Cristobal Cheyre

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April 2, 2012

NBER Entrepreneurship Research Boot Camp

NBER, Cambridge, Massachusetts.

Dear Sirs,

I am interested in attending to the 5th NBER Entrepreneurship Research Boot Camp. My complete application is attached to this letter, and my advisor's recommendation was e-mailed separately to the addressed provided for this purpose.

I am currently a fourth year student in the PhD program in Technological Change and Entrepreneurship at Carnegie Mellon University. On my dissertation I am studying how incumbents differ from new firms, especially spinoffs, in their initial staffing of inventors, and how this affects mobility rates and knowledge diffusion in clustered regions.

My interest on attending the Boot Camp is to acquire a better knowledge on the forefront of entrepreneurship research, as well as to meet with fellow students and leading researchers of the fields. This would be of great help as I transition from Ph.D. student to scholar and start developing my research interests individually.

Sincerely,

Cristobal Cheyre

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April 2, 2012

Subject: Recommendation for Cristobal Cheyre

Dear Organizers,

I am very pleased to recommend Cristobal Cheyre participate in the NBER Entrepreneurship Research Boot Camp. Cristobal is a very bright and talented student. He has been demonstrating superior performance as a doctoral student and maturing researcher and I am convinced that he offers the promise to become an excellent scholar.

I met Cristobal three and a half years ago, when he started as a doctoral student in the PhD in Technological Change and Entrepreneurship. I also became his main advisor and have been working on research with him since then. Cristobal also has as a co-advisor Steven Klepper, a professor in the department of Social and Decision Sciences. During the curricular part of the PhD, Cristobal had a stellar performance. First, he was an A level student, clearly mastering the knowledge and skill set we expect a PhD student to acquire. He also completed his qualifying exams with a superior result. He has been the only student since we established a PhD program concentration focus in on innovation and entrepreneurship that did so with a clear distinction.

Second, he has been progressing extremely well in his research work and is now preparing a dissertation that I believe will have a significant impact in the entrepreneurship and innovation literature. Cristobal took a dataset we had developed at Carnegie Mellon, which included all the firms in the semiconductor industry, including their origins, and carefully linked all the patents and the individual inventors to the data. This allows him to track, not only which firms patent, but also which inventors patent where and when. Using this broader dataset, his dissertation explores how entrepreneurial firms hire knowledge employees and create value from them. An initial analysis finds that the greater mobility of semiconductor inventors in Silicon Valley was due primarily to spinoffs and new entrants, not the clustering of the industry in the region. This finding, which is included in a first research paper now under review at a major research journal, demonstrates how entrepreneurial firms play a critical role in the mobility of knowledge workers. This interest was later confirmed when Cristobal found that incumbents indeed hire mostly inventors that are new to patenting, rather than from other firms. Existing literature on knowledge sourcing has not identified the significance of this distinction between

Carnegie Mellon

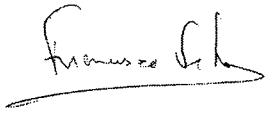
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incumbents and entrepreneurs. As a result, this has not really been the subject of a deep exploration. Yet, this can be extremely important. First, a variety of existing papers on knowledge sourcing through mobility can be extended because the results might be different once incumbents and new firms are identified. Second, exploring who are these mobile knowledge workers that entrepreneurial firms rely so much on and how they shape the knowledge base and performance of a firm can prove to be very fertile ground to better understand the origins and build up of entrepreneurial capabilities. Third, the research can also help uncover the benefits and drawbacks of mobility and intellectual property policies. Finally, it will help explore the relevance and nature of the spillovers that the incumbents, which train these mobile inventors, provide to the entrepreneurial firms that source them. I believe that this topic will prove a research ground that he can explore beyond his PhD and as he starts his career as an entrepreneurship scholar.

Cristobal's progress shows that he is able to acquire the relevant knowledge as well as to apply and build on it towards independent and original research. This is clearly what is desired in a PhD student and an emerging scholar. At a more personal level, he is diligent, committed and a pleasure to collaborate with. I have interacted with him not only as an advisor, but also as an instructor in a course that in which he was the Teaching Assistant and he displayed all the traits of a natural teacher. He was careful and complete in learning the material, diligent and comprehensive in his working with the students as well as assertive and inventive in his contributions to my teaching effort.

