Kate Reinmuth
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579 Serra Mall, Stanford, CA 94305
reinmuth@stanford.edu | 360-951-4242

December 30, 2021

NBER | Main Office
1050 Massachusetts Avenue
Cambridge, MA 02138-5398

RE: Innovation Research Boot Camp

Dear Kevin, Ben, and Heidi,

Thank you for considering my application for the NBER innovation research bootcamp. I am currently a second year PhD student in the Department of Economics at Stanford University, where I am in the process of completing the public and industrial organization field sequences. My application enclosed in this PDF will be accompanied by a letter of recommendation from Heidi Williams.

Although I have been interested in IO-adjacent applied microeconomics since early in my undergraduate career, my specific interest in innovation research took off when I took growth with Pete Klenow in the winter quarter of my first year and, especially, when I began working with Heidi during my second year research assistantship. As discussed in additional detail in my two-page essay, I am currently working on an innovation-related project about the Bayh Dole Act and its effect on the "academia-industry lag" and hope to pursue future projects related to innovation in the coming years. I look forward to developing these projects and others further as I continue to progress through Stanford's PhD program.

A variety of previous professional and academic experiences motivated me to pursue a PhD in economics and the fields of public and IO in particular. Before Stanford, I studied economics and political science at Middlebury College. I spent the summers working with organizations focused on using economic research to inform public policy, including the White House Council of Economic Advisers, the Brookings Institution, and the Vermont Legislative Joint Fiscal Office. I also worked as a Jones Fellow in economics at Middlebury, researching topics like the relationship between intergenerational mobility and political support for outsider candidates. After graduating *summa cum laude* with highest honors from Middlebury, I joined NERA's antitrust and competition policy group, where I had the opportunity to lead workstreams related to IO topics.

I am excited by the opportunity to spend several days learning about cutting-edge economics research and techniques in the field of innovation economics. As discussed in additional detail in the accompanying essay, innovation economics stands out to me as an interesting research area because its impacts are incredibly far-reaching – e.g., its implications for long-run economic growth. This research bootcamp provides an ideal opportunity for me to think more in depth about and discuss these vital topics relatively early in my research career such that I would be able to integrate them into my own work throughout the coming years.

Sincerely,

Kate Reinmuth

KATE REINMUTH

Stanford, CA · 360-951-4242 · reinmuth@stanford.edu

EDUCATION

Stanford University – Ph.D. in Economics 2020 – present

- Awards: 2020 NSF GRFP Honorable Mention

Middlebury College – B.A. in Economics and Political Science (*Summa Cum Laude*) 2013 – 2017

- Awards: Phi Beta Kappa (early election for top 2% of graduating class), Johnson Prize in Economics, Dirks Award Nominee in Economics, Kvasnak Award in Political Science, College Scholar all semesters
- Thesis (Highest Honors): "Does the Party Actually Decide? Assessing Voter and Party Power Dynamics in Presidential Nominating Contests from 1980 to 2016"
- Varsity Women's Soccer (CoSIDA Academic All-District; NESCAC All-Academic)

PROFESSIONAL EXPERIENCE

Stanford University (Department of Economics) – Research Assistant 2021 – present

Research questions related to innovation economics with Professor Heidi Williams, including topics such as the lag between academic research and industry application, optimal patent policies, and the effects of moving a drug from prescription to OTC status; support broader research agenda; and write research papers.

NERA Economic Consulting (Antitrust and Competition Policy) – Analyst 2017 – 2020

Programmed in SAS, Stata, and Python to apply microeconomic analysis across a wide array of industries and estimate the competitive effects of mergers/acquisitions; managed projects and researcher teams; drafted memos, white papers, and presentations; and participated in meetings with clients.

Middlebury College (Department of Economics) – Jones Fellow/Research Assistant 2017

Researched behavioral and experimental topics in economics through quantitative and qualitative analysis; created and managed large datasets; drafted literature reviews; and helped write research papers.

