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Reconciling Political and Economic Goals in the Net Neutrality Debate

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The net neutrality debate is one of several sites of struggles to adapt and redefine rights and obligations of stakeholders in the Internet-centric communications system. Its outcomes will shape the future of the Internet and influence the level and distribution of its benefits. We identify key values that drive the net neutrality discussion and examine the governance mechanisms proposed to achieve these objectives. We find that there is no single policy instrument that allows realization of the range of valued political and economic objectives simultaneously. Contrary to some of the claims advanced in the current debate, safeguarding multiple goals requires a combination of instruments that will likely involve government and nongovernment measures. Furthermore, promoting goals such as the freedom of speech, political participation, investment, and innovation calls for complementary policies.

Keywords free speech, innovation, Internet, investment, neutrality, openness

At the heart of the net neutrality debate is an institutional design problem: finding and implementing a set of governance mechanisms and a broader governance regime that advances the benefits of the Internet as its technological, economic, and political conditions continue to evolve.

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This debate unfolds in parallel to the broader discussion over an open Internet, with the need to preserve and protect the “openness” of the Internet widely perceived as a precondition to the realization of the Internet’s potential. Attaining an effective and sustainable governance approach requires sufficient agreement among stakeholders about the objectives to be realized and about the working of the system to be governed. At an abstract and generic level, the image of the Internet as a space of free economic and political experimentation and innovation is similarly invoked by netizens, technology industries, policymakers, and governments. Nonetheless, the specific operationalization of this vision, the nature and origins of threats to it, and its boundaries remain ambiguous and contested. This is in part due to divisive economic and political conflicts among stakeholders. However, it also reflects different perceptions of the working of the Internet ecosystem, particularly the factors that shape good performance.

While cognizant of the political economy of Internet governance, we focus on the institutional design issue. The article explores whether currently existing and alternative proposed governance mechanisms can achieve the sets of political and economic goals that are at the heart of the discourse. The complexity of the information and communication technology (ICT) system and the possible outcomes of different governance approaches are daunting. As a result, discourses have fragmented into political, economic, and governance aspects without sufficient efforts on bridging divides. Preserving the freedom of speech, creating conditions that facilitate network investment, and building on the successful network governance model of the Internet are important objectives in their own right and raise many issues that deserve attention. But a narrow

focus risks creating “viewpoint bias”: stakeholders primarily interested in political goals assert that their proposed solutions also promote economic objectives, whereas stakeholders primarily driven by economic concerns insist that measures to promote investment and innovation simultaneously enhance free speech. These claims have persisted throughout the history of the net neutrality debate and have contributed to a discussion that is often constrained by stylized assumptions.

We posit that a lack of clarification of the various aspects of the net neutrality debate muddies the water. We further propose that overcoming this issue requires an integrated discourse encompassing both *values* and *instruments*. The former informs decisions on what ends ought to be sought (an “end–end” perspective) (Thacher 2004), whereas the latter addresses the conditions under which such goals can be realized in an effective and efficient manner (a “means–end” perspective). Bringing these two dimensions together by ensuring that efficient means reach valued ends is a central challenge of policy design (Flyvbjerg 2001). We seek to contribute to the discussion by analyzing political and economic aspects of the net neutrality debate in an integrated framework. To keep issues manageable, we focus on governance in political systems based on the rule of law and a tradition of free speech. One of our central theses is that a workable solution to the issues driving the net neutrality debate is critically related to clarifying the value and instrumental components of the issues and to proactively balance them. To this end, we begin with a brief review of political, economic, and other reasons that are used as rationales to argue for or against specific forms of net neutrality. The next section analyzes the net neutrality discussion as an institutional design and governance problem. The subsequent two sections examine the issue through the lenses of value rationality and instrumental rationality. We proceed in the last section with an analysis of alternative governance mechanisms and their power to contribute to realizing the objectives reviewed in the previous sections.

We approach this task by examining theoretical and empirical research for evidence of whether a policy instrument is a sufficient and/or a necessary condition for a desirable outcome, based on what we know about the working of the Internet. If a policy intervention is sufficient to achieve an objective, putting a policy in place will assure its realization. If a policy is necessary, the outcome cannot be achieved without it but other conditions or policies will have to be in place as well. If a policy is neither necessary nor sufficient, it will typically be of limited use to achieving an objective. Based on this analysis of linkages between policies and outcomes we conclude that, contrary to many existing arguments, no single policy instrument can achieve widely shared economic and political goals simultaneously. However, certain combinations

of instruments, particularly permission to differentiate services linked with safeguards against unwanted discrimination, go a long way toward that end. Our article proposes a new way of reconciling political and economic goals in a sustainable framework. Furthermore, it highlights that complementary policies are needed to fully harness the benefits of the Internet.

BACKGROUND

The net neutrality debate is a response to political, economic, and social changes that are transforming the Internet and its historical governance arrangements. The policy discussion emerged as a response to changes in U.S. telecommunications policy, particularly the elimination of common carriage obligations on broadband access providers beginning in 2001 (Cherry 2006; Sandvig 2007). These policies were considered by many stakeholders as a weakening of important legal and regulatory protections of an “open” Internet, widely seen as one of the preconditions of its innovative prowess.¹ From its origins in the United States, the debate gradually spread to other countries and international policy forums (e.g., the Netherlands, Chile, Canada, and the European Parliament), although the specific issues vary in response to national and regional policies that govern Internet access. While the current focus is on transactions between network operators, content and application providers, and users, the concerns and the relevance of the issues are pervasive throughout the entire ICT system.

Devising sustainable governance proposals requires a clear understanding of the tectonic forces behind the net neutrality debate. In its present form, the discussion emerged from the confluence of contradictory technical, economic, and political forces that challenge the historical arrangements rooted in voluntary agreements and the end-to-end technical architecture (Blumenthal and Clark 2001; Van Schewick 2010). A first set of forces is related to technical developments, particularly the ability to examine the content of each individual datagram using techniques such as deep packet inspection (DPI). This capability allows not only the (desirable) filtering of malicious traffic and benign forms of traffic management but also the identification of sender, content, and recipient of the packet, opening doors to potential abuses to discriminate against competitors and political opponents.

A second set of factors is related to the diversification of users and uses, especially the fast growth of video, mobile, and user-generated data. This has created considerable new challenges for network operators attempting to manage existing network capacity and support investment in next-generation infrastructures (Friederiszick, Kałuzny, Kohnz, and Röller 2011). New business models, including bundled offers and usage-sensitive pricing, are introduced

by network operators and other stakeholders in search of sustainable responses to the rapid growth of information flows and the increasing diversification of uses and users. As a considerable share of value generation and profits has migrated to applications and services, network operators without a presence in these markets claim to have difficulties in raising sufficient capital for network upgrades and investment in next-generation fixed and mobile access networks.² Differentiation of prices and services, a strategy that has been more aggressively pursued in the United States because of less stringent regulation, is a market-driven response to these developments. However, given highly concentrated network access markets and vertical integration of many network operators, there is an uneasy tension between these strategies, fair competition, and political goals associated with an open Internet.³

A third set of forces is tied to the unique governance regime of the Internet. In principle, its technical architecture promotes political and human rights such as free speech and communication (e.g., Nunziato 2009). However, global growth to more than 2.3 billion users by 2012 has expanded its reach to an increasing number of authoritarian political regimes and cultures that have different conceptions than more libertarian societies of the freedoms facilitated by the Web. Recent generations of technology also enable more sophisticated forms of surveillance, suppression of political speech with far-reaching implications for privacy and individual freedom (Levmore and Nussbaum 2010; Morozov 2011). These political together with economic factors are instigating pressures on the existing national and global governance frameworks of the Internet. Not only will principles of traditional telecommunications regulation have to be reconciled with the networked governance forms of the Internet, a forward-looking approach will likely be affected by the diverse policy models that coexist around the world. Hence, the net neutrality debate is also a response to the question of whether this historical, bottom-up approach is sufficient in the present environment or whether its self-regulatory arrangements will need to be fortified or even replaced with other instruments that provide different enforcement options.

