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Conference Paper

The Political Economy of Broadband Cost Recovery: South Korea, USA and EU

32nd European Conference of the International Telecommunications Society (ITS): "Realising the digital decade in the European Union – Easier said than done?", Madrid, Spain, 19th - 20th June 2023

Provided in Cooperation with:

International Telecommunications Society (ITS)

Suggested Citation: Layton, Roslyn; Potgieter, Petrus (2023) : The Political Economy of Broadband Cost Recovery: South Korea, USA and EU, 32nd European Conference of the International Telecommunications Society (ITS): "Realising the digital decade in the European Union – Easier said than done?", Madrid, Spain, 19th - 20th June 2023, International Telecommunications Society (ITS), Calgary

This Version is available at:

<https://hdl.handle.net/10419/277996>

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Accepted Title: Divergence in policy approaches and arguments: What European policymakers can learn about cost recovery efforts in USA

Preferred Title: The Political Economy of Broadband Cost Recovery: South Korea, USA and EU

By Roslyn Layton and Petrus Potgieter

June 2023

The United Nations in pursuit of global connectivity estimates a gap in broadband investment of \$2 trillion and the stalling of internet adoption for lack of access and affordability. To ensure broadband access and affordability for end users, policymakers now explore broadband cost recovery, a rational, linear process to account for and attribute network traffic and cost to its source and the associated augmentation of financing to ensure the economic sustainability of broadband networks. The political economy of the evolving cost recovery approaches in South Korea, the United States, and the European Union are compared for philosophy, shortfall, goal, policy instrument, and legislation. The categories of recovery solutions (market-based, regulatory, or technological) are described with associated policy instruments (market-based negotiation, contributions to universal service etc.). Broadband Cost recovery is pursued for more than the nominal need to address market shortfalls, but for social goals such as affordability, fundamental rights, and the legitimacy of the state itself.

As digitization and broadband-enabled technologies become increasingly integrated, the set of broadband regulatory policies is an important activity of government. Nations increasingly consider broadband cost recovery policy in light of their connectivity goals and attempt to optimize the business models of the digital economy to resolve shortfalls in broadband investment, adoption, and affordability. European regulatory policymaking is explored as something more than merely serving political interests but in delivering the larger goal of European Union legitimacy within the global sphere. European Union appears to increasingly call upon fundamental rights as justification for state intervention. This is contrasted with the US approach of pragmatism in technology policy, where the role of “rights” frequently vitiates regulation and state intervention. South Korea appears to maintain its approach of strengthening its long-standing framework to deliver global broadband technology leadership.

Introduction and Background

[The gap in broadband network investment and adoption](#)

Shortfalls in broadband investment and adoption have been documented at a global, national, and local levels by multiple sources. The 2021 report from the International Telecommunications Union and UNESCO suggests a global broadband network investment gap of USD \$428 billion-\$2 trillion and calls

for contributions from the largest online platforms.¹ Such efforts to remedy infrastructure shortfalls are underway in the South Korea,² USA,³ European Union,⁴ Caribbean,⁵ Brazil,⁶ India,⁷ and others. This is not a coincidence; many nations experience network investment shortfalls. This challenge reflects larger economic challenges following the Covid-19 pandemic in which nations engaged in massive public financial stimulus of their economies⁸ and now find coffers depleted for social spending.

The United Nations Digital Inclusion report observes that broadband enables people to access essential services for health care, employment, education, and other essential services.⁹ The Covid pandemic increased the urgency for universal broadband as people had to learn, work, and receive healthcare from home.¹⁰ More largely, the internet increasingly drives the economy and productivity and is becoming the key medium for the delivery of government services. Despite broadband being more important and necessary than ever, adoption efforts have stalled at 3.7 billion people, half of the world's population for lack of access and affordability.¹¹

In the USA, the Federal Communications Commission (FCC) reports that 17 percent of Americans in rural areas and 21 percent of Americans in tribal areas lack access under the current 25/3 Mbps broadband benchmark.¹² Some 20 million Americans lack access to high-speed broadband service, according to the

¹ Broadband Commission "21st Century Financing Models for Bridging Broadband Connectivity Gaps," *Broadband Commission* (blog), October 29, 2021, <https://broadbandcommission.org/publication/21st-century-financing-models/>.

² "[간담회] 망 이용대가 입법 논의 재점화를 위.. : 네이버블로그," June 12, 2023, <https://blog.naver.com/yye8361/223126781150>.