Middlebury College (Department of Political Science) – Research Assistant 2015 – 2017

Studied congressional and presidential elections; utilized both existing literature and statistical analysis to assess public policy; drafted reports; and co-authored, presented, and helped publish research papers.

White House Council of Economic Advisers – Research Intern 2016

Conducted qualitative and quantitative research on the macroeconomic and finance portfolios; drafted memos and literature reviews; analyzed data; and fact-checked Council reports and briefs.

The Brookings Institution – Research Intern 2015

Researched domestic policy issues such as the debt ceiling; and wrote literature reviews and blog posts.

PUBLICATIONS

Dickinson, M. and Reinmuth, K. (forthcoming). "Turnover, Loyalty and Competence in the West Wing: The Trump White House in Historical Context." *Presidential Studies Quarterly*.

Dickinson, M. and Reinmuth, K. (2021). "Change and Continuity in White House Staffing: The Trump Factor." *The Forum*, 19(1), 27–46.

Reinmuth, K. and Sommers, P. (2018). "Does Bill James's Pythagorean Formula Apply to England's Premier League?" *Journal of Student Research*, 7(2), 25-28.

Dickinson, M. and Reinmuth, K. (2017). "Trump, Congress, and Health Care: All Politics Is National." *The Forum*, 15(3), 431–450.

CONFERENCE PRESENTATIONS: SPSA Annual Meeting 2017; APSA Annual Meeting 2021

SKILLS

Language: English (native), Spanish (intermediate)
Programming: SAS, SQL, Stata, Python, MATLAB, R, ArcGIS, LATEX, VBA, Amazon Mechanical Turk

Leland Stanford Jr. University
Stanford, CA 94305
USA

Graduate Unofficial Transcript - Detailed

Name : Reinmuth,Kate
Student ID : 06424855

Print Date: 12/01/2021

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* Worksheet - For office use by authorized Stanford personnel *
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--------- Academic Program ---------

Program : Economics
09/14/2020 : Economics (PhD)
Active in Program

--------- Beginning of Academic Record ---------

2020-2021 Autumn

Course		Cmpt	Title	Attempted	Earned	Grade
ECON	202	LEC	MICROECONOMICS I B. Bernheim; Paul Milgrom	4.00	4.00	A-
ECON	210	LEC	MACROECONOMICS I Martin Schneider; Monika Piazzesi	3.00	3.00	A
ECON	270	LEC	INTERMEDIATE ECONOMETRICS I Jann Spiess; Joseph Romano	3.00	3.00	A

GR Term GPA 3.880 Term Totals 10.00 10.00
GR Cum GPA 3.880 Cum Totals 10.00 10.00

2020-2021 Winter

Course		Cmpt	Title	Attempted	Earned	Grade
ECON	203	LEC	MICROECONOMICS II Paul Milgrom	4.00	4.00	B+
ECON	211	LEC	MACROECONOMICS II Monika Piazzesi; Pete Klenow	3.00	3.00	B+
ECON	271	LEC	INTERMEDIATE ECONOMETRICS II Guido Imbens	3.00	3.00	A+

GR Term GPA 3.600 Term Totals 10.00 10.00
GR Cum GPA 3.740 Cum Totals 20.00 20.00

2020-2021 Spring

Course		Cmpt	Title	Attempted	Earned	Grade
ECON	204	LEC	MICROECONOMICS III Matthew Jackson	4.00	4.00	A
ECON	212	LEC	MACROECONOMICS III Adrien Auclert; Patrick Kehoe	3.00	3.00	A+
ECON	272	LEC	INTERMEDIATE ECONOMETRICS III Han Hong; Luigi Bocola	3.00	3.00	A

GR Term GPA 4.090 Term Totals 10.00 10.00
GR Cum GPA 3.856 Cum Totals 30.00 30.00

2020-2021 Summer

Course		Cmpt	Title	Attempted	Earned	Grade
ECON	239D	INS	DIRECTED READING Heidi Williams	1.00	1.00	CR