Workable governance will have to take these forces of transformation and diverse stakeholder perspectives into account. Finding and implementing such an approach is contingent on clarifying the values that ought to be pursued, as well as development of a better understanding of how different governance approaches affect important technical, economic, and political performance characteristics of the sociotechnical system Internet, such as a high innovation rate, unrestrained speech, and ubiquitous access. (Finding a feasible way forward is also contingent on the political economy of net neutrality, but as mentioned this aspect is beyond the scope of this article.) We

look at the complexity of the economic and political issues and the challenges they create in the following section.

NET NEUTRALITY AS AN INSTITUTIONAL DESIGN PROBLEM

From a theoretical perspective, the issues raised in the net neutrality debate constitute an institutional design problem. It is a quest for a set of governance mechanisms and a broader governance regime that can preserve and safeguard the benefits of the Internet for society. As the technical and economic conditions of the Internet have evolved from its inception, views of which governance regime can best safeguard these benefits have become contested. Stakeholders differ widely in their outlook as to the most effective framework, and their proposals span the range from laissez-faire to strict forms of regulation. Moreover, because the debate is contingent on historical and political contexts, deviations exist among national and regional debates (e.g., Powell and Cooper 2011). To set the stage for our comparative analysis of alternative policy designs, this section briefly discusses the concept of governance and its relevance for the net neutrality debate.

The notion of governance refers to all arrangements intended to coordinate actors and processes in a sociotechnical system (Mayntz 2003). It includes government and nongovernment, mandatory and voluntary institutional arrangements. This interpretation largely corresponds to its uses in the community of Internet researchers (Brown 2013; Brown and Marsden 2013).⁴ It is also compatible with the definition of Internet governance proposed by the Working Group on Internet Governance (WGIG 2005).⁵ Not all governance mechanisms are deliberately designed, as some emerge from repeated interactions among players (Greif 2006; Ostrom 2005). Indeed, many aspects of Internet governance evolved in such a bottom-up process, particularly the inclusion of civic society actors and the reliance on networked forms of governance (e.g., Mueller 2010). Table 1 highlights alternative options proposed by stakeholders to achieve the benefits of the Internet. Not only do they represent different instrumental choices, they also reflect different overall visions of the Internet.

Although networked forms of coordination are widely used in the current Internet governance regime, other mechanisms are also important. Overall, the governance regime is better described as a hybrid that includes elements of government regulation (e.g., network infrastructure), co- and self-regulation (e.g., privacy protection, online advertising), networked coordination (e.g., agreements within IETF, the Internet Engineering Task Force), private ordering and market decisions (e.g., security decisions made by ISPs), and emergent norms (e.g., online etiquette on blogs) (e.g., Latzer, Just, Saurwein, and Slominski 2003; Mueller and Van Eeten 2013; Schneider

TABLE 1
Alternative governance arrangements proposed to safeguard the Internet's benefits

Governance arrangement	Main features	Implementation options
Strict neutrality	Each datagram is treated equally, ISPs are not allowed to differentiate based on origin, destination, or content (possibly with the exception of certain types of illegal traffic)	Continued reliance on networked self-regulation; ex post regulation; legal and regulatory safeguards
Prohibition of blocking	ISPs must not block the dissemination of information, access to information, and use of devices (as long as they are legal)	Legal and regulatory provisions; ex post regulation; possibly voluntary agreements and self-regulation
Zero price constraint on network operator	ISPs are not allowed to charge termination fees from content and application providers	Legal and regulatory provisions; ex post regulation; possibly voluntary agreements and self-regulation
Minimum quality of service tier	ISPs are required to offer a minimum quality of service tier that is openly accessible by content providers and users	Legal and regulatory provisions; ex post regulation; possibly voluntary agreements and self-regulation
Quality of service tiering with nondiscrimination safeguards	ISPs are allowed to differentiate quality of service tiers as long as they are offered on a nondiscriminatory basis to requesting entities	Legal and regulatory provisions; ex post regulation; possibly voluntary agreements and self-regulation
Quality of service tiering	ISPs are allowed to differentiate quality of service tiers and discriminate among content and application providers as long as they do not violate competition law	Antitrust supervision; possibly ex post regulation

and Bauer 2007; Take 2012). These arrangements, and the instruments they apply, together form the unique Internet governance regime (Brousseau, Marzouki, and Méadel 2012; Hofmann 2005; Mathiason 2008; Pavan 2012). Political and economic changes have created pressure to reassess and possibly modify the legal and policy framework governing the Internet. In the United States, common carrier obligations on telecommunications carriers provided strong safeguards against discrimination of network operators against content providers and device manufacturers. When broadband Internet access was removed by the FCC from this classification, a key safeguard was weakened. Net neutrality can be seen as an attempt to design similar safeguards in advanced communication networks (Cherry 2006; Sandvig 2007).

In the course of these discussions, alternative meanings of a “neutral” net and possible policy options to safeguard it were introduced (Krämer, Wiewiorra, and Weinhardt 2012; Peha, Lehr, and Wilkie 2007).⁶ A strict version of net neutrality emphasizes that “Internet service providers may not discriminate between different kinds of online content and apps.”⁷ Envisioned as a data transportation infrastructure that treats every bit alike, this network architecture is seen as a precondition for the “right to use

any equipment, content, application or service without interference from the network provider.”⁸ Such a radical requirement has not been implemented in the Internet historically nor is it required by end-to-end connectivity (Blumenthal and Clark 2001). Although strict neutrality could be achieved via voluntary self-regulation, given the new economic conditions prevailing in the Internet, it most likely would require specific legislative or regulatory rules to enforce it.⁹

Other contributors construe the term “neutral” more narrowly and deem some forms of differentiation as compatible with the notion of a “neutral” Internet. Proposals differ, however, with regard to the safeguards envisioned to prevent potential violations of “neutrality,” ranging from general obligations on Internet service providers (ISPs) to reliance on case-by-case approaches. A no blocking rule would prevent network operators from prohibiting use of or access to certain devices, applications, and services. It would be subject to properly defined exemptions for security reasons and other legitimate purposes. Furthermore, a no blocking rule would allow other types of network management, including usage-based pricing. A zero-price rule would prohibit ISPs from charging content and application providers for the termination of traffic to users.

As in the case of no blocking, ISPs would be allowed to price differentiate service qualities and prices for users (Lee and Wu 2009). Either rule alone, while not blocking content, cannot prevent the marginalization of content and applications for which purchasing power or interest is limited.

Seeking to address this aspect, a third approach would require ISPs to make a minimum-quality service tier available on a nondiscriminatory basis (Brennan 2011). Beyond that tier, differentiation is admissible and could be safeguarded by means of competition law. Two groups of proposals allow even stronger forms of differentiation. One, more modest, proposal is to allow reliance on multiple quality of service tiers as long as they are offered on a non-discriminatory basis to any requesting party. A more radical market-based proposal is to allow price and other forms of differentiation vis-à-vis content and application providers and users as long as no competition or consumer protection rules are violated. For each of these arrangements alternative implementation options are available (although not all may be equally effective).

