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**DESIRED RESEARCH AND TEACHING FIELDS:**

**PRIMARY**

Economics of Innovation  
Industrial Organization  
Economic/Business History

**SECONDARY**

Contracts and Organizations  
Applied Econometrics

**FIELDS OF CONCENTRATION:**

Industrial Organization, Economic History

**DISSERTATION TITLE:** "Essays in Innovation, Past and Present: From the Creative Act to Technology Diffusion"

Expected Date of Completion:	May 2015 (enrolled 2010)
Principal Advisor:	Ben Handel
Other References:	Barry Eichengreen, John Morgan, Steve Tadelis

**PRE-DOCTORAL STUDIES:**

Tufts University

**DEGREE**

B.A., *summa cum laude*, Phi Beta Kappa

**DATE**

2008

**FIELD**

Mathematics, Economics

**PROFESSIONAL EXPERIENCE:**

Associate Consultant, Kaiser Associates, Washington DC (2008-2009)

**TEACHING:**

Graduate Student Instructor, Department of Economics, UC Berkeley  
Economic Statistics and Econometrics (Glenn Woroch)  
Median (mean) overall ratings in Spring 2014: 7.0 (6.45) of 7.0

Fall 2012, Spring 2014

**JOB MARKET PAPER:**

**"Creativity Under Fire: The Effects of Competition on Innovation and the Creative Process"**

Creativity is fundamental to innovation and pervasive in everyday life, yet the creative process has received only limited attention in economics and can in practice be difficult to model and measure. In this paper, I study the effect of competition on individuals' incentives for creative experimentation in the production of commercial art. Using a sample of logo design contests, and a novel, content-based measure of designs' originality, I find that competition has an inverted-U shaped effect on individuals' propensity for innovation: some competition is necessary to induce players to experiment with novel, untested ideas, but heavy competition can drive them to abandon the tournament altogether, such that experimentation is maximized by the presence of one high-quality competitor. The evidence is consistent with a generalized model of agents' choice between risky, radical innovation; more reliable, incremental innovation; and exit from a creative tournament where agents are risk-averse or face decreasing returns to improvement due to a concave success function. These results reconcile conflicting evidence from an extensive literature on the effects of competition on innovation and have direct implications for R&D policy, competition policy, and the management of organizations in creative or research industries.

**OTHER WORKING PAPERS:**

**"Scale versus Scope in the Diffusion of New Technology: Evidence from the Farm Tractor"**

A large literature dating back to Griliches (1957) seeks to explain delays in technology diffusion. This literature offers many explanations for lags in the scale of diffusion for a given application yet has largely avoided the issue of scope -- the set of industries and activities in which a technology is used at all. In this paper, I show that the diffusion of the farm tractor in U.S. agriculture was historically determined by the breadth of its capabilities. Though tractors are now used in nearly every agricultural field operation and in the production of nearly all crops, they first developed for far more limited applications of tillage and harvesting grain, and only in the 1920s did the technology

begin to generalize for broader use. Early diffusion was accordingly quite limited until the technology generalized. The evidence is consistent with a model of innovation that distinguishes between R&D in specific- versus general-purpose features and predicts that diffusion will follow an S-shaped pattern both within and across applications. Similar patterns are seen for steam and electric power in manufacturing and even hybrid corn, the subject of Griliches' seminal study. The results suggest that the key to understanding technology diffusion is not only in explaining the number of different users, but also in explaining the number of different *uses*.

#### **“Interim Feedback in Creative Competition: Trading Off Participation for Quality”**

In this paper, I study the effects of interim feedback in creative competition. Economic theory suggests that feedback operates through two channels: a selection effect, which drives players with poor reviews or facing fierce competition to quit, and a direction effect, which guides continuing players towards better designs. In providing feedback, a principal thus faces a trade-off between encouraging participation and providing direction. Using a sample of four thousand commercial logo design contests, I show that feedback both increases the quality of new designs and reduces participation. To decompose selection and direction, I develop a procedure to estimate players' cost of effort and use the estimates to simulate counterfactuals with alternative feedback policies. I find that while feedback reduces the quantity of innovation, it on net increases the amount of high-quality innovation, with these gains entirely attributable to direction. Interim evaluation can therefore be desirable in settings where productivity improves with guidance.

#### **SHORTER RESEARCH NOTES:**

##### **“How Well Does Distance Proxy for Freight Costs? Evidence from U.S. Railroads in 1914”**

*(note: This document is a byproduct of my research on tractor diffusion)*

Researchers often invoke distance as a proxy for freight costs when direct measures are unavailable, but evidence on the historical strength and nature of this relationship is generally absent. In this note, I provide evidence on the historical relationship between railroad freight rates and route distance. Using data on point-to-point railroad freight rates from a newly discovered historical compendium, I show that freight rates are approximately linear in distance but that the relationship between rates and distance is significantly different for short- and long-haul routes, with short-haul freight rates being relatively flat in distance up to a few hundred miles. I provide a point estimate on long-haul rates per ton-mile for Class 1 L.C.L. merchandise and discuss implications for research interpreting variation in distance as variation in prices.

#### **WORK IN PROGRESS:**

##### **“Creativity in the Presence of Constraints: Evidence from a Controlled Experiment”**

*status: Experimental activity developed; currently in early stages of planning*

##### **“Trust or Bust? Evaluating the Competitive Effects of the Interstate Commerce Act”**

*status: Archival documents in possession; digitization underway*

##### **“Railroad Gauge Standards and Interregional Trade in the 19th Century U.S.”**

*status: Archival documents in possession; digitization underway*

##### **“Creative Influence and the Diffusion of Content in Classical Music Composition”**

in collaboration with Vladimir Viro, LMU-Munich Dept. of Computer Science

*status: Content-based data prepared; currently collecting data on composer relationships*

#### **FELLOWSHIPS AND AWARDS:**

2014	UC Berkeley Conference Travel Grant; Summer Grant (declined)
2014	UC Berkeley Dissertation Completion Fellowship (declined)
2014	EHA Graduate Research Fellowship (\$10,000, used for research)
2013	All-UC Economic History Group Research Grant (\$2,500)
2013	Berkeley Economic History Lab Research Grant (\$1,000)
2012	Berkeley Economic History Lab Research Grant (\$1,000)
2012	NBER Entrepreneurship Research Boot Camp participant
2011-2015	NSF Graduate Research Fellowship (3 years of support)
2010-2014	University of California Regent's Intern Fellowship (2 years of support)
2004	Robert C. Byrd Scholar (U.S. Department of Education)
2004	National Merit Scholar (top <1% of students in state of Texas)

#### **PRESENTATIONS (Non-UC Berkeley):**

2014	NBER Summer Institute (DAE poster session), All-UC Hundred Flowers Conference
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**OTHER INFORMATION:**

Affiliations: American Economic Association  
Economic History Association  
Languages: English (native), Spanish (fluent)  
Citizenship: United States

**ASSORTED INTERESTS:**

Classical piano; Colombia (South America); outdoor sports

**REFERENCES:**

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