Application to attend the NBER Economics of Digitization 2018 meeting at Stanford University

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To whom it may concern:

I am an economist in training with strong interests in digitization and its aggregate implications. I am pursuing the first year of a joint Ph.D. program in Business Economics at the Harvard Economics Department and Harvard Business School. I hold a La Caixa graduate fellowship, Spain's NSF-equivalent awarded by the king, for which I presented a research agenda to study the digital economy from a macroeconomic perspective. My educational background includes a M.Sc. in Economics from Universitat Pompeu Fabra in Barcelona, where I studied under macroeconomists Jordi Gali and Xavier Sala-i-Martin, and undergraduate studies at the University Complutense of Madrid and at the University of California, Berkeley. Prior to starting graduate school, I worked at the NBER and MIT as a research assistant for Amy Finkelstein in various applied econometrics projects triangulating across large, administrative micro data sets. Also at NBER, I helped Diego Comin on paper on structural transformation estimating a macro model aggregating from micro data. One of my primary goals for the Ph.D. is to investigate how to better combine micro data together with micro-founded macroeconomic models that study economic growth and business cycles. I would like to employ the tools I learn and help develop to study the aggregate consequences of digitization, with a current emphasis on consumer-augmenting technological change.

At Harvard, my current mentors (and likely future advisors) include Josh Lerner, Robert Barro, and Emmanuel Farhi. Professor Lerner has been an invaluable asset in my first steps towards research. Last summer I started a solo project investigating directional shifts in the technology sector innovation production function using venture capital portfolio firm data. I obtained preliminary evidence that since the early 2000s the technology sector has been substituting towards the supply of consumer technologies relative to the producer technologies

emphasized in traditional macroeconomic models. The mass adoption of production intermediates (e.g. enterprise software) is well known to have partly fueled the "productivity miracle" of the 1990s; in contrast little is known about the effects of the mass adoption of consumer technologies, whose economy-wide effects might be very different, and the connection between the two. Guided by Professor Barro, I am thinking about a theoretical framework incorporating consumer technologies into classical macro models that would tie these patterns with the aggregate productivity slowdown that has taken place since 2004. In particular, I want to bring forward the importance of the diffusion of general purpose technologies such as the internet and smartphones among consumers in the context of macroeconomics. Further, I am using firm-level and household-level micro data to establish the robustness of my preliminary stylized fact (the rise in importance of consumer relative to producer technological change), study what factors may be driving it, and its aggregate implications. By using technology adoption data at the firm level, for example, I want to study whether changes in demand for technology by businesses around the period of diffusion of the internet among households could be driving an endogenous shift in the technology sector.

Finally, I am working on an early stage project under Professor Farhi that aims at establishing the empirical and theoretical microfoundations that would allow us to trace out the aggregate production function and its dynamics. The basic idea is that the presence of interconnectedness, complementarities, and rigidities can act as amplifiers of the macroeconomic impact of firm/industry-level dynamics. I intend to use the methods and conclusions of this work for my particular set of questions on digitization from a macroeconomic perspective.

As part of my main field courses, I am currently taking second-year coursework in Advanced Macroeconomics taught by Ufuk Akcigit and Philippe Aghion, who are bringing us to the frontier of the literature in economic growth, including firm dynamics models that inherit from the Schumpeterian growth paradigm, and a breadth of models of step-by-step innovation, directed technical change, aggregate misallocation, and networks in the macroeconomy. As part of this course, I am taking the first step towards the analysis of my consumer vs producer technology project using a model of technology firm dynamics and my firm-level micro data. This year, I will also take coursework in macro computational modelling and estimation, with an

emphasis on heterogeneous agents methods, with Ben Moll and Jesús Fernández-Villaverde. During my second year, I plan to take Daron Acemoglu's survey course on technical change in macroeconomics at MIT, Ariel Pakes' empirical Industrial Organization courses, as well as some finance classes and further training in econometrics to complement my education.

Per Professor Learner's suggestion, I have been attending the lunch seminar at the NBER Productivity group and the Harvard Innovation & Entrepreneurship team, as well as some of the IDE seminars at MIT. I have especially enjoyed presentations by Erik Brynjolfsson and coauthors about the consumer surplus implications of consumer technologies (as an alternative to traditional GDP measures), as well as John van Reenen and coauthors about the rise of dominant firms and their productivity and labor share implications.

In conclusion, I would like to become part of the highly active digitization group. I believe bringing a macroeconomic perspective into this rising field would be fruitful, if bringing together theoretical models with empirical approaches that use micro data.