Optimal governance would implement arrangements that are capable of securing political goals commonly associated with an open Internet, such as free speech, as well as economic objectives, such as desirable investment and innovation rates. As the choice of governance instruments is dependent on the national context, it is not surprising that national and international policymakers have responded in different ways. The United States pursued a dual approach, creating more economic flexibility while safeguarding its vision of an open Internet, in a 2005 policy statement and the subsequent Open Internet Order (FCC 2010).¹⁰ A handful of other countries have adopted net neutrality rules (the Netherlands, Chile, and Canada).¹¹ Regional bodies have embraced net neutrality as a basic principle for future policy design or encouraged national regulatory agencies to defend it.¹² Several stakeholders, led by a coalition of European network operators organized in the European Telecommunication Network Operator Association (ETNO), sought to include new principles of international data traffic management and pricing into the International Telecommunications Regulations (ITRs) negotiated at the World Conference on International Telecommunications in Dubai in December 2012.¹³

These initial responses are pragmatic and not the end of the debate, as an increasing number of countries have started to look into the issues. Moreover, established policies are subject to court and other political challenges and may have to be redesigned in the future. A better understanding of the effectiveness of different instruments and implementations is therefore needed. An assessment of the instrumental relation between proposed governance approaches and stated objectives also requires clarifica-

tion of the values to be pursued. A proliferating literature has begun to examine alternative instruments, but an integrative analysis of how they relate to political and economic goals is largely lacking. In the following sections we discuss the value and instrumental dimensions in more detail.

NORMATIVE FOUNDATIONS OF NET NEUTRALITY

Addressing the challenges raised in the net neutrality debate requires first a clarification of the overarching values that should govern the Internet. Many of these values took shape during the formative years of the Internet. They emerged from repeated interactions and pragmatic choices of the computer scientists, software designers, engineers, and users involved in the development of the Internet. In the process of designing the Internet's engineering architecture, they also, implicitly and explicitly, developed a set of governing principles. At a high level, open access and freedom from government control and censorship are widely shared visions in the Internet community (Braman 2011). This is poignantly expressed in statements by central participants to the discussion, such as David Clark's remark to an IETF conference that "We reject kings, presidents and voting. We believe in rough consensus and running code" (Clark 1992). Others, such as the linking of Internet access and use with human rights, are an outcome of more recent developments. This subsection focuses on the normative aspects of the net neutrality debate through the lens of reflections in the research community.

It is important to bring these normative dimensions into open deliberation so that they do not influence the discussion as unexamined tacit premises (or crypto-factual statements). Contributors to the net neutrality debate draw from several, sometimes incommensurable, normative traditions. Discussions among legal experts, communication scholars, and political scientists emphasize human rights, political freedoms, and creative freedoms as important rationales for policies in support of an open Internet. Economists and engineers tend to start from efficiency considerations, with some overlap with respect to innovation arguments. Tensions between these positions are rooted in their very different epistemological foundations and the resulting ability to construct normative arguments. Philosophy and jurisprudence provide frameworks to assess implications of institutional and governance arrangements for justice, equity, and fairness. Economics and engineering, when employed in a normative mode, focus on efficiency. The second theorem of welfare economics implies that efficient outcomes can be achieved from different initial endowments of resources (Arrow 1951). From this perspective, the themes articulated in the broader political and human rights debates are critical in defining

these “endowments” (rights and obligations) and therefore precede governance choices designed to enhance efficiency. The remainder of the section distinguishes three interrelated clusters of arguments: (1) human and political rights, (2) creativity and innovation, and (3) efficiency.

Human and Political Rights

Visions of the economic, social, and political benefits of communication technologies have inspired engineers, scholars, and activists since the early days of electronic communications (Flichy 1995; Mansell 2012; Standage 1998). Flichy (2007) argues that they are an integral and indispensable part of the technological innovation process. In a broader historical perspective, the Internet is but the latest and most powerful “technology of freedom” (Sola Pool 1983), with potentially far-reaching effects on human and political rights (e.g., Brophy and Halpin 1999; Hick, Halpin, and Hoskins 2000; Warf and Grimes 1997). Many of the features that support this potential are related to design conventions that were adopted during the early decades of Internet development, such as the treatment of information as bit streams and openness to heterogeneous devices (Braman 2011).

These design conventions are seen as crucial safeguards for freedom of expression as well as the freedom to access information and their political repercussions. Freedom of speech online requires the ability for users to access the Internet and to communicate their thoughts and viewpoints online. Nunziato (2009, xiii) emphasizes that “the Internet provides the greatest forum for communication and expression that the world has ever seen.” Scholars steeped in different traditions stress the opportunities offered by the Internet to contribute to the realization of important goals of democracy and justice. One strand of arguments builds on Habermas’s notion of a public sphere, seen as “an intermediary system between state and society” (Habermas 2006, 412) that is a crucial component of the institutional fabric of modern democracy. The Internet can help rejuvenate a public sphere, although several authors also point to potential risks, such as a fragmentation of political discourse (Bohman 2004; Calhoun 1992; Cavanagh 2007; Hall 2008; Sunstein 2009). Net neutrality is seen to protect this important function of the Internet.

Another set of rationales builds on the framework developed by Rawls (1971) in his *Theory of Justice*. Focusing on institutional arrangements that leave the weakest members of society better off than in alternative settings, it provides normative bedrock to establish a governance framework for the Internet. A key conclusion might be that access to means of communications should be made available to the broadest number of individuals possible. Using this approach Schejter and Yemini (2007) point to important differences between access to traditional media

and the potential for access via the Internet. Whereas access to radio and television was historically regulated due to scarcity of electromagnetic spectrum, the Internet is a technology of abundance, providing novel opportunities for innovators, consumers, and individuals to have their voices heard. This requires novel regulatory approaches, as “the promise of the Internet does not lie in its support of large businesses, but in the opportunities it provides for those who could not have had a say in technologies of content scarcity” (Schejter and Yemini 2007, 171). “Network neutrality is about creating a potential voice for the many over the first true technology of abundance: broadband Internet” (Schejter and Yemini 2007, 171–173).

In the American context, many scholars link the Internet back to the constitutional protection of the freedom of speech as expressed in the First Amendment. Blevins and Barrow (2009, 46–47) argue “that the Internet has such unique qualities and a momentous democratic nature that it merits its own First Amendment framework informed by participatory-democratic theory.” Because the Internet “is the most participatory form of mass speech yet developed” it deserves the highest protection from “any instruction, government or private.” Furthermore, the authors note that “the human speech rights of Internet users should outweigh the property rights of ISPs.” Travis (2007) argues that traditional conceptions and objectives of free speech, as manifested in North America and Britain when the U.S. Constitution was amended in 1791, offer a more solid ground to protect the opportunities provided by the Internet. “By hearkening back to the common law and articulating originalist principles of constitutional, intellectual property, and antitrust law, Internet freedom can be founded upon a surer footing than the ad hoc balancing that characterizes contemporary cyberlaw scholarship and judicial decisions” (Travis 2007, 1579–80).

