Editorial

Wolfgang Briglauer*

Special Issue on “Recent Net Neutrality Policies in Europe and the US”

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This special issue presents five selected contributions from well-known scholars and policy experts to provide both academia and policy makers from the ICT sector with an overview of the economic impacts of recent net neutrality policy changes in the EU and the US. In both jurisdictions, fundamental policy shifts have been implemented in the last two decades with lengthy and controversial decision-making processes with strong political party affiliations on both sides of the Atlantic. This issue focuses on the history of net neutrality policy making in the EU and the US with a particular emphasis on the more recent 2015–2018 period during which major policy changes occurred: The European net neutrality legislation was enacted in 2015. Its aim is to “guarantee the continued functioning of the internet ecosystem as an engine of innovation” by imposing net neutrality policies that prohibit any discriminatory uses of network management practices (such as blocking or throttling of lawful content) by Internet access service providers. In 2015, the US regulatory authority (Federal Communications Commission, FCC) enacted its 2015 Open Internet Order, in which the agency imposed the heavy-handed approach of adopting the 1930s-era rules for regulating monopoly telephone companies on broadband services. According to the Open Internet Order, strict net neutrality rules prohibit blocking, throttling and paid prioritization. Similar to the reasoning in the EU, the Open Internet Order should enhance a virtuous circle where “innovations at the edges of the network enhance consumer demand, leading to expanded investments in broadband infrastructure that, in turn, spark new innovations at the edge.” In 2017, the Federal Communications Commission’s Restoring Internet Freedom Order reversed its 2015 decision. Since then the regulatory regime in the US differs fundamentally from the rather strict regulations imposed in the EU.

***Corresponding author: Wolfgang Briglauer**, ZEW – Leibniz Centre for European Economic Research, Digital Economy Research Department, 68034 Mannheim, Germany; and Vienna University of Economics and Business (WU), Research Institute for Regulatory Economics, Welthandelsplatz 1, 1020 Vienna, Austria, e-mail: wolfgang.briglauer@wu.ac.at

The net neutrality debate has been characterized by strong idealistic views and much less by economic reasoning and empirical evidence. The academic debate about net neutrality was launched by law professor Tim Wu who made a rhetorical case for strict internet regulations laying out some basic non-discrimination principles and is credited with coining the term “net neutrality.” In fact, these ideas pre-existed Wu’s work, such as David Isenberg’s “Stupid Network” and even the Carterfone Decision from 1968. In recent years, numerous theoretical contributions from economists have examined welfare related effects of “neutrality” or its lack and this work has been thoroughly surveyed by several authors in the meantime.

The main arguments of net neutrality proponents can be summarized as follows:

- (i) neutrality in terms of non-discriminatory best effort internet fosters content innovation (“innovation at the edges”),
- (ii) assures basic rights of consumers (Wu’s main argument), and
- (iii) broadband Internet access service providers would engage in anticompetitive behavior without net neutrality rules.

The main arguments of net neutrality opponents can be summarized as follows:

- (i) net neutrality rules distort innovation incentives and reduce investment incentives as network operators only have limited scope to monetize their infrastructure,
- (ii) net neutrality rules would imply mandatory product heterogeneity which is likely inefficient as it limits the dimensions of competition and in view of heterogeneous consumer groups, and
- (iii) net neutrality is inefficient in view of network capacity constraints which require traffic management, e.g. at peak times, in order to meet the quality requirements of particular services.

The empirical evidence, however, is generally still very scant and has only been partly used in recent decisions of regulatory authorities. This special issue therefore also aims to provide some first experiences since 2015 based on descriptive evidence and quantitative analysis.

Stocker and Knieps (“Network Neutrality Through the Lens of Network Economics”) set the stage for this special issue by providing an overview of network neutrality and corresponding regulations from a network economics perspective. They elucidate major trends in the evolution of the Internet ecosystem and describe how corresponding developments have affected not only industry structures but also hierarchies and revenue-sharing conventions. Based on explanations of the remaining capacity allocation problems with which broadband

access service providers are confronted, they outline how these can be addressed in an economically efficient, market-driven fashion. Through this lens, the authors introduce a market-driven understanding of network neutrality. Then, the authors provide an overview of network neutrality in the US and the EU. The origins are described, different dimensions of regulatory implementations are explained, and a brief overview of the respective regulatory histories in the different jurisdictions is provided. In their analysis, they critically appraise network neutrality regulations. The authors identify and explain challenges and misconceptions that are associated with what they refer to as “two-tiered traffic regulations” and explain their consequences in the form of economic inefficiencies that have both a static and a dynamic dimension. Eventually, they argue for a more adaptive and open understanding of a market-driven network neutrality.

The introductory article is followed by two complementary and US based contributions. *Mark Jamison* (“Net Neutrality Policies and Regulation in the US”) first provides a general overview of the history of US net neutrality policies, beginning in 1956 when the government first imposed an industry boundary between transmission of information on the one hand, and the creation and processing of information on the other, culminating in a 2017 reversal of the 2015 FCC decision. The author then reviews the relevant theoretical contributions from the peer-reviewed economic literature examining the impact of net neutrality rules on i) total welfare, ii) network investment and iii) content investment and variety of internet content. The author finds that although the impacts of net neutrality regulations depend on the conditions in the marketplace, most of the reviewed papers find that net neutrality rules imposed on infrastructure operators can lower economic efficiency. A notable exception is blocking customer access to content that customers find valuable. The author further concludes that ex-post regulations should generally be preferred when the welfare effect of an action depends upon circumstances, because the latter can change and vary across markets. In particular, when the answer to the question of the effects of ex-ante regulation is “it depends,” and the scenarios that give different answers are realistic, then the policy decision should be in favor of addressing problems ex-post when they occur. This is because ex-ante regulations would clearly do some harm and ex-post regulations, properly conducted, would do little harm.