His participation in the bootcamp will be extremely valuable, both to enrich his training and understanding of the entrepreneurship phenomena and the frontier research on the topic, but also to extend his network of collaborators, an important asset as he prepares his entry into the academic job market. Based on my assessment of his work and preparation, as well as future plans, it is without any reservation that I strongly recommend Cristobal to participate in the bootcamp. Please do not hesitate to contact me if you have any further questions.

Regards,



Francisco Veloso
(Full Professor)

Curriculum Vitae

Cristobal Cheyre
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Education

August, 2008 - present: Ph.d. Technological Change and Entrepreneurship
Carnegie Mellon University, Pittsburgh, PA.
Catolica-Lisbon Business School and Instituto Superior Tecnico – UTL.
Lisbon, Portugal.
Expected graduation: Spring, 2013.
GPA: 3.88. Approved qualifier exams with honors.

August, 2005: Master on Science of Engineering. Concentration on Engineering Economic Systems
Pontificia Universidad Católica de Chile, Santiago, Chile.
GPA: 6.0 (on a 7 points scale)

August, 2005: Industrial Engineer and Diploma in Electrical Engineering.
Pontificia Universidad Católica de Chile, Santiago, Chile.
GPA: 5.4 (on a 7 points scale). Graduated with maximum distinction.

July, 2002: B.S. Industrial Engineering
Pontificia Universidad Católica de Chile, Santiago, Chile

Scholarships

2011: Chile Scholarship for Doctoral Studies.
2008: Scholarship from the Ministry of Science, Technology and Higher Education of the Portuguese Government.
2008: President of the Republic Scholarship for Doctoral Studies from the government of Chile (Declined).

Relevant Working Experience

Universidad de los Andes. Santiago, Chile.
2005 – 2006: Research Professor
2006 – 2008: Research Professor and Secretary of the School of Engineering.
Lecturer in the courses of Microeconomic Theory and Corporate Finance.
Appointed by the office of the president as member of the executive board for the process of institutional accreditation.

Inter-American Development Bank. Washington D.C.

2004 Winter Intern (January – March 2004). Worked at the research team of the credit risk management department.

Sonda S.A. Santiago, Chile

2003 Intern (June – July 2003). Worked under the supervision of the CFO developing a forecasting model of the financial statements of the company that was later used as supporting documentation for emitting a corporate bond.

Pontificia Universidad Católica de Chile. Santiago, Chile

2001 Teaching Assistant in the courses of Corporate Finance, and Accounting.

Publications

Chapters in Books

Castro, Rodrigo and Cristobal Cheyre, 2006. Midiendo la desigualdad del ingreso y la movilidad de la pobreza en Chile (Measuring the inequality of the income distribution and the dynamics of poverty in Chile) in *La nueva realidad de la pobreza en Chile (The new reality of Poverty in Chile).* Libertad y Desarrollo, Santiago, Chile.

Presentations

Cheyre, Cristobal, Steven Klepper and Francisco Veloso. Spinoffs and the Mobility of US Merchant Semiconductor Inventors. *2011 Darden Entrepreneurship and Innovation Research Conference.* Darden School of Business, University of Virginia, Charlottesville, VA.

Cheyre, Cristobal, Steven Klepper and Francisco Veloso. Job Hopping, spinoffs, and the mobility of U.S. merchant semiconductor inventors. *Frontiers in Entrepreneurship research: Entrepreneurship, Innovation and Human Capital.* Catolica-Lisbon Business School. Lisbon, Portugal. December, 2010.

Cheyre, Cristobal and Nicolas Majluf. Contribution of Firms to Human Capital: Lessons from the Dynamics of Poverty in Chile. Cheyre, C. and Majluf, N. *Second International Conference on Strategic Management in Latin America.* Santiago, Chile. January, 2007.