³ "Wicker, Luján, Young, Kelly Reintroduce Bill to Explore Collecting USF Contributions from Big Tech," U.S. Senator Roger Wicker, March 16, 2023, <https://www.wicker.senate.gov/2023/3/wicker-luj-n-young-kelly-reintroduce-bill-to-explore-collecting-usf-contributions-from-big-tech>.

⁴ <https://digital-strategy.ec.europa.eu/en/consultations/future-electronic-communications-sector-and-its-infrastructure>

⁵ Andy Bax, "Connecting the Caribbean's Unconnected," *Broadband Communities*, September 2021, <http://www.bbcmag.com/technology/connecting-the-caribbeans-unconnected>.

⁶ "SEI/ANATEL - 10020173 - Tomada de Subsídios," Anatel, March 28, 2023, https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?8-74Kn1tDR89f1Q7RjX8EYU46IzCFD26Q9Xx5QNDbqYiJNH7rwkhXeXo3WfvrhUb0PHMGw8p5aR24P0OIwCDUyM1xwmW482e3ugs0--XOxywVYs1nVv14z49I3MOGWZm.

⁷ "Indian Telecommunication Bill, 2022 | Department of Telecommunications | Ministry of Communication | Government of India," 2022, <https://dot.gov.in/relatedlinks/indian-telecommunication-bill-2022>.

⁸ "Closing the SDG Financing Gap in the COVID-19 Era" (OECD, n.d.), <https://www.oecd.org/dev/OECD-UNDP-Scoping-Note-Closing-SDG-Financing-Gap-COVID-19-era.pdf>.

⁹ "Digital Inclusion" (Roundtable of Digital Inclusion, n.d.), https://www.un.org/techenvoy/sites/www.un.org/techenvoy/files/general/Definition_Digital-Inclusion.pdf.

¹⁰ Whalley, Jason, Volker Stocker, and William Lehr, eds. "Beyond the Pandemic? Exploring the Impact of COVID-19 on Telecommunications and the Internet." (2023).

¹¹ "WSIS Forum 2023: Digital must be leveraged to put sustainable development back on track." ITU.com. March 13, 2023 <https://www.itu.int/hub/2023/03/wsis-forum-2023-digital-must-be-leveraged-to-put-sustainable-development-back-on-track/>

¹² "Fourteenth Broadband Deployment Report," FCC, January 19, 2021, <https://www.fcc.gov/reports-research/reports/broadband-progress-reports/fourteenth-broadband-deployment-report>.

Commission's 14th Broadband Deployment Report¹³ and further suggested by the FCC's Broadband Map¹⁴ notes underserved 8.3 million locations¹⁵. FCC Chairwoman Jessica Rosenworcel has suggested that additional investment and affordability efforts are necessary for successful advancement of broadband services.¹⁶ Moreover the ongoing operating costs of networks have emerged as a key policy issue.¹⁷

The European Commission's consultation on the *future of electronics communications networks and their infrastructures* notes¹⁸ an EUR €174 billion investment gap.¹⁹ To reach similar goals for the United Kingdom, the Digital Connectivity Forum estimates²⁰ a GBP £25 billion gap in investment.

While many of the unconnected are in emerging markets, developed countries also struggle with adoption, whether in rural and Tribal areas, disadvantaged communities, and with the elderly, those with disabilities, and other groups. And even for those who can access broadband, many struggle to pay for it. Economics would suggest that these problems would be solved through efficient pricing, but the persistent gaps in investment and adoption show that the status quo is not working. This is attributed to different factors in different countries. Suggested explanations for market and government failure include either mismatched policy choices or failure to evolve policy (e.g. policy optimized for streaming video entertainment, not essential social services²¹), inability for broadband providers to recover costs

¹³ *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 20-269, Fourteenth Broadband Deployment Report, 36 FCC Rcd 836, 857, Fig. 3b (2021) (reporting that 19.2 million Americans did not have access to both 25/3 Mbps fixed broadband as well as 10/3 Mbps mobile broadband).

¹⁴ "FCC National Broadband Map," FCC National Broadband Map, accessed June 16, 2023, <https://broadbandmap.fcc.gov>.

¹⁵ "National Broadband Map: It Keeps Getting Better," accessed June 16, 2023, <https://www.fcc.gov/national-broadband-map-it-keeps-getting-better>.

¹⁶ "Chairwoman Rosenworcel Proposes to Increase Minimum Broadband Speeds," FCC, July 15, 2022, <https://www.fcc.gov/document/chairwoman-rosenworcel-proposes-increase-minimum-broadband-speeds>.

