

Nicola Bianchi  
Department of Economics, Stanford University  
579 Serra Mall, Stanford, CA 94305-6072  
Phone: (650) 862-4880 | [nbianchi@stanford.edu](mailto:nbianchi@stanford.edu)  
<http://www.stanford.edu/~nbianchi>

Productivity, Innovation and Entrepreneurship Program  
National Bureau of Economic Research

November 19, 2014

Dear Recruiting Committee,

I would like to apply for a postdoctoral position in the Productivity, Innovation and Entrepreneurship (PIE) Program, as advertised in the JOE listing. I am currently completing a Ph.D. in economics at Stanford University. My primary fields of study are the economics of education and innovation.

In innovation, my current work examines the effect of compulsory licensing on invention. In a paper with Petra Moser and Joerg Baten (“Patents, Competition, and Innovation – Evidence from Compulsory Licensing during WWI”), we exploit the 1918 US decision to violate enemy-owned patents to investigate the effects of this policy on German invention. We find evidence that after 1918 German inventors produced more innovation in chemical fields with licensing. Overall, our results indicate that compulsory licensing can promote innovation by encouraging competition.

Going forward, I intend to work on two projects. In one project, I will study how public policies that promote STEM (science, technology, engineering, and math) education might affect the production of innovation. In another project, I will study whether learning to innovate can be transferred across firms and countries.

**Project 1: “The Promotion of STEM Education and Its Effect on Innovation (with Michela Giorcelli)”**

Scientific knowledge can benefit the economy at large, because it is an important driver of technological innovation. Technological innovation, in turn, can foster economic growth and guarantee long-term prosperity. From this perspective, the promotion of STEM education is one way in which countries can achieve (or maintain) preeminence in science and technology.

To foster innovation, many recent policies have been designed to increase enrollment into university STEM (science, technology, engineering, and math) fields. The effects of these policies, however, are ex-ante ambiguous. For example, the students induced to enroll in STEM majors might have low ability and not produce any innovation. Moreover, the entry of low-ability students might convince the best STEM talents to move elsewhere, resulting in a net decrease of innovation.

In this project, we examine a 1961 Italian reform that allowed a well-identified group of high school graduates to enroll for the first time in university STEM programs. As a consequence, freshman enrollment in these fields increased by more than 200 percent in a few years. The students allowed to enroll in STEM majors were studying STEM-related disciplines in high school but were previously denied access to university. The reform, then, replaced high school-educated with college-educated STEM workers.

The data that we use in this project come from two main sources. Initially, I collected data from hand-written transcripts on more than 27,000 students from a major Italian city. With this data, we are able to identify the students that enrolled into STEM majors after the policy change. We are also able to look at the college career of students that were not directly affected and might have decided to enroll into different fields after 1961, due to the large influx of students into STEM majors.

We will link this schooling data to information on each patent issued by the Italian Patent Office from 1958 to 2013. We photographed the patent registries in Italy and we are now in the process of digitizing them. When this procedure is completed, we will measure how the patenting activity of STEM graduates changed after the policy implementation.

With this project, we will be able to answer two sets of questions. First, we will examine how a policy that promotes university STEM education affects the production of innovation. Second, we will be able to link detailed academic outcomes to patenting activity. This will allow us to study how human capital acquired in college shapes invention.

### **Project 2: The Transmission of Innovation Across Countries and Firms (with Michela Giorcelli)**

In this project, we exploit a historical international policy to examine whether learning to innovate can be transferred across firms and countries. Starting in 1952, the US government promoted the transmission of technical information from US firms at the technological forefront to European firms recovering from World War II. In practice, this program organized consulting sessions of US experts in Europe and study trips of European technicians and engineers to the US. We intend to examine the effects of this policy on the degree of innovation of Italian firms.

We use two main sources of data. We already collected and digitized detailed information on 6,035 Italian firms located in 32 provinces spanning from 1930 to 1970. All these firms would have been ex-ante eligible for the program (they had fewer than 500 employees and compiled a balance sheet). Due to restricted funding, however, only firms located in 5 provinces (902 firms) were deemed eligible. In Italy, we copied and digitized the balance sheets of all the 6,035 firms to get information about their size, productivity, and governance structure. We also collected information on the firms that applied to the program from the archive of the national agency in charge of implementing the policy.