Cooper connects this discussion with the civic discourse and the benefits that an open Internet can provide to a democracy in that “the result (of a closed Internet) in the polity will be to confer excessive influence to platform owners and, more importantly, undermine an opportunity to enrich civic discourse through more active involvement of the citizenry” (Cooper 2003, 180). Likewise, Lessig (1999, 166–67) points to the many linkages between openness and normative democratic values such as free speech, emphasizing how “relative anonymity, decentralized distribution, multiple points of access, no necessary tie to geography, no simple system to identify content, tools of encryption,—all these features and consequences of the Internet protocol make it difficult to control speech in cyberspace. The architecture of cyberspace is the real protector of speech there; it is the real ‘First Amendment in cyberspace.’” However, these views are not universally shared. Several scholars and advocates point out that American constitutional law provides strong protections

for corporate speech rights, which would be curtailed by net neutrality provisions (see Corn-Revere 2009; Jerome 2009; Sidak 2006).¹⁴

With the broad diffusion of the Internet and its growing importance for all aspects of life, rights to access and use are increasingly discussed as a dimension of human rights (Hamelink 2000). Human rights aspects were articulated in the Working Group on Internet Governance (WGIG), the World Summit on the Information Society (WSIS), and are part of the ongoing deliberations of the Internet Governance Forum (IGF).¹⁵ In September 2010, the Council of Europe adopted a declaration in which human rights aspects—among others, the freedom of expression and information, right to respect for private life and correspondence, and the right to freedom of thought—are seen as important guidelines in shaping a governance regime for the Internet (Council of Europe 2010). In July 2012, the U.N. Human Rights Council adopted a nonbinding resolution declaring that people have a right to freedom of expression on the Internet, thus extending human rights to cyberspace.¹⁶ Although these discussions are at an early stage, they suggest that the voluntary design principles governing an open Internet may eventually be augmented with other, possibly more formal instruments.

Creativity and Innovation

A second strand of the normative discussion is rooted in a sociotechnical analysis of the architecture and associated performance of the Internet. Before the term “net neutrality” became a focus of the debate over the future of the Internet, a similar discussion took place regarding the maintenance of an “open” Internet, going back to Saltzer, Clark, and Reed’s (1984; 1981) notion of an “end-to-end” network design. In this architecture, applications and services that are not used by all participants are located at upper layers (often also referred to as the “edges” of the network). This modular design in combination with the function of the IP protocol as a “portability layer” (Van Schewick 2010) provides for a rather flexible technical architecture in which innovations in the upper layers can build on a standardized, transparent platform. As innovators do not have to incur the transaction and adaptation costs associated with integrated innovations that would require changes in the network layers to accommodate innovations in services and applications, the space of economically feasible innovation opportunities is expanded.

Blumenthal and Clark (2001) compared the potential of a closed Internet to a “Brave New World” and suggested that the rise of a new cohort of Internet stakeholders and evolving user and governmental needs and interests was, at the turn of the new millennium, threatening the future of the Internet’s flexibility, generality, and openness. Noting

that the open Internet has led to “the introduction of new applications, thus fostering innovation, with the social and economic benefits that follow,” they are concerned that “efforts to put more functions inside the network jeopardize that generality and flexibility as well as historic patterns of innovation” (Blumenthal and Clark 2001, 97).

Concerned about the possibility that network operators might charge termination fees from content providers, Lee and Wu provide an additional argument in favor of a neutral Internet. “Given that the returns to content production are skewed and the expected value of a new online venture is low, sufficiently low costs of entry may have been and may continue to be crucial” (Lee and Wu 2009, 67). This is related to the recurring claim that a neutral Internet allows “permission-free” innovation by numerous content and application providers, thus multiplying innovation opportunities and the likelihood that a sustainable, successful product or service is discovered (Frischmann 2012; Lee and Wu 2009; Van Schewick 2010). Similar points are echoed in the management literature that points to the pervasive spillovers in a digital innovation environment that are facilitated by an open design (Brynjolfsson and McAfee 2011; Greenstein 2007; Hogendorn 2012). This model is often contrasted with traditional telecommunication networks where much of the “intelligence” resided in centralized computers and switches that modify information and add value within the network (Frieden 2002; Mansell 1993). In such an integrated architecture, innovations in upper layers may require changes throughout the entire network. These transaction and adaptation costs will, other things being equal, reduce the number of innovation experiments in upper layers and possibly slow down the rate of innovation.

Modularity and openness are, furthermore, associated with broader benefits related to social and political innovation. Lemley and Lessig express that sentiment, stating that “While the e2e design principle was first adopted for technical reasons, it has important social and competitive features as well.” These include an expansion of competition by maximizing “the number of entities that can compete for the use and applications of the network” (Lemley and Lessig 2001, 931), the prevention of strategic abuse of control over the network to tilt the competitive playing field, and safeguards for innovators “that they will not confront strategic network behavior” (Lemley and Lessig 2000, 7). Other authors have stressed the benefits of openness to user-driven innovation and creation (Hippel 2005; Hundt and Levin 2012) and changes in the mode of production. Benkler (2006; 2011) provides a penetrating analysis of new forms of peer and social production facilitated by the open collaborative Internet platform. All these authors raise concerns that closed network environments would jeopardize these important social innovations.

Efficiency and Protection of Property Rights

Two additional normative perspectives are brought to the debate by libertarian economists, legal scholars, and some computer scientists: concerns about the efficiency of Internet operations and the protection of the property rights of network operators against takings by government. Efficiency concerns are of broad interest, but the second aspect is more specific to the U.S. legal framework. Nonetheless, because similar lines of argument have surfaced in debates outside the United States, it shall briefly be reviewed. Calls for finding the most efficient governance arrangement for the Internet are to be taken very seriously. Economists use several metrics to assess how efficient a state or an arrangement is. If technology is stable, the notion of static efficiency is appropriate, which requires that a resource such as bandwidth is used in ways that equate its incremental costs to its incremental benefits. Thus, in cases of scarcity, uses with a high incremental valuation should be given priority over uses with lower incremental valuation. (If capacity is not constrained, its incremental cost is zero and all demand ought to be served.)

Given the high technological dynamics of the Internet, such a static notion of efficiency is less interesting than dynamic efficiency, which takes innovation and technical change into account. It is more difficult to define dynamic efficiency in an operational way, as innovation is inherently a disequilibrium process that cannot easily be captured by an optimality rule. There is broad agreement that dynamic efficiency requires market and governance conditions that facilitate risk taking, the temporary appropriation of rewards by innovators to compensate for the additional risk, and technological and market opportunities. In the advanced Internet, these conditions differ greatly for network layers, where high investment is required to upgrade to the next generation of advanced technologies, and the application and services layer where software-driven innovations can take place with more limited capital investment (Van Schewick 2010). Any governance regime for the Internet also shapes the level and patterns of investment by different players in the ICT system, but it potentially does so in differential ways (Bauer and Shim 2012).

Engineers generally also endorse efficiency as a key principle that should inform networking, but they are used to examining and managing trade-offs. In early contributions reflecting on the technical solutions to internet-working, computer scientists were aware of the fact that the specific architecture of the Internet was not the most efficient one but it was considered workable and robust (Odlyzko 2002; 2009). During the 1990s, the Internet experienced a first capacity bottleneck. Computer scientists and economists proposed pricing mechanisms to achieve efficient short-term capacity utilization and long-term ca-

capacity expansion (e.g., MacKie-Mason and Varian 1995). The migration to broadband technology alleviated many of the concerns and the discussion receded. With the growth of information-rich applications and services, traffic volumes and heterogeneity are once again increasing rapidly so that the question of efficiency is regaining importance. In the current networking environment, efficiency often can only be achieved by inspecting the type and origin of information, for example, by using deep packet inspection (DPI). Other technological solutions are being explored, but in any case differentiation is seen as an important tool to manage network capacity and to manage heterogeneous traffic flows (Jordan 2009; 2010; Jordan and Ghosh 2009; Trossen, Sarela, and Sollins 2010).

