Application for NBER Digitalization Tutorial, March 17 – 18, 2021

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Graduate Coursework:

PhD (in progress since 2018), New York University, Stern School of Business, Strategy

MBA (2014 – 2016), University of Chicago, Booth School of Business

MA (2008 – 2010), Duke University, Economics

I have completed all of my graduate coursework. I am currently in my third year of the PhD program, and I am starting to work on my dissertation. I have taken the graduate sequences in microeconomics and econometrics. I have also taken seminars in strategy, organizational theory, entrepreneurship, the economics of AI, innovation/technological change and social networks, and additional methods courses in research design and time series econometrics.

Research Interests:

I attended the Digitization Tutorial last year (at the start of this pandemic...) and thought it was an incredible learning experience. Both the materials that were chosen and the faculty presenters' prior work resonate with my research interests. I am applying again this year because I want to become even more familiar with this material and become part of this academic community.

Over the past several years, my interests have developed to include digital communications, high-tech corporate accelerators and venturing, and entrepreneurship around AI. However, these interests remain firmly rooted in digitization in the fields of strategy and organizational economics. At NYU Stern, I work with my advisor, Robert Seamans, on several projects that examine the organizational impacts of AI. Additionally, I work with Raffaella Sadun at Harvard Business School on using communications metadata to study the impact of key organizational events (CEO change, COVID) on collaboration. For my dissertation, I plan to examine how the AI production industry disconnects from prior theories of industry evolution, partly due to its reliance on data as a resource in production.

I previously worked at Microsoft Corporation, which enabled me to learn about technological product development, marketing, and sales. As I complete the PhD, I continue to collaborate with large high technology companies to access the data and expertise needed to test theories and advance my research.

Below is a list of my current publications, working paper, and projects with a brief description.

Publications & Working Papers:

Communications Metadata:

Collaborating During Coronavirus: The Impact of COVID-19 on the Nature of Work with Evan DeFilippis, Madison Singell, Jeff Polzer, and Raffaella Sadun (http://dx.doi.org/10.2139/ssrn.3654470).

We explore the impact of COVID-19 on employee's digital communication patterns through an event study of lockdowns in 16 large metropolitan areas in North America, Europe and the Middle East. Using de-identified, aggregated meeting and email meta-data from 3,143,270 users, we find, compared to pre-pandemic levels, increases in the number of meetings per person (+12.9 percent) and the number of attendees per meeting (+13.5 percent), but decreases in the average length of meetings (-20.1 percent). Collectively, the net effect is that people spent less time in meetings per day (-11.5 percent) in the post-lockdown period. We also find significant and durable increases in length of the average workday (+8.2 percent, or +48.5 minutes), along with short-term increases in email activity.

Measuring Communications in Modern Organizations with Raffaella Sadun & Andrea Prat (AEA Papers & Proceedings 2020)

We investigate a new empirical approach to measure differences in large samples of firms using email and meeting metadata. The methodology exploits detailed (and completely confidential) metrics on internal email communications and in-person and virtual meetings to compute basic network metrics at the firm and department levels. The paper discusses the preliminary evidence on cross-firm variation in communication structures emerging from the data, as well as the relationship between these metrics and other firm-level characteristics.

Communication and Collaboration amidst CEO Change with Raffaella Sadun & Andrea Prat (Currently pending internal privacy review).

The relationship between CEO turnover and internal firm-level communications is still largely unknown. In this paper, we use novel, firm-level measures derived from communications metadata across time measured before and after a CEO change to determine if managerial turnover impacts patterns of communication and collaboration among employees. We find that CEO change leads to an initial decrease in internal communication, followed by a significant increase in meetings and emails approximately four months after the turnover event. We also find that larger increases in communication after a CEO transition are associated with increases in firm stock prices.

AI Startups:

For the last three years, with the Kauffman Foundation's support, we have run two surveys targeting AI startups to better understand the entrepreneurial landscape around AI product creation. We will run the third survey in November 2020.

Barriers to Growth in Developing AI with Jim Bessen, Rob Seamans, and Lydia Reichensperger (Under Review, Research Policy).

Artificial intelligence ("AI")-enabled products are expected to increase labor productivity and drive macroeconomic growth. For these gains to be fully realized, it is important for AI startups to raise the funding needed to develop their underlying AI technologies and resulting products. Training data are important to startups developing AI; without training data, the startups cannot develop their algorithms. However, there is no consensus in the literature on aspects of training data that are most important to funding outcomes. In this paper, we develop a framework for characterizing training data as a resource

derived from relationships with customers and suppliers, and then we use this framework to describe conditions under which such data can lead to growth. Using unique survey data of AI startups, we find that startups that have relationships with cloud services providers coupled with access to additional proprietary training data from suppliers, above and beyond access to proprietary customer data, are more likely to acquire the funding needed to grow.

GDPR and the Importance of Data to AI Startup with Jim Bessen, Rob Seamans and Lydia Reichensperger (Available at SSRN 3576714.)

What is the impact of the European Union's General Data Protection Regime ("GDPR") and data regulation on AI startups? How important is data to AI product development? We study these questions using unique survey data of commercial AI startups. AI startups rely on data for their product development. Given the scale and scope of their business models, these startups are particularly susceptible to policy changes impacting data collection, storage and use. We find that training data and frequent model refreshes are particularly important for AI startups that rely on neural nets and ensemble learning algorithms. We also find that firms with customers in Europe are significantly more likely to create a new position to handle GDPR-related issues or to reallocate firm resources due to GDPR.

The Business of AI Startups with Jim Bessen, Rob Seamans and Lydia Reichensperger (https://papers.ssrn.com/-sol3/papers.cfm?abstract_id=3293275)

New machine learning techniques have led to an acceleration of "artificial intelligence" (AI). Numerous papers have projected substantial job losses based on assessments of technical feasibility. But what is the actual impact? This paper reports on a survey of commercial AI startups, documenting rich detail about their businesses and their impacts on their customers. These firms report benefits of AI that are more often about enhancing human capabilities than replacing them. Their applications more often increase professional, managerial, and marketing jobs and decrease manual, clerical, and frontline service jobs. These startups sell to firms of different sizes, in different industries and nations, but the distribution of activity is distinct from that of larger firms. Firms serving EU customers appear to use higher levels of data protection.

Other Research Projects in Progress:

The Impact of Corporate Accelerators with Josh Lerner, Robert Seamans, and Nataliya Langburd Wright.

How does a startup's participation in large technology firms' corporate accelerator program impact the startup's performance (i.e., the startup's ability to innovate, scale up, and reach global markets)? We collaborate with a large technology to learn more about startup performance, types of technology developed, and cross-border expansion of startups "graduating" from the Corporate Accelerator Program. A key finding of this project will be to what extent does access to large technology firms' programs impact startups' ability to expand internationally through the types of technologies they develop.