We will soon link this data to information on each patent issued by the Italian Patent Office from 1940 to 2013. Once the digitization of the patent data is completed, we will be able to measure how participating into the program (therefore, receiving technical training from US firms) affected patenting activity of Italian firms. More specifically, we will compare how patenting changed after 1952 among participating (or eligible) firms, relative to similar firms in ineligible provinces.

In support of my application, I have enclosed my curriculum vitae. Please, let me know if I may provide any other information. I plan to attend the ASSA meeting, and would be pleased to meet with you there or elsewhere at your convenience. Thank you for considering my application.

Sincerely,



Nicola Bianchi

## NICOLA BIANCHI

[nbianchi@stanford.edu](mailto:nbianchi@stanford.edu)

<http://www.stanford.edu/~nbianchi>

Department of Economics  
Stanford University  
579 Serra Mall  
Stanford, CA 94305-6072  
(650) 862-4880

### EDUCATION

Ph.D. in Economics, Stanford University, 2009-  
Expected Completion: June 2015

M.Sc. in Economics, Università Bocconi, 2006-2008 (Summa cum Laude)  
B.A. in Business, Università Bocconi, 2003-2006 (Summa cum Laude).

### DISSERTATION COMMITTEE

Prof. Caroline M. Hoxby (**primary**)  
Economics Department  
Stanford University  
(650) 725-8719  
[choxby@stanford.edu](mailto:choxby@stanford.edu)

Prof. Ran Abramitzky  
Economics Department  
Stanford University  
(650) 723-9276  
[ranabr@stanford.edu](mailto:ranabr@stanford.edu)

Prof. Petra Moser  
Economics Department  
Stanford University  
(650) 723-9303  
[pmoser@stanford.edu](mailto:pmoser@stanford.edu)

Prof. Luigi Pistaferri  
Economics Department  
Stanford University  
(650) 724-4904  
[pista@stanford.edu](mailto:pista@stanford.edu)

### RESEARCH AND TEACHING FIELDS

Primary Fields: Public Economics, Economics of Education, Labor Economics  
Secondary Fields: Economic History

### TEACHING EXPERIENCE

- 2013-14 Teaching Assistant for Prof. P. Dupas, Stanford University, Econ 118 (Development Economics)
- 2012-13 Teaching Assistant for Prof. P. Dupas, Stanford University, Econ 118 (Development Economics)
- 2011-12 Teaching Assistant for Prof. C. Landais, Stanford University, Econ 101 (Economic Policy Analysis).

## **RELEVANT POSITIONS**

- 2010-12 Research Assistant for Prof. P. Moser, Stanford University.  
2008-09 Research Assistant for Prof. V. Galasso, Università Bocconi.  
2007-08 Research Assistant for Prof. P. Muliere, Università Bocconi.

## **SCHOLARSHIPS, HONORS AND AWARDS**

- 2014-15 Graduate Student Grant, The Europe Center at Stanford University (\$5,000)  
2014-15 Haley-Shaw Scholarship, Stanford Institute for Economic Policy Research  
2013-14 Outstanding Teaching Assistant Award, Department of Economics,  
Stanford University (Econ 118)  
2013-14 George P. Shultz Grant, Stanford Institute for Economic Policy Research  
(\$15,000)  
2012-13 George P. Shultz Scholarship, Stanford Institute for Economic  
Policy Research  
2012-13 Graduate Research Opportunity (GRO) Award, School of Humanities  
and Sciences, Stanford University (\$4,500)  
2009-11 Economics Department Fellowship, Stanford University.  
2006-08 Bocconi Merit Award, Università Bocconi.

## **PROFESSIONAL ACTIVITIES**

Referee: *American Economic Review*.

Seminar presenter: UC Berkeley Economic History Lunch, 2014 All-UC Graduate Workshop in Economic History, UC Davis.

## **RESEARCH PAPERS**

### *The General Equilibrium Effects of Educational Expansion (Job market paper)*

In an effort to raise skills or promote equality, states sometimes engage in sweeping reforms that rapidly increase access to education for a significant share of their population. Such reforms are hard to evaluate because they may alter more than the outcomes of marginal students induced to enroll. They may change returns to skill, school quality, peer effects, and the educational choices of apparently inframarginal students (those who would have enrolled in the absence of the reform). I identify such general equilibrium effects by examining a dramatic 1961 Italian reform that increased university enrollment in science, technology, engineering, and math (STEM) fields by more than 200 percent in a few years. The peculiar features of the reform allow me to identify students who were unaffected, directly affected, and indirectly affected. They also allow me to identify key channels through which the effects ran. Using data I collected from tax returns and hand-written transcripts on more than 27,000 students, I show that the direct effects of the reform were as intended: many more students enrolled and many more obtained degrees. However, I also find that those induced to enroll earned no more than students in earlier cohorts who were denied access to university. I reconcile these surprising results by showing that the education expansion reduced returns to skill and lowered university learning through congestion and peer effects. I also demonstrate that apparently inframarginal students were significantly affected: the

most able of them abandoned STEM majors rather than accept lower returns and lower human capital.