Another argument in favor of differentiation is derived from concerns about the scope of property rights of ISPs and their relation to efficiency. Sidak (2006, 373) argues from a law and economics perspective when noting that “the cost and demand characteristics of the telecommunications industry, along with fundamental principles of welfare economics and the common law, imply at least six rights that the owner of a broadband network may be recognized to possess.” These rights are: (1) the right to innovate on your own network, (2) the right to unilaterally price network use as long as it does not violate antitrust principles, (3) the right not to carry content and applications that present a risk to the network, (4) the right to prioritize data packets, (5) the right to reserve capacity on one’s own network, and (6) the right to use network capacity to vertically integrate into the provisions of content or applications. Protection of these rights is, in Sidak’s analysis, a precondition for efficiency and innovation in the Internet economy (Sidak 2006). The associated differentiation enhances rather than diminishes welfare.

INSTRUMENTS AND OBJECTIVES OF THE NET NEUTRALITY DEBATE

An instrumental rationality approach seeks to design governance arrangements that allow meeting the envisioned objectives. This requires a good understanding of the working of the system to be governed and the effects of alternative strategies, ranging from laissez-faire to stringent forms of intervention, on performance and objectives. It also necessitates an examination of possible trade-offs between political and economic goals and if both cannot be achieved simultaneously, a prioritization. The normative discourse reflected in the previous section shows an interesting asymmetry. Discussions focusing on the political tenets often juxtapose net neutrality with desired political and economic outcomes but the specific causal relations are not scrutinized in detail. In contrast, papers focusing on economic aspects examine the effects of different

instruments on economic performance explicitly but do not pay much attention to political goals. This section seeks to bridge this bifurcation.

We examine the connections between policy instruments and both political and economic outcomes based on a review of contributions to the net neutrality debate. We compiled an inclusive list of books and articles to identify main strands of reasoning as to how specific governance approaches relate to outcomes. Some of the surveyed papers and books provided an explicit discussion of the causal links between governance and objectives. If such an examination was absent we extracted the causal relations implied in the arguments by examining the logical relation between independent and dependent variables. Given space constraints, our analysis in this article focuses on six specific instruments that are discussed as alternative forms to safeguard an open Internet: (1) strict neutrality, (2) the prohibition of blocking (of content, applications, and devices), (3) prohibition of a termination charge of network operators vis-à-vis content and application providers (sometimes referred to as a zero price constraint), (4) quality of service tiering without discrimination between content providers, (5) quality of service tiering with an obligation to provide a minimum quality service tier, and (6) quality of service tiering with discrimination, constrained only by provisions of antitrust law. These instruments can be used separately or in combination.

In political practice, goals and instruments are typically discussed and selected simultaneously. Separating them is therefore an analytical simplification. Given the complexity of the ICT system, assessing the relations between specific governance arrangements and system performance is not an easy task. An important distinction is whether an instrument is necessary or sufficient for an outcome (e.g., Ragin 2000). Necessity implies that an instrument is utilized whenever an outcome is observed, but other factors also need to be present to generate the outcome. Sufficiency is a stronger condition and implies that whenever an instrument is in place the outcome results. For policymakers, finding necessary and sufficient conditions is critical. If sufficient conditions can be found, policy implementation is relatively straightforward. In complex sociotechnical systems, because of the multiple feedbacks and dynamic relations, sufficient instruments for a specific outcome may not exist or not be known. For one, several factors jointly may constitute a sufficient or a necessary condition. In this case, policymakers would have to control all the relevant conditions simultaneously. Moreover, the necessity or sufficiency of factors is contingent on the overall state of the system. For example, a zero price rule may support investment under certain constellations of consumer demand and network costs but not under others. Lastly, it is possible that instruments are not logically related to outcomes but nonetheless are per-

ceived as legitimate and desirable features of a governance regime.

Strict net neutrality is seen by many scholars and advocates as a critical precondition of widely shared political goals (Blevins and Barrow 2009; Cooper 2003; Lemley and Lessig 2001; Meinrath and Pickard 2008; Nunziato 2009).¹⁷ Indeed, strict neutrality would provide strong protection of speech rights of many stakeholders, particularly users and content providers. Because it reduces transaction and adaptation costs for innovators, it would also enhance the scope of feasible innovation projects at the application and services layer. To a certain degree, the weight and feasibility of free speech arguments in defense of strict neutrality is contingent on prevailing constitutional law, which differs across regions. In the United States, the First Amendment addresses relations between government and individual and corporate persons. With few exceptions, such as common carriers, which are not deemed “speakers,” it does not prevent private corporations from regulating speech on their networks, although constitutional law has developed balancing tests to weigh the rights of users against the rights of owners.¹⁸ In much of Europe, in contrast, constitutional free speech provisions also govern relations between corporations and users; hence, the imposition of neutrality regulations would be easier.¹⁹

However, free speech rights of users may have to be weighed against constraints on the speech rights and economic incentives of ISPs (and possibly other stakeholders to whom neutrality principles might be expanded). Neither constitutional law nor jurisprudence provides an undisputed standard for weighing these rights. Thus, the spectrum of legal views and analyses is broad, ranging from endorsement of strict neutrality to positions that consider a differentiated and diverse Internet as most compatible with balancing the free speech rights of all stakeholders (e.g., Sluijs 2012; Yoo 2005; 2012). Even scholars who principally support neutrality because of its benefits for free speech and innovation concede that some forms of differentiation are meaningful in specific situations, although possibly under the watchful eye of the public. Wu (2004, 235) notes, “Operators should have the freedom to ‘police what they own,’ or act reasonably to control the local broadband network. On the other hand, . . . the Internet community (and, at some point, regulators) should view with suspicion restrictions premised on inter-network criteria.”

With regard to economic goals, scholars who see openness and neutrality as instrumental for innovation frequently imply that it facilitates network infrastructure innovation. The argument sometimes rests on a presumption that additional investment is the cheapest way to cope with network congestion, but the specific details of this assertion remain unexamined (Odlyzko, Arnaud, Stallman, and Weinberg 2012). More detailed economic analyses do not

generally support this claim. Although a few papers conclude that strict neutrality might stimulate network investment under certain conditions (e.g., Choi and Kim 2010), the more frequent finding is that it would constitute a disincentive for short-term efficiency as well as longer-term investment and network innovation (for a detailed discussion see Krämer et al. 2012).

A somewhat less restrictive approach is to secure network openness via access rights. Several variants to specific rights are possible. In voice communications, user rights of access have long been expressed in national law and international treaties (although the implementation often fell short of the stated objectives). In the Internet environment, such rights are facilitated by the open design conventions and more recently by other policy decisions. A specific implementation is to prevent ISPs from blocking users and providers of content and applications, although this could be construed in a narrower fashion than general access rights. A no blocking provision offers a strong safeguard of free speech rights. It also provides a clear-cut protection against sabotage of competitors. If combined with the freedom to differentiate, the potential negative impact of such a rule on investment and innovation is likely to be minimal. At the same time, the rule will have to have boundaries, as there are instances, such as illegal activities or malware, where blocking may be a legitimate response.

The potential downsides of strict net neutrality on investment and innovation incentives of network operators might be mitigated if quality of service differentiation were allowed. Such differentiation can affect the relations between players on the supply side (e.g., network operators offering quality of service tiers to content providers) or on the demand side (e.g., network operators offering different speed tiers to users). Differentiation is seen with considerable skepticism by many scholars and advocates motivated by the radical potential of the Internet to support free and open speech. Particular ire is directed toward termination charges that network operators might charge from content providers and toward subscriber plans with capacity limits (e.g., Odlyzko et al. 2012). Differentiation of quality of service tiers for wholesale customers and of different speed tiers for users (without capacity limits) is seen as less problematic. This opposition is often rooted in a perceived conflict between free speech and openness goals and such business practices, rather than in rigorous economic analysis of the potential effects of differentiation.

