is being written by Ben Handel, Assistant Professor at UC Berkeley's Department of Economics, and separately emailed to Brett Maranjian.

I look forward to hearing from you about the status of my application. I can be reached by email at gross.daniel.p@gmail.com, by phone at (214) 769-7725, and by post at the above address. Thank you very much for your consideration.

Sincerely,



Daniel Gross

Enclosure

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF ECONOMICS
548 EVANS HALL #3880
BERKELEY CA 94720-3880
TELEPHONE: (510) 642-0822
FAX: (510) 642-6615

BENJAMIN R. HANDEL
ASSISTANT PROFESSOR OF ECONOMICS
EMAIL: *handel@Berkeley.EDU*
TELEPHONE:(510) 643-0708

March 17, 2012

To whom it may concern:

I am writing to recommend Daniel Gross, a current Ph.D. student at the University of California at Berkeley, for the NBER summer boot camp in entrepreneurship economics and entrepreneurial finance. Daniel would be a truly outstanding candidate and participant for this workshop, and I offer my highest recommendation for his candidacy for this prestigious opportunity.

I have gotten to know Daniel as a student in the Ph.D. course I teach in empirical industrial organization. Throughout the semester, Daniel has stood out among the students in terms of his ability to deeply explore important economic questions. Daniel is a lively participant in class where we engage in debates about the empirical content and methodological contributions of leading papers in industrial organization. In addition to illustrating exceptional ability, Daniel is very hard working. He reads the (quite substantial) list of required papers in advance of class each week, and always comes to office hours to discuss these papers, as well as his own research. I understand that this aspect is especially important for participants in the boot camp: I have no doubt that Daniel will thoroughly cover the 50+ papers given in advance of the workshop, and that, as a result, he will be an active and valuable participant.

As a second year Ph.D. student, Daniel's research is still in the formative stage, making him an ideal candidate for this kind of workshop. He has demonstrated clear interest in questions in industrial organization and entrepreneurship: Daniel's work on graphic design contests already shows an ability to think about micro-entrepreneurs in an empirical context. His work here integrates theoretical work on tournaments with a novel empirical data set that he has collected to study question on incentives and productivity. This work demonstrates his interest in the area, and already shows fantastic data gathering and analytical abilities. Especially in regards to work in entreprneurship, Daniel's ability to collect interesting and unique data can't be undervalued: in essence, I think research in entrepeneurship requires an entrepreneurial mindset: isolating data in this area and linking those data to interesting question requires creativity and persistence. In all three of the projects Daniel is working on he has assembled data in a careful and creative manner with an eye towards specific important questions.

Daniel's economic history work is also relevant for entrepreneurship and innovation. Daniel studies the diffusion of gasoline based tractors in the early 1900s and reveals that information about the innovation is very important on top of liquidity / cost constraints. While the topic he studies is in a historical setting, the diffusion of innovation is a core question in entrepreneurship economics. The distinction between information diffusion and cost-based diffusion is important, and can inform broader questions in economic policy and financial economics.

In addition, to working his ongoing research and formal coursework, I would like to note that Daniel has shown impressive initiative to learn about topics that are not being taught at Berkeley in formal courses. At the beginning of the semester, Daniel came to my office, and asked if I could help develop a mini reading course on empirical auctions and structural estimation of auction models. I gave Daniel the seminal theoretical book by Vijay Krishna in this area, as well as several comprehensive surveys on the auction literature (Hendricks and Porter, Athey and Levin). These are not easy topics to digest, especially without formal instruction. Daniel completed reading *all* of these materials in about two months, on top of his normal coursework and research, and through our discusions clearly has a strong understanding material. Through our interactions, this experience has perhaps most impressed me about Daniel.

Finally, on a personal level Daniel is a pleasure to be around. He is enthusiastic, thoughtful, and positive while always seeking to make progress on the dimensions approach to each setting he is in. I couldn't think of a better candidate for a rigorous introduction to the field of entrepreneurship, he will be a valuable participant.

Please don't hesitate to contact me with any additional questions about Daniel at the email address or phone number listed at the beginning of this letter.

Best regards,

Benjamin Handel
NBER Faculty Research Fellow
Assistant Professor of Economics
University of California at Berkeley
handel@berkeley.edu

DANIEL P. GROSS
curriculum vita

Department of Economics
University of California, Berkeley
530 Evans Hall #3880
Berkeley, CA 94720-3880

Phone: (214) 769-7725
Email: grossd@berkeley.edu

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY — Berkeley, CA
Doctor of Philosophy in Economics, expected May 2015 — 2010-2015
Fields: Industrial Organization, Economic History

TUFTS UNIVERSITY — Medford, MA
Bachelor of Arts, Summa cum Laude, May 2008 — 2004-2008
Major fields: Mathematics, Economics