GR Term GPA 0.000 Term Totals 1.00 1.00
GR Cum GPA 3.856 Cum Totals 31.00 31.00

2021-2022 Autumn

Course		Cmpt	Title	Attempted	Earned	Grade
ECON	241	LEC	PUBLIC ECONOMICS I Caroline Hoxby	4.00	0.00	
ECON	257	LEC	INDUSTRIAL ORGANIZATION 1 Brad Larsen; Jose Ignacio Cuesta Paulo Somaini	3.00	0.00	
ECON	278	LEC	BEHAVIORAL AND EXPERIMENTAL ECONOMICS I Alvin Roth; B. Bernheim	3.00	0.00	

GR Term GPA 0.000 Term Totals 10.00 0.00
GR Cum GPA 3.856 Cum Totals 41.00 31.00

Graduate Career Totals
Cum GPA 3.856 Cum Totals 41.00 31.00

--------- Non-Course Milestones ---------

Candidacy Qualifying Process -
Plan: ECON-PHD

Candidacy Form - Doctoral Candidacy Form
Plan: ECON-PHD

Dissertn Read Committee Approv -
Plan: ECON-PHD

University Oral Exam (doct) -
Plan: ECON-PHD

Doctoral Dissertation -
Plan: ECON-PHD

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* Worksheet - For office use by authorized Stanford personnel *
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Information must be kept confidential and must not be disclosed to other parties without the written consent of the student.

Leland Stanford Jr. University
Stanford, CA 94305
USA

Graduate Unofficial Transcript - Detailed

Name : Reinmuth,Kate
Student ID : 06424855

END OF TRANSCRIPT

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Innovation Research Boot Camp Application | Two Page Essay | December 30, 2021

Kate Reinmuth

As previewed in my cover letter, my interest in applied microeconomics began early in my undergraduate career. I have spent the years since expanding and refining my understanding of the concepts and tools employed in the field through both academic and professional experiences. Now, at Stanford University, I am fortunate to have the opportunity to delve even more deeply into specific research areas of interest. For example, in addition to my industrial organization, public, labor, and behavior field courses, I have been able to focus on questions related to innovation economics through a research assistantship with Heidi Williams as well as through independent research projects. I discuss a few projects that currently excite me below.

First and foremost, I am actively working on a project related to how and when academic knowledge and inventions are applied in industry. In theory, innovation accomplished in university settings could be put to use outside of academia in order to benefit society most broadly. Policymakers had this idea in mind when they enacted the Bayh Dole Act in 1980 and allowed universities to retain property rights to inventions deriving from federally funded research. Bearing in mind its stated intention to increase the pace and frequency with which technology is transferred from academia to industry, I intend to approximate and then analyze the "academia-industry lag" before and after the Bayh Dole policy change using robust data on citations of academic research in patent applications and on federal funding for that academic research. In theory, if Bayh Dole decreased the lag, then the rate of citation should increase following 1980 for federally funded research (relative to the rate of citation for research that did not receive federal funding and would therefore not have been impacted by Bayh Dole). Existing patent-related research about the effect of Bayh Dole suggests that the rate of patents granted to universities increased significantly in the period following the Bayh-Dole Act's enactment.[1] This project would consider more specifically the role of academic research in *industry* patents rather than university patents, given that there are multiple channels through which academic knowledge may be applied in industry. Previous research also suggests that the lag between publication of scholarly research and its application in industry averages 7-20 years.[2] Therefore, this research question could not actually have been reliably assessed until recently, when both enough papers and enough

[1] See Henderson, Jaffe, and Trajtenberg 1998.