This gap is filled by a growing economic literature on the effects of quality of service differentiation on short-term and long-term efficiency. The stronger reliance of the majority of contributions on formal models facilitates an explicit examination of the performance implications of specific instruments. The six papers synthesized in

Table 2 (Cheng, Bandyopadhyay, and Guo 2011; Choi and Kim 2010; Economides and Hermalin 2012; Hermalin and Katz 2007; Krämer and Wiewiorra 2012; Shrimali 2008) can be seen as representative of this growing body of research. Given space constraints, it is only possible to highlight key findings but they are consistent with the more detailed discussion in recent surveys (see the surveys by Schuett [2010] and Krämer et al. [2012]). Researchers typically proceed in a comparative fashion: Starting from a baseline scenario (typically a zero price rule or strict net neutrality), the effects of alternative governance mechanisms on short-term and long-term outcomes are studied analytically. Differentiation of quality of service tiers is most widely examined with fewer contributions looking at minimum quality standards (Brennan 2011).

Analytical approaches need to simplify to reduce the complexity of real-world relations to tractable problem statements. Therefore, models are to some degree sensitive to the specific abstractions used. Nonetheless, they offer a valuable lens for assessing the relations among players in the Internet system and outcomes of alternative arrangements. Models employed by researchers in this field differ in their assumptions regarding the allocation of network capacity, the structure of network and content/application provider markets, and whether they examine investment and innovation decisions explicitly. Three of the six papers summarized in Table 2 use M/M/1 queuing models (an elementary queuing process that has closed form solutions and therefore lends itself to be analyzed analytically) to address the allocation of network capacity. Only one paper considers competitive ISPs, whereas five papers assume that network provision is a monopoly. Half of the papers model competition in content and application markets.

The majority of the papers explore the effects of different regulatory regimes on short-term resource allocation and long-term decisions. Outcomes are, to a certain degree, contingent on the specific model assumptions. This is particularly true for short-term effects, where authors find that, under certain conditions, net neutrality can be welfare enhancing (Economides and Hermalin 2012) or welfare reducing (e.g., Krämer et al. 2012). Findings are more consistent with regard to investment and innovation implications. A recurrent finding is that network differentiation facilitates innovation and investment. With the exception of Shrimali (2008), all other authors find that this outcome is likely but nonetheless contingent on specific conditions. For example, Choi and Kim (2010, 466) conclude that “the relationship between net neutrality regulation and investment incentives is subtle.” Although the authors cannot derive general conclusions, they identify some conditions under which strict net neutrality increases the incentive of network operators to invest, not least because the chilling effect of discrimination on content providers is reduced.

TABLE 2
Recent research on the effects of net neutrality instruments

	Hermalin & Katz (2007)	Shrimali (2008)	Choi and Kim (2010)	Cheng, Bandyopadhyay, and Guo (2011)	Economides and Hermalin (2012)	Krämer and Wiewiorra (2012)
Vertical regulation regimes	Zero price versus quality of service tiering (QoS-T)	Zero price versus price differentiation for network services	Zero price versus quality of service tiering (QoS-T)	Zero price versus quality of service tiering (QoS-T)	Zero price versus quality of service tiering (QoS-T)	Zero price versus quality of service tiering (QoS-T)
Allocation of network capacity	Independent	Independent	M/M/1 queueing	M/M/1 queueing	ISPs allowed to subdivide bandwidth and sell priority service	M/M/1 queueing
ISP market structure	Competition	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Content provider market structure	Monopoly	Monopoly or duopoly	Competition	Competition	Monopoly	Competition
Investment by ISPs	No	Yes	Yes	Yes	Yes	Yes
Innovation by content providers	Yes	Yes	No	No	Yes	Yes
Main findings	Restricting a platform to a single product constrains application providers seeking lower and higher than average quality platform services; allows those in middle to use higher quality; likely negative welfare effects	Zero price rule maximizes social surplus in the short-run; in the long run, ability of network operators to price differentiate facilitates innovation	It cannot be excluded that zero price rule results in higher network investment	In the short run, network operators gain, and content providers lose, if QoS-T is permitted. Incentives for ISPs to expand network capacity are generally higher if QoS-T is prohibited (i.e., zero prices rule is enforced)	In the short-run, network neutrality superior to subdivision but investment incentives are highest if price discrimination is permitted. Net effect a priori unclear	In the short-run, QoS-T is welfare superior if the same number of content providers (CPs) are active; QoS-T creates stronger incentives for broadband investment if and only if competition between CPs for ad revenue is not too strong

Economists have long pointed out that the complementarity between network access services, applications, and content mitigates or even eliminates incentives of network operators to discriminate against players in these upper layers.²⁰ Nonetheless, there are exceptions to the general

rule (Farrell and Weiser 2003; Van Schewick 2010) that might require safeguards. One possible set of safeguards is the requirement to offer a minimum quality of service tier on a nondiscriminatory basis (Brennan 2011). Such a solution is simple and easy to devise, although the specific

level of service quality may be contested. It would protect free speech objectives while allowing differentiation that supports investment and innovation. A second approach is to rely entirely on antitrust enforcement. This is appealing in an environment of rapid change as it allows an evolutionary learning process (Candeub and McCartney 2010). At the same time, antitrust uses a discovery procedure that may be cumbersome and ineffective. Ex post regulation, that is, regulatory interventions contingent on certain types of abuse, might be a workable and more efficient approach (Yoo 2012).

ANALYSIS AND DISCUSSION

The next step in our analysis is an assessment of the causality relations between the instruments and major goals, especially the direction of an effect (positive, negative, neutral, or unknown) (see Table 3). An interesting pattern emerges: None of the six instruments is capable of contributing positively across the range of accepted goals. Two instruments—strict neutrality regulation and quality of service tiering without nondiscrimination safeguards—affect economic and political goals in both positive and negative ways, suggesting there are trade-offs. Based on our current state of knowledge, strict neutrality regulation most likely would have positive effects on political goals but affect economic goals negatively, as it eliminates some of the market mechanisms that enhance efficient network operation. The opposite is the case with quality of service tiering without nondiscrimination constraints, which has positive effects on economic efficiency but potentially negative effects on important political goals. All other instruments have positive effects on either economic or political goals but do not suffer from negative effects on the complementary set of goals.

Prohibition of blocking²¹ will go a long way in safeguarding the freedom of speech and preserving opportunities to participation in civic life. If reasonably bound to allow blocking of, for example, malicious traffic, it does not seem to have strong effects on the efficiency of network capacity allocation because other means, such as pricing, are not precluded by the rule. While blocking slightly reduces the options available to network operators to address extreme forms of congestion, it does not eliminate congestion management tools altogether. A prohibition of blocking therefore may increase the incentives of network operators to expand capacity to avoid congestion and its negative effects on reputation but without an obligation to serve this effect will likely be small. Furthermore, it may enhance the incentives of content and application providers to innovate. The magnitude of this effect is difficult to gauge. Since network operators have an interest in diverse content and complementary innovation in content and applications that enhances the value of

network access, the effect may be small. At the same time, blocking may be instrumental to achieve goals such as information security. Thus, limited exceptions, intended to allow blocking for security and other reasons that do not constrain speech, will likely have to be permitted.