WORK IN PROGRESS

To the Victor Belong the Spoils: Tournaments for graphic design services

Prize competition has recently seen tremendous growth in interest, number, and value, yet economic research has not firmly established how it operates in practice. In this project I use a unique dataset of over 8,000 graphic design contests to study contests outside of the lab, leveraging unpredictable, mid-contest rule changes (e.g., prize increases and deadline extensions) as natural experiments. In these contests, the sponsor publishes a prize structure and design guidelines, and designers compete to create the "best" design by a known deadline. The format allows players to make multiple, sequential bids and sponsors to provide players with real-time feedback on their bids. All bids and feedback are public information. At the conclusion of the contest, the sponsor picks the winning designs and receives the design files and the full rights to their use. Early results suggest that effort is increasing and concave in total purse and that players are more likely to enter and exert effort when the purse is concentrated in a single prize, raising questions about player overconfidence and perception of/preference for risk.

Regional expositions and the diffusion of tractors in the early 20th century

Since Griliches (1957) first recognized a logistic pattern of technology diffusion, innovation and technology diffusion have been important themes in economic research. The 20th century produced two revolutionary agricultural innovations: the gas tractor and genetically modified crops. The former enabled farmers to mechanize their harvest and reduce dependency on pack animals, thus freeing acreage for extra planting and reducing uncertainty around the labor inputs to farming (Olmstead and Rhode 2001). This project explores the importance of highly attended product demonstrations to the diffusion of the gas tractor in the early 20th century, using archived shipments data from four leading manufacturers of the era, county-level agricultural census data, and records from state fairs and other expositions.

PREVIOUS WORK EXPERIENCE

ABT ASSOCIATES, INC Bethesda, MD
Research Assistant 2009-2010
Economic and regulatory analysis of environmental policy issues, including profiles of demand for products containing toxic chemicals and the distribution of emissions allowances under the Waxman-Markey climate change bill (H.R. 2454, currently inactive).

KAISER ASSOCIATES, INC Washington, DC
Associate Consultant 2008-2009
Management consulting engagements in health information technology, medical device manufacturing, and electric utility industries.

FELLOWSHIPS, GRANTS & AWARDS

NSF Graduate Research Fellowship, 2011-2014
University of California Regent's Intern Fellowship, 2010-2014
Phi Beta Kappa, Tufts University, 2008
Robert C. Byrd Scholarship, U.S. DOE, 2004-2008
National Merit Scholarship, NMSC, 2004

MEMBERSHIPS

American Economic Association

OTHER SKILLS

Programming: Stata, Matlab, Python, Visual Basic, ArcGIS, HTML
Languages: English (native), Spanish (conversational)

Current and completed graduate coursework

General (first-year) courses

Math for Economists
Microeconomic Theory I
Microeconomic Theory II
Macroeconomic Theory I
Macroeconomic Theory II
Econometrics I
Econometrics II

Field courses in Industrial Organization

Empirical Industrial Organization
Computational Methods in IO
Independent study of auction econometrics

Field courses in Economic History

Intro to Economic History
Macroeconomic History

Other coursework

Applied Econometrics: Panel data
Applied Econometrics: Discrete choice
Reading group in applied theory

Reasons for applying

My reasons for wanting to attend the NBER Entrepreneurship Boot Camp are several. Based on past years' reading lists, the content of the camp is unlike anything I've seen in field courses. The program is an opportunity to explore how ideas from my "official" fields – Industrial Organization and Economic History – can be applied to topics in entrepreneurship and vice versa. I'm particularly excited about this opportunity, since my current research emphasizes questions that are important to entrepreneurs (like incentives for innovation, and the marketing and diffusion of new technologies; described below) and that I have so far only studied through the lens of these more traditional research fields.

I also think the boot camp will inspire new questions. I see the camp as an opportunity to meet other students and professors studying topics in entrepreneurship, learn from them, share ideas, and generate new ones. While I have some works in progress in this area, one of which I'm exploring as a potential thesis project, as a rising 3rd-year student I am not yet committed to a thesis and am open-minded about any new ideas that might arise from the camp. While the boot camp is in many ways a course or a reading group, I also see it as one big brainstorming session. In this sense I hope the camp will help me further develop my research agenda – whether by solidifying its current direction or steering it in a new one. The boot camp also presents an interesting opportunity to potentially partner with other participants.

Lastly, I talk regularly with friends in other fields, like labor economics and macro, and I think I can bring some of the ideas and papers from the boot camp to those conversations. In that sense, I am hoping the boot camp will have positive spillovers.

Current and future research

My current research studies questions about innovation, technology diffusion, and the competitive effects of business entry. My three current projects are empirical, drawing on unique datasets that I have independently compiled from primary sources over the last two years.

