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Volume Author/Editor: Shane Greenstein, Josh Lerner, and Scott Stern, editors

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Innovation Policy and the Economy: Introduction to Volume 17

Shane Greenstein, *Harvard University and NBER*

Josh Lerner, *Harvard University and NBER*

Scott Stern, *Massachusetts Institute of Technology and NBER*

This volume is the seventeenth annual volume of the National Bureau of Economic Research (NBER) Innovation Policy (IPE) group. The IPE group seeks to provide an accessible forum to bring the work of leading academic researchers to an audience of policymakers and those interested in the interaction between public policy and innovation. Our goals are:

- to provide an ongoing forum for the presentation of research on the impact of public policy on the innovative process;
- to stimulate such research by exposing potentially interested researchers to the issues that policymakers consider important; and
- to increase the awareness of policymakers (and the public policy community more generally) concerning contemporary research in economics and the other social sciences that usefully informs the evaluation of current or prospective proposals relating to innovation policy.

This volume contains revised versions of the papers presented in the group's meeting in Washington, DC, in April 2016. For the seventeenth volume of this series, we decided to focus on events of the past two decades. The landscape of innovation in digital markets has been changing rapidly. The papers in this volume offer insights into these changes by highlighting recent developments in one broad area—the consequences for innovation in digital markets.

In the first chapter, Joel Waldfoegel discusses how reduced costs of production have resulted in a “golden age of television.” He argues that this development has gone underappreciated, and his paper characterizes this “golden age” and its main cause, digitization.

More to the point, the impact of digitization on television has been

similar to its impact in music, movies, and books. In all of these activities, digitization has reduced the costs of production, distribution, and promotion. It has had major consequences for both the number of new products made available as well as the realized quality of the best new products. Cost reductions, along with relaxed gatekeeping constraints, make possible the creation of additional content.

That frames an empirical exercise. The appeal of new products is inherently unpredictable, and some of the new products turn out to be surprisingly good. How does that manifest in observable features of television? New data from a variety of sources helps to explore the evolution of television quality in the digital era. Waldfogel documents substantial growth in the number of new shows. He also shows evidence of an increase in the quality of the best work. New kinds of shows—made possible by digitization—account for the substantial and growing shares of most successful shows.

Marc Rysman and Scott Schuh provide the second paper. This paper discusses the prospects for innovation in payment systems, including mobile payments, faster payment systems, and digital currencies.

After briefly discussing the history of digitization in payments, the authors turn to evaluate prospects and barriers for several new technological innovations in payments. They focus on the prospects for innovation in retail payments, namely, payments among consumers or between consumers and retailers.

Rysman and Schuh focus on three important innovations in the payments system that have the potential for widespread adoption, and, as a result, are the subject of current policy debate. The first is mobile payments, the ability to use a mobile telephone to make retail payments. The second is the prospect for a real-time payment system in the United States. Even with modern digital payment systems such as the credit card network, the debit card network, and the Automatic Clearing House ([ACH], used for, among many other things, the direct deposit of paychecks), payments are not settled between banks for at least a day, and often longer. The third technology is digital currencies, such as Bitcoin, which has received considerable popular discussion. All three make intense use of the Internet and computing power, all three raise important security issues, and all three threaten the traditional business model of banks.

Catherine Tucker and Amalia Miller write the third paper. They analyze the consequences of patient data becoming virtually costless to store, share, and individualize. They then show how data management and privacy issues have become a key factor in health policy.

Motivating the paper is the widespread shift away from a system where patient data was essentially temporary, when reuse was not intended, and information was not easily accessed. In its place is emerging a new digital world where patient data is easily transferred and accessed repeatedly.

This paper argues that some of the most pressing future policy questions concern the use of digital technologies and digitized data to analyze patient health. The fundamental deepening of patient data enables increased personalization of health care for each individual patient. Policy concerns arise in numerous places. Those questions are not only based on the prospects for doctors to use a person's detailed medical history, but also access a person's genetics. A person's likely future medical history can be projected from genetic makeup. They emphasize that issues of data management and privacy are now at the forefront of health policy considerations.

Michael Luca provides the fourth paper, which covers online marketplaces, and the design challenges faced by platforms. Online marketplaces have proliferated over the past decade, evolving far beyond the pioneers such as eBay and Amazon. Specialized platforms such as Airbnb, Uber, and Upwork have created new markets where none existed and pushed a growing fraction of the economy online.

The paper provides an economist's tool kit for designing an online marketplace. In contrast with most offline markets, online marketplaces are designed by organizations whose rules shape market outcomes. Market designers wield considerable power. Their rules determine whether a given platform is better for newcomers or experienced participants, or buyers or sellers, and whether participants abide by or break the law.

The discussion focuses on central issues for policy, such as how platforms build trust and reputation while avoiding discrimination and inequality. Over time platforms have become increasingly "social," providing information not only about the products or services being sold, but also about buyers and sellers. The sharing of user information can increase trust (one market-design goal), but it may also facilitate discrimination (an unintended side effect). Luca explains all of this in accessible terms, and, thus, provides essential reading for any policy-maker looking to get an overview of the frontier issues in this growing area.

In the fifth paper, Tim Bresnahan and Pai-Ling Yin characterize information and communication technologies in the workplace and discuss the long-lasting implications for the labor force. They address one of

the burning issues of this era, how wages vary with increasing demand for smart managers and professionals and workers with organizational participation skills.

They analyze the view that penetration of computing and networks into white-collar work is a process of *substitution of machine work for human work*. To some observers, advances in artificial intelligence will accelerate the *substitution* of machine work for human work. They question the central assumption of the end-of-work forecast, namely, that smarter and smarter software permits computers to *substitute* for more highly skill-intensive and knowledge-intensive human work.

They argue that substitution occurs at the level of the *production process*, not at the level of the *task* within these processes. In this view, the adoption of digital technologies in the workplace has NOT primarily been about substituting machine work for human work. Instead, the central change has been in creating new products and services, in changing incentives inside organizations, in modularizing production flows, and in introducing new production processes to (slowly) compete with older ones. They observe the rise in the marginal product of managers and professionals, among other kinds of workers.

They end by building a forecast for the importation of digital technology into the workplace. They argue that contemporary events look remarkably like the early stages of all of the other occasions in which valuable new technology, especially computing, has been brought into the workplace. These insights have important implications for workforce policy.

Together, these five papers highlight several distinctive innovation policy issues that arise as a consequence of digitization. Digitization is shifting both the benefits and costs of innovation, and these papers offer rich empirical evidence about how digitization is impacting critical areas influenced by policy. While the issues involved are undoubtedly difficult, the chapters in this year's volume continue to suggest that contemporary research in economics informs the evaluation of current and prospective innovation policy alternatives.

Endnote

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