A zero-price constraint on network operators prohibits them from charging content and application providers for the termination of traffic at users (network operators already charge many content providers for access to the network and hosting). Thus, it takes away one instrument to manage network capacity on the downstream side of the market. It also eliminates a means to provide quality-of-service guarantees for applications that are sensitive to congestion. Under most circumstances, prohibiting such charges will reduce the incentives of network operators to invest in network upgrades compared to a situation in which price differentiation is allowed. However, as Choi and Kim (2010) show, if the network operator holds a monopoly position, it might, under certain market conditions, actually increase the incentives of network operators. At the same time, a zero price constraint most likely facilitates innovation at the services and application layer, as it reduces the direct costs of gaining access to a network for players at the application and services layer. This will expand the range of economically feasible services and applications (Bauer 2011; Prieger and Heil 2008; Reggiani and Valletti 2011). In as far as such lower costs increase the diversity of content and applications, they also might support freedom of speech and democratic ideals. Thus, across the range of goals, a zero price constraint shows a mix of positive, negative, and neutral sores.

One of the concerns with allowing differentiation of the network platform is that applications and services whose backers do not have the funds to pay for priority lanes on the network will be relegated to slow best-effort lanes. The incentives of network operators in this case are mixed. They do have incentives to allow access to content if there is demand among their customers. However, small political interest groups or themes that are highly specialized may not have sufficient economic weight from an operator's view and hence suffer from the slow-lane problem, even if a no blocking condition is introduced. Brennan (2011) therefore suggested a minimum quality approach, where a regulatory agency would set a minimum service quality that needs to be provided to users and service providers. Similar to a zero price constraint, this approach would enhance the incentives for innovation at the application and services layer. Also, it would safeguard free speech and civic engagement. In and of itself such a regulation would not contribute to efficient capacity management or network investment. However, it can be combined with differentiation and thus achieve the benefits of network differentiation while safeguarding important other goals. One potential complication is defining such a

TABLE 3
Stylized relations between net neutrality instruments and overarching goals

Instrument	Political goals		Economic goals		
	Freedom of speech	Civic participation and democracy	Efficiency of network capacity allocation	Network investment, innovation incentives	Applications and services innovation
Strict neutrality	+	+	-	- (some limited exceptions possible)	+ (especially for modular innovations)
Prohibition of blocking	+	+	~	~	+ (especially for modular innovations)
Zero price constraint on network operator	+	+	~	~ (could be + under certain conditions)	+ (especially for modular innovations)
Minimum quality of service tier	+	+	~	~	+ (especially for modular innovations)
Quality of service tiering without discrimination	~	~	+	+	+ (especially for coupled innovations)
Quality of service tiering with discrimination	-	-	+	+	- for modular, + for coupled innovations

Note. ~, no strong relation; +, positive relation; -, negative relation.

minimum quality in a robust way, but precedents exist in telecommunications and in other network industries (e.g., Norsworthy and Tsai 1999). Like a zero price constraint, the option of requiring a minimal service quality tier has advantages and disadvantages.

Quality of service tiering with nondiscrimination conditions is another policy option that is widely considered. In its more stringent form, such a model would permit quality of service tiering but would oblige network operators to make any such tiers available to any requesting party. In other words, exclusive agreements between a network operator and a single application or service provider would be in conflict with this rule. Likewise, different treatment of corporate affiliates or services offered by such affiliates would violate it. In practice, such a rule could be specified as a “most-favored-nation” clause; conditions offered to one organization would need to be made available to other requesting parties, taking into account economic and technological criteria that might justify some form of differentiation (e.g., the volume of a contract). This would allow differentiation of service classes while avoiding sabotage and anticompetitive discrimination, which are relevant concerns with regard to services that compete with a

network operator’s own offerings (Beard, Kaserman, and Mayo 2001). At the same time, it would allow premium service providers and service providers with specific technical requirements to agree on specific quality of service tiers with network operators. In its more libertarian approach, the ability to discriminate would only be bounded by antitrust principles.

The vast majority of economic analyses conclude that both these options have desirable efficiency properties (Krämer et al. 2012). In most models, the ability to differentiate improves short-term capacity utilization and, other things being equal, long-term network investment. One concern is that this governance approach may diminish the incentives for certain types of modular applications and service investment that would benefit from an approach that keeps transaction and adaptation costs low (Bauer and Shim 2012; Van Schewick 2010). This is not inevitable, though. Due to the complementarity between network operation and applications, network operators are interested in a stream of innovations. They may set up incubator-like environments or grant startups free access during an experimental phase.²² Nonetheless, there is a potential tension between differentiation and the idea of

permission-free innovation. Moreover, there is a tension between differentiation on the one hand and free speech and other political goals on the other if it is combined with differential access of users to information. Either network operators or content providers may develop into gatekeepers. To avoid this development, quality of service tiering will have to be coupled with other instruments such as no blocking or minimum service quality provisions.

One last aspect deserves mentioning. Like other forms of innovation, service and application innovations come in many forms. Some forms, like mobile and Web apps, are largely modular, but others are coupled with innovations in other segments of the ICT system (for a more detailed discussion see Bauer and Shim 2012). From what we know, the effect of net neutrality instruments on these types of innovation is asymmetric. The first four instruments in Table 3 have beneficial impacts on modular innovations (but, other things being equal, weaken the incentives for coupled innovation), whereas the last two instruments of quality of service differentiation facilitate coupled innovations (but potentially have a dampening effect on modular innovations). One way to overcome this potential trade-off is to adopt a combination of measures.

CONCLUSIONS

Our analysis has critically examined the objectives articulated in the net neutrality debate and the specific policy instruments advocated by proponents and opponents of alternative governance approaches. Political and economic arguments are drawn from different normative foundations and advanced by different stakeholders as alternative visions for the governance of relationships between network operators and content and application providers. Although goals such as supporting the freedom of speech and efficiency are widely shared, they are often pitched against each other or claimed to be compatible without a careful examination of the causal relations. Reconciling them and formulating an integrative view is complicated by the disjunct and often contentious nature of the political and academic debates. Our approach sought to overcome these rifts. An examination of the relations between the most important proposed means and ends reveals that they are not necessarily in conflict. There is also no single instrument that appears capable of achieving both sets of goals simultaneously and in a reliable fashion. Of the six instruments discussed, some affect predominantly political goals and others predominantly economic goals. In other cases, such as strict neutrality, trade-offs exist between its positive effects on political goals and economic objectives. In the other cases discussed, such trade-offs may exist but are weak.

Furthermore, an analysis of the causal relations between the instruments and the goals of the net neutrality debate

shows that none of the instruments taken individually is sufficient to achieve the goals. Rather, these means are at best necessary conditions for political and economic goals. No blocking is a necessary condition for political goals and certain types of innovation. Taken by itself, a minimum quality service tier can alleviate concerns about the freedom of speech and access of content and application providers to users, but how it scores with regard to network capacity utilization and investment depends on the ways it is combined with other provisions. Forms of quality of service tiering are necessary conditions that allow ISPs to adopt better short-term capacity utilization methods and, with few exceptions, necessary conditions for network investment in a market environment. This suggests that in order to safeguard economic and political goals, several instruments might have to be combined. Several possible combinations of instruments exist. A combination of a no blocking rule with permission to differentiate the quality of service establishes necessary conditions for both political goals and economic efficiency objectives. Alternatively, a minimum service quality tier combined with a no blocking constraint and quality of service differentiation (beyond the minimum quality tier) allows meeting necessary conditions for all identified goals. This combination provides somewhat stronger protection for content and service providers but raises the additional regulatory headache of defining the minimum quality.

