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Platforms, systems competition, and innovation: Reassessing the foundations of communications policy

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ABSTRACT

Focusing on the effects of policy on investment and innovation this paper examines whether the conceptual foundations of sector regulation are aligned with the current technological and economic conditions of advanced communications. One conclusion is that the prevailing theories and practices are only adequate if the policy challenge can be reasonably approximated as a static or steady-state problem but they may have serious shortcomings if this is not possible. The article proceeds with a review and critical examination of two approaches that could augment or possibly replace the traditional approach under conditions of dynamic competition—the theory of platform markets and systems approaches. Both frameworks model aspects of competition in interconnected systems in more detail and offer novel insights to inform communications policy in an era of continuous change. Nonetheless, important theoretical and implementation gaps remain that will require additional efforts by researchers and practitioners.

1. Introduction

This article explores the implications of the changed economic and technological conditions of information and communication industries for communications policy. Particularly the plasticity and generativity of digital production technologies raise interesting new challenges. A growing body of research on network industries suggests that to be effective policy needs to be aligned with the technological conditions of the system to be governed (see Künneke, Groenewegen, & Ménard, 2010). It is therefore rational for policy makers to review whether and how sector governance should be adapted to better support investment and innovation in the digital economy. While traditional goals such as universality of access, affordable prices, and high reliability continue to be important, supporting investment and innovation has moved to the forefront of the policy agenda. Yet knowledge of the conditions that facilitate investment and innovation in technologically dynamic sectors is less robust than our understanding of the prerequisites of efficient regulation under static or steady-state technology. Recent efforts to develop better models of how regulation affects innovation are promising, especially if they are combined with theories that grasp the dynamic aspects of innovation better than mainstream regulatory theory.

The increased reliance on IP networking and the Internet requires reconciling two different yet complementary realms of governance—traditional telecommunications sector regulation and Internet governance—a task fraught with considerable tensions (Mueller & Van Eeten, 2013). Whereas government policy is promulgated and implemented in formal and often

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hierarchical procedures, Internet governance relies on a mix of formal and non-formal multi-stakeholder settings with participants, rules of engagement, and powers of enforcement that are different from and sometimes orthogonal to traditional government regulation. Much of regulatory theory and practice originates in monopoly regulation and in problems associated with the transition from monopoly to a more open market environment. Internet governance cannot yet refer to a comparable standard body of normative foundations. Much of it is rooted in a strong trust that networked coordination is workable for a wide array of governance tasks (Mueller, 2010). Although there is a track record in support of this premise, the conditions under which network governance is effective and principles of how it can best be organized are not fully explored and continue to evolve.

Three interwoven developments during the past decades have fundamentally altered production and use of Internet-based services. One trajectory is the evolution of communication networks from specialized infrastructures to general purpose platforms capable of supporting a broad range of applications and services. A second development is increased and ubiquitous connectivity at increasing speeds in combination with more powerful fixed and mobile devices. The third element is advances in computing power and the adoption of modular system architectures. Taken together, these developments have greatly increased the plasticity and generativity of digital production technology. Plasticity allows the production of digital services and applications with multiple factor combinations at often radically different costs (e.g., online video via best-effort Internet connections, peer-to-peer communications (P2P), and content delivery networks (CDNs)). With few exceptions, most products and services can be produced with alternative technologies but in a digital environment such flexibility abounds. The resulting greater plasticity allows new, non-traditional players to enter the market and hence significantly alters patterns of competition. Generativity refers to the greatly expanded space of innovation opportunities opened up by digital technology and the accelerated pace at which it is being explored. It also has direct consequences for the intensity and dynamics of competition.

These changes have greatly altered and will further influence investment and innovation in the ICT sector. They have also affected the technical and business relations in the advanced information and communication system. Public policy—despite efforts to adapt to the new industry structure—continues to be largely based on conceptual models and practices that were developed under different economic conditions. Periodic mismatches between the economic and technological basis of a sector and the principles informing its governance are to be expected in a dynamically evolving industry. An increasing number of policy-makers and academics are concerned about this incongruity as it may result in erroneous public policy choices (e.g., Ballon & Heesvelde, 2011; Bauer & Bohlin, 2008; Serentschy, 2013; Whitt, 2007; Yoo, 2012). Despite the widely shared sentiment that a new round of reforms is needed, considerable differences exist among stakeholders in the diagnosis of the most pressing issues and the appropriate courses of action. Some experts find strong reasons for less regulation and stronger reliance on decentralized market coordination (e.g., Eisenach, 2012; Yoo, 2012) but others identify a need for continued and new forms of interventions in response to the logic of the digital economy (e.g., Bourreau, Cambini, & Hoernig, 2012; Cherry, 2007; Crawford, 2013; Noam, 2010; Wu, 2003).

The main objective of this paper is a review and critical evaluation of the conceptual and practical foundations of public policies, paying special attention to the facilitation of network investment and innovation in advanced communications. We focus on two promising approaches—the theory of platform markets and systems approaches—to assess their potential contribution to the development of a forward-looking framework for ICT governance. To set the stage, section two discusses potential mismatches between the structure and functioning of advanced communication systems and the prevailing paradigm of regulation. Given the importance of multi-sided market relations, section three discusses the notion and regulatory implications of competition in platform markets. Section four revisits the interaction of competition, regulation and innovation from a dynamic system perspective. General implications for the design of a governance framework capable of supporting investment and innovation processes are explored in section five. Specific lessons for communications policy are addressed in section six before the most relevant points are reiterated in the concluding remarks.

2. Reassessing the conceptual foundations of regulation

During the past three decades, in response to national and regional contexts, regulatory practices have been primarily designed and refined to address problems of market failure and deficiencies. The institutional and regulatory reforms put in place since the 1980s have helped unleash and accelerate the innovative power of digital technology. Even though many utopian and visionary expectations were not fulfilled, substantial improvements in metrics such as access and usage, prices, and the number and diversity of available applications and services are observable (Cowhey & Aronson, 2009; OECD, 2013). These observations suggest that the policy model, under the specific industry conditions, helped move the system toward higher performance compared to the prior monopolistic sector organization. The continuing changes in the technological and economic sector conditions beg the question whether this post-monopoly regulatory paradigm continues to be appropriate. Particularly four areas may require reconsideration: the static nature of regulatory theory, the insufficient attention to interdependencies in the ICT system, the assumption of costless regulation, and the endogeneity and co-evolution of regulation and performance.

Regulatory theory has undoubtedly made significant advances during the past decades. The influx of game theory, stronger reliance on formal models, and richer empirical data have added rigor and deepened the understanding of good regulation. At the same time, the theoretical and practical underpinnings of regulation continue to be rooted in static equilibrium models of the economy, with many of its principles derived from the theory of optimal monopoly regulation.