Working Papers

Cheyre, Cristobal, Steven Klepper and Francisco Veloso, 2011. Spinoffs and the Mobility of U.S. Merchant Semiconductor Inventors. *Manuscript.* Carnegie Mellon University.

List of completed Ph.D. courses.

Organizational theory
Introduction to theory and practice of policy analysis.
Heinz College Ph.D. econometrics sequence (3 econometric courses).
Ph.D. Microeconomics.
Dynamics models and decision making.
Entrepreneurship theory.
Growth, technological progress, and development.
Perspectives on industrial research and development.
Workshop on applied policy analysis.
Ph.D. International Microeconomics.
Economics of technological change.

Essay

I am a fourth year student in the Ph.D. program in Technological Change and Entrepreneurship program at Carnegie Mellon, which is taught in collaboration with two universities in Portugal through the Carnegie Mellon|Portugal initiative. During the program I had been systematically exposed to the main topics on entrepreneurship research, and as I approach my graduation, I would find very attractive a participation in the NBER entrepreneurship research boot camp. As I start to develop projects on my own, I find the opportunity of learning a different perspective on some topics that I have been studying and researching, and to learn about some new subjects on entrepreneurship research of great value. Also, having an instance to meet fellow students interested on the same topics, as well as leading scholars, is a great opportunity for someone that is starting his careers on this field.

My dissertation examines inventor mobility and its effect on knowledge spillovers. While there is strong evidence in the literature that clustered regions are characterized by higher inventor mobility, there is no consensus on why this is the case. My research aims to deepen our understanding of this extra mobility and associated spillovers by exploring the role that entrepreneurial entry, and spinoffs in particular, play in this process. This goes to the center of how entrepreneurial firms value the previous experience of inventors, and how the availability of movable workers with specific backgrounds can foster firm entry in determined regions.

The first part of my dissertation proposes that spinoff-driven entry in clusters can explain enhanced mobility rates there. The main argument behind this proposition is that it's easier and cheaper for spinoffs to cover their initial staffing needs by hiring inventors from their parent and from other local firms, rather than from distant regions. Thus, the greater availability of workers in clusters makes spinoffs more profitable there, increasing firm entry and consequently inventor mobility. These predictions are tested using data on patenters in the semiconductor industry and detailed information on all major entrants in the industry since the start of the industry up to 1987, and their heritage. The findings indicate that a substantial share of the higher mobility rate of inventor in Silicon Valley, where the industry clustered, can be explained by the entry of spinoff there.

The work I developed in the first part of my dissertation revealed striking difference in the hiring choices of recent entrants and incumbents. New firms hire most of their inventors from other firms, while incumbents hire mostly recent graduates. In the second part of my dissertation I study how this patterns relate to a considerable body of literature that establishes hiring as a learning strategy to acquire valuable knowledge from competitors. My hypothesis is that two different type of learning might result from hiring experienced inventors. As it has been pointed out in the literature, the hiring firm can acquire specific pieces of knowledge from the source firm. But, it could also be the case that firms hire inventors not for their expertise on specific knowledge of the source firm, but for the general knowledge of the industry embodied in them. This would explain why new entrants hire so many experienced inventors, while incumbents use the strategy less frequently. To test hypothesis I analyze patent citations between all major semiconductor firms, and relate their citations patterns to inventor mobility events between them. My preliminary findings suggest that entrepreneurial firms learn more specific knowledge from moving inventors than incumbents, especially when the inventor is hired from the parent. In terms of general knowledge, only new firms benefit from this type of learning, and the maximum benefit is achieved when the inventor is hire from a leading firm.

For the rest of the dissertation, I intend to study how as the industry evolves and the technology becomes more complex, the possibility of hiring workers from local firms to acquire general knowledge, and especially from the parent to access specific knowledge gets more important in the entry and location decision of new firms.

As I approach my graduation, expected in the next academic year, I'm thinking on new research projects that might be natural extensions of my current research, as well as others beyond that. I think I could benefit from the boot camp on both accounts. Learning about topics that I have not encountered so far, listening to different perspectives on subjects that I studied, and meeting a community of scholar with common interests would solidify my understanding of the field and allow me to better position my current research effort