Contrary to the beliefs of many participants in the net neutrality debate, none of these instruments is sufficient to secure all envisioned goals. For example, using the Internet to support an active culture of civic participation will require a population with the interest, time, and energy to participate (e.g., Obar 2013). Likewise, a no blocking rule only secures the opportunity of free speech but does not mean that anybody will partake. Again, complementary measures by private and public actors will be required to affirmatively realize the goal. Similar concerns hold for the economic goals. For example, a no blocking rule provides a necessary safeguard for potential innovators but it does not guarantee that such innovation will take place. Likewise, allowing quality of service differentiation does not ensure investment in network infrastructure. For investment to occur, other conditions must be met: Firms will consider factors such as future revenue and cost developments, the cost of capital, the riskiness of an investment, and other options such as postponing an investment. The ability to differentiate is but one element in this calculus, and influencing the other factors will require different policy instruments.

The analysis presented in this article offers a way to reengage stakeholders across the divide that separates experts and advocates focusing on political and those primarily interested in economic concerns. The chosen analytical approach allows disentangling value and

instrumental rationality aspects and a more informed assessment of the specific policy proposals that are put forward. It also allows assessing existing net neutrality policies, particularly whether they implemented a combination of instruments that is capable of influencing the system in the desired direction. Although we discussed the principal instruments that are currently in discussion or in use, other approaches and instrument combinations are theoretically possible. Our framework allows subjecting them to a critical analysis with regard to their contribution to political and economic goals. Examining the direction of effects and of causality relations can help clarify the ability of single instruments and of combinations of instruments to achieve consented objectives. Its application may facilitate the finding and implementation of meaningful policies that safeguard the broad range of legitimate goals raised in the present debate.

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NOTES

1. Even though a precise definition is elusive, the term “open” typically refers to several aspects of the Internet’s architecture and operation. It includes (1) publicly available standards, (2) the treatment of information flows in roughly the same way, and (3) the ability of entrepreneurs to design new devices and services without having to seek permission from other stakeholders in the ICT ecosystem. See, for instance, Faulhaber and Farber (2010), Shah, Sicker, and Hatfield (2003), Clark (2007), Claffy and Clark (2013), and Van Schewick (2010). The terms “open” and “neutral” are often used interchangeably, but we interpret “neutral” as a subset of attributes relating predominantly to how traffic flows related to different users and uses are handled.

2. This is a more pressing issue in countries and regions that have imposed stringent obligations on network operators. For example, private firms and policymakers in the European Union (EU) are concerned about low levels of investment in advanced networks and reassessing the prevailing regulatory framework (Cave and Martin 2010). For a view from the European Commission, see “Enhancing the Broadband Investment Environment—Policy Statement by Vice President Kroes,” July 12, 2012, available at http://europa.eu/rapid/press-release_MEMO-12-554_en.htm

3. For a recent thought-provoking expression of these apprehensions see Crawford (2013).

4. The term “governance” is used very heterogeneously by scholars in different disciplines and even geographic regions. A fair number of researchers, including many in the Internet governance field, use the term to refer to nongovernment forms of coordination. Such a narrow

use is neither logically compelling nor reflecting the etymological roots of the word.

5. The United Nations Working Group on Internet Governance (WGIG) circumscribed Internet governance as “the development and application by governments, the private sector, and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the Internet” (WGIG 2005).

6. See also the special section on net neutrality in the *International Journal of Communication* (IJOC 2007).

7. See <http://www.savetheinternet.com/net-neutrality> (accessed August 4, 2012).

8. Again, see <http://www.savetheinternet.com/net-neutrality> (accessed August 4, 2012).

9. Strict neutrality could also be enforced with detailed regulation, although few, if any, stakeholders endorse this option. The specter of detailed regulation is regularly invoked by stakeholders opposed to any form of government involvement as an inevitable consequence of even more modest forms of safeguards (Bauer 2007). The U.S. Open Internet Order (FCC 2010) does not require strict neutrality but allows differentiation. However, the order’s managed services exemption is subject to considerable concern and criticism (e.g., Claffy and Clark 2013).

10. The order has been challenged in court by Verizon, one of the largest broadband Internet service providers (ISPs) in fixed and wireless markets, with a decision expected in 2013. In 2010, Comcast had won an appeal against a 2008 FCC order, adopted in response to Comcast’s selective throttling of Bit Torrent traffic that imposed nondiscrimination obligations on the company. The D.C. Circuit Court of Appeals argued that the FCC did not have the authority to impose such rules limiting traffic management practices (U.S. Court of Appeals 2010).

11. See “Netherlands joins Chile in Net Neutrality Victory,” *International Business Times (tech)*, accessed September 6, 2012, from <http://www.ibtimes.com/articles/169065/20110624/netherlands-joins-chile-in-net-neutrality-victory.htm>; and Canadian Radio-Television and Telecommunications Commission, “Telecom Regulatory Policy CRTC 2009–657,” <http://www.crtc.gc.ca/eng/archive/2009/2009-657.htm> (accessed September 15, 2013).

12. The European Commission encouraged national regulatory agencies in the member states to safeguard net neutrality (Marsden 2010; 2011). In May 2012, the Body of European Regulators for Electronic Communications (BEREC) released several reports addressing net neutrality; see http://berec.europa.eu/eng/document_register/subjectmatter/berec/download/0/24-berec-publishes-net-neutrality-findings-0.pdf

13. See ETNO paper “Contribution to WCIT: ITRs Proposal to Address New Internet Ecosystem,” available at <http://www.etno.eu/news/etno/2012/51>.

14. Verizon and Metro PCS filed an appeal against the FCC Open Internet Order of December 2010, in which, among other problems identified by the complainants, violations of the First and Fifth Amendments are asserted. See *Verizon, Appellant v. Federal Communications Commission, Appellee*, filed in the U.S. Court of Appeals for the District of Columbia, July 2, 2012.

15. Recent panels and workshop at the Internet Governance Forum addresses topics such as “Internet and Human Rights: Shared Values for Sound Policies” (organized by the Internet Society and the Association for Progressive Communications; see Liddicoat and Doria [2012]) and “A Plan for Rights-Respecting Telecoms.”

16. See Somini Sengupta, "U.N. Affirms Internet Freedom as a Basic Right," <http://bits.blogs.nytimes.com/2012/07/06/so-the-united-nations-affirms-internet-freedom-as-a-basic-right-now-what>

17. For example, the ACLU (2010, 5) notes that the First Amendment requires "that the government create strong policies against incursion by companies that are, at root, profit-seeking rather than civic-minded." Similarly, Cooper (2004, 96) argued that "allowing network owners to discriminate against communications, content, equipment or applications represents a dramatic change that would render the information environment much less conducive to innovation. The mere threat of discrimination dramatically affects incentives and imposes a burden on innovation today."

18. For example, the test developed in the *Turner I* and *Turner II* cases, which upheld must-carry rules for cable systems (e.g., Nuechterlein and Weiser 2007).

19. Furthermore, the E-Commerce Directive, part of the European telecommunications regulatory framework, establishes exemptions from liability for mere conduit, caching, and hosting operations, which are seen as additional safeguards for the equal treatment of data traffic. But see also the critique of Horten (2011) on recent amendments.

20. The argument here is largely economic. There are a few examples where network operators discriminated against content on political and strategic grounds, although all these cases were resolved relatively quickly after they became publicized (see Nunziato 2009).

21. In a best effort Internet, blocking is the only credible threat that ISPs have to extract payment from a content provider. However, if quality of service tiers exist, it will be possible to charge a positive price for access to higher tiers without blocking access to the Internet per se.

22. In the United States, large companies such as Verizon and AT&T have invested in such incubators.

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