*Patents, Competition, and Innovation – Evidence from Compulsory Licensing during WWI* (joint with Joerg Baten and Petra Moser)

Compulsory licensing allows governments to license a patented technology without the consent of the patent owner. In recent years, many developing countries have used compulsory licensing to access patented drugs to fight public health emergencies. However, compulsory licensing is a clear violation of intellectual property and might decrease the incentives to innovate by increasing the risk of expropriation. In this paper, we exploit the 1918 US decision to violate enemy-owned patents to investigate the effects of this policy on German invention. We collected and digitized almost 80,000 German patents in chemical fields with application dates from 1900 to 1930. We find evidence that after 1918 German inventors produced more innovation in chemical fields with licensing. Controls for patent quality suggest that only a small share of this increase was due to lower quality, strategic patents. Firm-level analyses of patent data also reveal a significant increase in the number of research-active firms in fields with licensing. In the same fields, firms whose patents had been licensed began to patent more. These results indicate that compulsory licensing can promote innovation by encouraging competitors to enter fields with licensing.

## **RESEARCH IN PROGRESS**

*The Promotion of STEM Education and Its Effect on Innovation* (with Michela Giorcelli)

Many recent policies are designed to increase enrollment into university STEM (science, technology, engineering, and math) fields with the intended goal to foster innovation. The effects of these policies, however, are ex-ante ambiguous. For example, the students induced to enroll in STEM majors might have low ability and not produce any innovation. Moreover, the entry of low-ability students might convince the best STEM talents to move elsewhere, resulting in a net decrease of innovation. In this project, we use a 1961 Italian reform that increased enrollment in university STEM programs by more than 200 percent in only a few years. The students allowed in 1961 to enroll in STEM majors were studying STEM-related disciplines in high school but were previously denied access to university. Therefore, the reform replaced high school-educated STEM workers with college-educated STEM workers. We intend to isolate the effects of the policy on invention using a variety of techniques. At the individual level, we link the school and income data of students that were in school just before and after 1961 with information on each Italian patent that they owned or developed. At the national level, we intend to exploit differential increases of STEM skills by geographical location and by field of study.

*The Intergenerational Effects of Educational Expansion* (with Massimo Anelli and Giovanni Peri)

Acquiring more education can have positive returns that extend to the next generation. If children of more educated parents are more likely to attend college, policies that aim at expanding access to higher education might increase social mobility across generations and raise children's expected income. However, identifying the effect of parents' education on their children's achievements is complicated by a wide array of confounding factors. For instance, education is positively correlated with parental income. Comparing the outcomes of children of more and less educated parents would thus not disentangle the influence of parental education

and parental wealth. In this paper, we exploit a 1961 Italian reform that dramatically expanded college enrollment as a positive shock to the education level of one generation. We link school and income of more than 27,000 Italians that were in school just before and after the policy implementation with information on schooling and income of their children. We are able to isolate the role of parental education on the outcomes of the next generation because the reform increased parents' education with no effects on their income (Bianchi 2014). Preliminary results show that the children of the individuals that acquired more education through the reform were more likely to choose a high-paying field (business and engineering) in university.

*The Transmission of Innovation Across Countries and Firms (with Michela Giorcelli)*

In this project, we exploit a historical international policy to examine whether learning to innovate can be transferred across firms and countries. Starting in 1952, the US government promoted the transmission of technical information from US firms at the technological forefront to European firms recovering from World War II. In practice, this program organized consulting sessions of US experts in Europe and study trips of European technicians to the US. We collected data on 6,035 Italian firms located in 32 provinces spanning from 1930 to 1970. All these firms would have been ex-ante eligible for the program (they had less than 500 employees and compiled a balance sheet). Due to restricted funding, however, only firms located in 5 provinces (902 firms) were deemed eligible. In addition, we collected information on all patents issued by the Italian Patent Office from 1940 to 2013. To examine the effects of this policy on Italian innovation, we will compare how patenting changed after 1952 among participating (or eligible) firms, relative to similar firms in ineligible provinces.