[2] See Jensen and Thursby (2001).

time would have passed following the enactment of Bayh Dole. Without going into unnecessary detail about data and empirical strategy, suffice it to say that I plan to test the effect of Bayh Dole by considering a hazard model to predict the probability that each paper published in a given year and a given field is cited in a patent application by year x following that paper's publication. Depending on the initial results, multiple follow-up questions come immediately to mind, including whether the effects of Bayh Dole differ by funding agency, whether the *intensity* of citations to a given paper should also be considered as a measure of its industrial application, whether conferences serve as an informal channel for information flows to industry, and whether there are interesting geographical impacts attributable to Bayh Dole.[3]

I note that my research interests also extend beyond innovation economics. In the field of behavioral public economics, for example, I previously worked on a theoretical model to incorporate behavioral considerations like heterogeneous weight consciousness and satiation awareness into the analysis of taxes on high-fat and high-sugar foods and beverages. I am interested in research at the intersection of these fields because behavioral public economics can help us design policies to account for departures from the "standard" economic model of decision-making and more effectively accomplish policy goals – e.g., designing optimal taxes to combat obesity, which not only generates disutility for the individual but also generate negative externalities like inflated healthcare costs and diminished productivity. More recently, in addition to the Bayh Dole project discussed above, I am working on an altruism project that relates to the existing literature on identified victim and group effects and aspires to test whether previous exposure to individuals experiencing hardship affects transfer choices in a dictator game (e.g., due to attention aversion). On the public finance side, I am working on a project to estimate the externalities associated with shortest-route algorithm mobile applications. I have also been working on public-adjacent projects related to staff hiring patterns across presidential administration. I look forward to developing these projects and others further as I continue to progress through Stanford's PhD program.

In summary, my research interests converge to a few different spaces around the applied microeconomics and public finance fields. Innovation economics stands out to me as a critical and interesting space because its impacts are incredibly far-reaching. I note in particular its implications for long-run economic growth. As a result, conducting research on how we learn and innovate as a society is crucial, and I hope that I am able to do so not only in my work at Stanford but as a part of this year's NBER Innovation Research Boot Camp.

[3] On this last point, see Bloom, Hassan, Kalyani, Lerner, and Tahoun (2020); Hausman (2020); and Watzinger, Treber, and Schnitzer (2018).

Cover letter

I am writing letters for several PhD students and recent PhDs for the Innovation Research Boot Camp. So far, 2022 has been a bit of a disaster as our kids' school delayed their opening and has then been remote due to COVID. Given my reduced work hours, I hope that you will forgive me for sending letters when available that I have written for other purposes, or short letters when I have not previously written a letter for the student previously. This in no way reflects on the students, but rather just reflects the disaster of my 2022 schedule. Thank you for your understanding.

Heidi Williams (hlwill@stanford.edu)

Stanford University

HEIDI WILLIAMS
Charles R. Schwab Professor of Economics

Dear Sir or Madam,

I am delighted to be writing with my very strong recommendation of **Kate Reinmuth** for the Knight-Hennessy Scholars program.

Let me start by explaining how I know Kate. I co-chair PhD admissions in the economics department at Stanford, and read each of the ~800 applications we receive annually. We have an embarrassment of riches in terms of qualified applicants, but every year around 20 stand out as obviously exceptional in terms of their potential. Within that 20, maybe 5 are people I would think of as plausible candidates for Knight-Hennessy, which is consistent with us having between 1-3 Knight Hennessy Scholars each year the past several years. In her cohort, based on information I read in her PhD application at the time she applied to our program, I would have clearly put Kate in that group of 5. In my interactions with her since then, she has only outperformed my very high expectations. I hope this context makes clear that I think Kate should be a very strong candidate for Knight-Hennessy.

Narrowly defined as a student, Kate's undergrad record was excellent: she was a joint economics-political science major at Middlebury College with an essentially perfect undergraduate record (3.94 GPA), and she applied to Stanford with perfect verbal and quant GRE scores. However, this record is much more impressive in the broader context of her

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application. Kate was a varsity women's soccer player. One of her recommendation letters was from one of the most curmudgeonly and negative economists I have ever met, and yet his letter couldn't have been more glowing. Her NERA recommender put her in the top 5 analysts he has worked with out of over 500 over the last 30 years. Against that background, I was completely unsurprised when I learned Kate had gotten admitted to every economics PhD program she applied to. I was nothing short of thrilled when I learned that Stanford had beat out our competition – recruiting Kate away from MIT (arguably the "top" program) to instead join us at Stanford.