The other US based contribution is from *George Ford* (“Net Neutrality, Investment, and Restoring Internet Freedom: A Survey”) who reviews the related empirical literature. The author argues that empirical evidence indicating negative investment effects of the regulation played a key role in the FCC’s recent Restoring Internet Freedom Order. In doing this, the author discusses all empirical contributions cited by the FCC in its decision in view of established principles of rigorous empirical analysis. Whereas the FCC considered eight empirical

contributions it basically only considered two of them as sufficiently reliable in determining causal effects of net neutrality regulations. These contributions are discussed in more detail. While counterfactual analysis is the standard approach in modern empirical analysis, the author argues that the Restoring Internet Freedom Order is the first of FCC orders to use the term “counterfactual” in an empirical context. Also, the Restoring Internet Freedom Order was in terms of analytical foundation much more thorough than the economic and empirical analysis undertaken by the FCC in its 2015 Order. According to the author, the FCC’s assessment of the available evidence on the investment effects of net neutrality regulation was reasonable even if incomplete. With net neutrality being a highly controversial and politically-charged issue, both in the US and abroad, a lack of robust evidence on its effects risks allowing policies to be entirely unhinged from economic reality, a situation that will almost certainly lead to inefficient outcomes.

Whereas a limited number of empirical studies using US data exist, there is hardly any evidence outside the US. The article by *Roslyn Layton* (“Net Neutrality and Mobile App Innovation in Denmark and Netherlands”) presents one of the very first quantitative approaches to assess the role of net neutrality policies using data from EU countries for the years 2010–2016. In particular, the author examines the impact of different net neutrality regulations in Denmark and Netherlands on mobile app innovations. Whereas wireline networks are different in terms of the last mile technology and network architecture, economic issues as regards net neutrality regulations are basically the same. Whereas Denmark adopted soft rules (self-regulation) in 2011, the Netherlands have promulgated hard rules (legislation) in 2012. At the same time both countries are similar in many market respects at the macroeconomic and socio-economic level. This provides an excellent basis for a comparative quantitative analysis in order to assess the effect of different net neutrality rules on innovation activity. The author finds significant statistical support that soft net neutrality rules adopted voluntarily could promote content innovation, whereas, hard rules adopted through legislation and regulation were not associated with greater mobile app development. This main finding not only holds for the comparison of the two countries Denmark and Netherlands, but also for a broader sample of countries from different regions of the world.

Whereas most of the economics literature including the aforementioned contributions to this special issue examine welfare and efficiency related effects of net neutrality policies, the final contribution of this special issue examines the effectiveness of net neutrality policies. *Ingo Vogelsang* (“Net Neutrality Regulation: Much Ado about Nothing?”) argues that net neutrality regulation is largely ineffective, in particular, when it comes to the prohibition of prioritization and other quality of service differentiations, and to a lesser extent, when it comes to

the zero price rule. In particular, net neutrality rules have become increasingly circumvented in recent years by content delivery networks, content provider owned networks, network slicing and mobile apps. Net neutrality regulation is effective only in preventing the blocking of specific content and in preventing the favoring of content owned by network providers and in preventing some price discriminations. The author further argues that circumvention of net neutrality rules can also be inefficient if it leads to more expensive bypass solutions in network integration and pricing. In view of these developments, the author concludes that given the potential inefficiencies associated with ineffective regulations it is important to limit the latter to those cases where they are likely to be effective and not harmful. This would mean that only the anti-blocking rule and the rule against favoring network operator owned content should remain in force. The no-priority/no quality of service differentiation rule, however, should be replaced by a rule disallowing discriminatory differentiation, i.e. forbidding prioritization that is not open to all content providers.

Summarizing, the existing peer-reviewed theoretical literature (as reviewed in this issue) shows that net neutrality is not unambiguously good; in contrast, only under specific market conditions could the policy be welfare enhancing. The related empirical literature (as reviewed in this issue) is very scant and points to negative effects of net neutrality regulations on network investment and innovation activities. One of the main economic findings in this special issue is that the presence or absence of net neutrality policy regulation makes either little difference for market outcomes, or certainly not enough positive impact on market outcomes to justify any strict, and arguably controversial, interventionist policies. The economic analysis indicates that net neutrality rules should be limited to prevent specific abusive behavior in an ex-ante framework, if ex-post legislation is deemed insufficient. In any case, there is no evidence of apparent market failure and hence no justification for imposing strict and broad net neutrality rules. So how do we proceed, in view of the economic analysis and the previous political debates? As one author noted “what happens next is likely to depend more on elections than on analysis.” This emphasizes the strong role of ideological premises and interest groups, but still, further research should sooner or later shape policy actions. In particular, the major policy shifts and opposite directions in EU and US legislation give rise for future empirical research on causal effects of strict, soft or no net neutrality regimes to truly inform future, hopefully more evidence based, policy decisions. Also, there exists no theoretical and empirical work on the effects of physical or virtual bypass on the effectiveness of net neutrality regulation. Finally, whereas most of the discussion on net neutrality is focused on wireline network infrastructures, the debate applies equally to mobile networks. In particular, the rollout of 5G mobile networks, that have to be built

anew, requires a new assessment of the alleged trade-off between network investment incentives and content innovation. Interestingly, the leading countries for the rollout of 5G networks are the US, China, and South Korea, all countries with either soft or no net neutrality rules, whereas Europe is lagging behind.

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