In "To the Victor Belong the Spoils: Tournaments for graphic design services", I study the effects of prize structure, contest difficulty, intensity of competition, and other environmental variables on entry and effort in prize competitions, using a dataset of over 8,000 graphic design contests hosted on a well-known website over a span of roughly two years.[1] In these contests, an individual or organization in need of a design posts a contest with a prize structure and design guidelines, and freelance designers compete to create the "best" design by a published deadline. At the conclusion of the contest, the sponsor picks the winning designs, pays the winners, and receives the design files and the full rights to their use.

I seek to understand how players decide which contests to enter and how much effort to exert. Specifically, my goal is to answer the following questions: (i) How does prize structure affect contest participation? (ii) How does design difficulty differentially affect entry and effort in the contest? (iii) How do players respond to competition? (iv) How do players respond to feedback and information about own ability? (v) Do players bid strategically, e.g. by timing their bids or bidding in bursts? To answer these questions and achieve identification I exploit a unique feature of the data, which is that contest sponsors can increase prizes, add prizes, change the design requirements, and extend the deadline mid-contest, without prior notice. These changes are unpredictable to the players (e.g., a sponsor comments that "a little more budget opened up") and thus effectively serve as natural experiments. Early results suggest that the aggregate effort of all players is increasing and convex in purse, whereas individual effort is concave in purse, indicating that a discouragement effect from increased competition may eventually crowd out the incentive effect of the larger purse. Players also tend to enter contests with larger first prizes relative to consolation prizes, possibly reflecting overconfidence. Larger prizes attract higher quality players, as measured by their performance record. I find that contest difficulty deters entry but *increases* effort, suggesting that once a player enters a contest, he commits to trying. Finally, I find rough evidence that

[1] The sample will likely soon grow to over 25,000 contests.

there are two types of bidders in the data: those who prefer to invest heavily in a few contests, and those who prefer to spread themselves thin across many contests.

Entrepreneurs participate as both buyers and sellers in this market. Anecdotally, I first learned of the contest market from a friend who used the website to source a logo and a website mockup for his startup company when it was months old.[2] Casual Googling reveals that contest sponsors range from established businesses, to startups, to Rick Warren and his latest book. The other side of the market, the designers, largely consists of freelancers, who are by definition entrepreneurs. The contest platform effectively democratizes the graphic design labor market, allowing anyone to compete, providing winners with an income, and creating a venue for workers to develop skills, demonstrate talent, and innovate.

The subject of prize competition is also of general interest. In the past few years, prize competitions have seen tremendous growth in interest, number, and value, and they are now widely used in business and government (see, e.g., the X-Prize Foundation, Innocentive, and Challenge.gov). While tournaments have an extensive theoretical foundation, they have been subject to only a handful of empirical studies outside the lab, most drawing on data from professional sports contests. The lack of non-experimental empirical work reflects wide variation in contest attributes and lack of large-sample data. My data resolve these problems, presenting an opportunity to study everyday contests outside the lab.

I am currently pursuing this research as a potential thesis project.

In "Regional expositions and the diffusion of tractors in the early 20th century", I study the effect of product demonstrations on the diffusion of gasoline tractors in the U.S. in the 1910s, using archived sales logs to track sales around the dates and locations of major exhibitions. Contemporary journalism and history books indicate that tractor demonstrations gathered upwards of tens of thousands of farmers and reporters from around a region in one place. These events were prime opportunities for manufacturers to educate potential customers en masse about a new, expensive, and very foreign technology.

If consumer learning is prerequisite to technology adoption, these events should generate significant sales growth. To evaluate the hypothesis, I study Holt tractor sales in California in the quarter before and after each state fair from 1910-1912 – site of the largest, and most prominent, public demonstration of tractors in the region. I find significant sales growth after the state fair in counties near the fair and far from Holt's factory in Stockton. The results suggest that new information obtained by farmers and fleet owners at the state fair may have been important to the purchasing decision. To strengthen the results, I am currently working on expanding the dataset to more manufacturers, geographies, and years, and to include data on firms' marketing activities around the time and place of each demonstration.

My goal for this project is to establish the importance of information from product demonstrations to the diffusion of a new technology, especially one as transformative as the farm tractor. Information about new products may be as important, if not more important, to the diffusion process than cost. This project adds to the literature on innovation, both in agriculture and more generally, by quantifying the role of information in technology adoption. To my knowledge, it is also the first to study the diffusion of tractors using data from original manufacturer records.

My third project is still in an exploratory stage, so it is currently more of a proposal than a work in progress. Using complete data on retail liquor sales in Ontario at the product-store level, I plan to study the response of demand to store entry. Doing so in the unique setting of a beverage control state, where essentially all supply-side variables (e.g., price, product availability) do not vary in the short run, will allow me to "discover" latent demand that is constrained by travel costs. To do so, I am thinking about combining a BLP-style demand estimation with an event study around store openings. The results may shed light on how location differentiates otherwise homogeneous retailers.

[2] Three years later, he is still using both.