Most striking to me when I read her application was Kate's incredibly clear and persistent commitment to public service. It is not uncommon for undergraduate economic majors to intern for the President's Council of Economic Advisers – as Kate did – nor to intern at a public policy think tank like Brookings or AEI – again, as Kate did; doing all three is somewhat unusual. It is even more unusual to see students who had been on-track for a public service "dream job" post-undergraduate graduation (in her case, at the CIA), and quite unusual to see students who have as clear of a sense as Kate does that she is coming to get her PhD in order to rotate back into public service. The Knight Hennessy program would be a perfect support to Kate in this endeavor: she wants to learn economics in order to go out and make a real difference working in government, and she will be most successful at doing so if she has a broad set of colleagues and peers. As one analogy: I was lucky to be selected as a Harry S.

Truman Scholar, and more than any other peer group the Truman community has felt like a real source of support for me as I have tried to navigate a career in public service.

Fast forward: I do not teach in Stanford's first year PhD sequence, so my first substantial one-on-one interaction with Kate arrived during the spring of her first year when I met with her as part of our process of matching first year PhD students with PhD advisers. I remember that the e-mail went out to "open" meetings for the match process, and within about 2 minutes I had a very thoughtful e-mail from Kate saying she would love to work with me. You can imagine that I was thrilled to hear that! She and I had a very thoughtful back-and-forth exchange about her current research interests as well as what she was looking for in a mentor/adviser. Even just in that relatively short exchange, she came across as one of the most thoughtful, mature, humble, and articulate students I have had the opportunity to interact with.

Through that program, Kate started working with me in summer 2021 as a part-time research assistant as well as an advisee. It is sometimes difficult to summarize a reaction to the quality of a student's work over a relatively short time period (here, a few months) especially when in-person interactions are limited due to COVID. Thankfully, in Kate's case this is very easy to do. The first thing I asked her to do was to read and send comments on a ~80 page book chapter I had just finished a draft of. I sent the draft to say 10 of my current students for comments, and at the same time I gave the draft a fresh read-through myself. Most of my

students sent back somewhat nit-picky or off base comments. Kate's notes, in contrast, were nearly identical to my own – on everything from catching gaps in the logic of my argument to seeing opportunities to reference analogs in other literatures. I was, to be frank, pretty astounded to get that quality of comments from a first year graduate student.

The next project I gave Kate was more open-ended. I am starting a new research project looking at how academic discoveries get commercialized by private firms. I have one very early stage project in that area which I didn't mention to Kate – rather, I just pointed her to a few things to read, and suggested she come back to me to talk about them. You can again imagine that I was pretty astounded when Kate came back to me with a proposal for essentially the same project I was already doing. Her intuition for policy relevance of questions and empirical methodologies for tackling them are both really exceptional. I hope that this example makes clear that I think Kate demonstrates real intellectual curiosity and a strong ability to tackle challenging questions.

I have also been really impressed with Kate at a personal level. She exhibits a real gift for speaking on behalf of others in a way that provides quiet leadership in needed situations. She is incredibly proactive in supporting our students from diverse backgrounds not just directly, but also on their behalf when points of awkwardness arise with other students or faculty. A somewhat sticky situation arose last year, and Kate was the one who spoke up –

coming to me to explain how she had thought about the potential costs and benefits of different paths forward, and working with me to navigate a solution.

There is a “box” I have rarely encountered in my career of young women who are brilliant academically, humble but ambitious, committed to a career in public service, exceptional on inter-personal skills, and incredibly kind. All of those women have gone on to great things. Let me urge you not to miss the chance to support Kate on her path to making an impact.

Sincerely,



Heidi L. Williams