¹⁷ Federal Communications Commission. "FCC Reports to Congress on Future of the Universal Service Fund." August 15, 2022. <https://www.fcc.gov/document/fcc-reports-congress-future-universal-service-fund>

¹⁸ "The Future of the Electronic Communications Sector and Its Infrastructure | Shaping Europe's Digital Future," February 23, 2023, <https://digital-strategy.ec.europa.eu/en/consultations/future-electronic-communications-sector-and-its-infrastructure>.

¹⁹ "The Future of the Electronic Communications Sector and Its Infrastructure | Shaping Europe's Digital Future."

²⁰ "THE INVESTMENT GAP TO FULL 5G ROLLOUT" (Frontier Economics, September 7, 2022), <https://www.connectivityuk.org/wp-content/uploads/2022/09/The-Investment-Gap-to-Full-5G-Rollout.pdf>.

²¹ Justin (Gus) Hurwitz & Roslyn Layton, *Debatable Premises in Telecom Policy*, 31 J. Marshall J. Info. Tech. & Privacy L. 453 (2015)

from streaming services,²² lack of affordability,²³ overly strict policy on consolidation,²⁴ misguided price regulation or other network regulation, unrealistic expectations by policymakers, and so on.

The bulk of broadband traffic today consists of streaming media content that is delivered by a small number of global firms. This streaming media content has massively enhanced the utility of broadband, and generally, people who stream enjoy the experience. Content providers have developed a myriad of ways to monetize the content, be it through advertising, paid content bundles, image quality, tolerating or (alternately) cracking down on password sharing etc. Broadband providers have only started to find ways to monetize the consumer demand for streaming media traffic and are constrained (in most markets) by long-standing pricing practices as well as by regulation.²⁵

Broadband access and content are industries with high sunk cost and low marginal cost. Network access providers, however, have higher ongoing costs. Markets are driven by consumer valuations, product differentiation and bundling. Simulations show it is very unlikely for simply repricing the network access in reaction to the introduction of the content product to be optimal for firms or for consumers.²⁶

Hence the question emerges to what degree should policy evolve to reach its stated goals and how should business models adapt given the changing economics. To date, content providers engage robustly to bundle and price their products competitively and compellingly. The consumers realize these benefits with a vast array of content and streaming providers. However, when it comes to broadband, it is plain vanilla. Consumers have the de facto or de juris choice of flat rate data packages based on speed tiers. The model essentially puts the full cost of broadband on the consumer, whereas other business models engage third parties so that the end user can access the service at a free or reduced price. Broadband providers are limited not only in their ability to offer broadband in consumer-centric bundles, but in their ability to recover costs from content providers, and hence address network investment shortfalls and where possible, lower costs to end users.

The UN report on 21st Century financing suggests that content providers need to be incorporated into broadband policy in a more systematic and realistic way. It notes an urgency to address the gap should nations want to achieve their connectivity goals; and there is a need to augment and expand financing and investment models for broadband.²⁷ These new approaches include broadening the base of

²² Layton, Roslyn and Potgieter, Petrus H., Rural Broadband and the Unrecovered Cost of Streaming Video Entertainment (June 11, 2021). ITS Gothenburg June 2021, Available at SSRN: <https://ssrn.com/abstract=3820644>

²³ John Horrigan, "Reimagining Lifeline: Universal Service, Affordability, and Connectivity," Benton Foundation, February 22, 2022, <https://www.benton.org/publications/reimagining-lifeline>.

²⁴ Potgieter, Petrus H. and Howell, Bronwyn, Cardinality Bundling Under Oligopoly – a Simulation Model (August 2, 2021). TPRC49: The 49th Research Conference on Communication, Information and Internet Policy, Available at SSRN: <https://ssrn.com/abstract=3897641> or <http://dx.doi.org/10.2139/ssrn.3897641>

²⁵ Howell, Bronwyn E. and Potgieter, Petrus H., The Profitability of Flat-Price Broadband with An Over-The-Top Subscription Content Product – Benefits from Cooperation (August 1, 2022). Available at SSRN: <https://ssrn.com/abstract=4179037> or <http://dx.doi.org/10.2139/ssrn.4179037>

²⁶ Howell, Bronwyn E. and Potgieter, Petrus H., Content and Access Bundling: Simulating Complex Scenarios (July 26, 2019). TPRC47: The 47th Research Conference on Communication, Information and Internet Policy 2019, Available at SSRN: <https://ssrn.com/abstract=3427022> or <http://dx.doi.org/10.2139/ssrn.3427022>

²⁷ "21st Century Financing Models for Bridging Broadband Connectivity Gaps."

contributors, ensuring that those which derive financial benefits from the network, also contribute financially, particularly to “connect the unconnected”; that the contributions should be sustainable and predictable; and that they should be managed efficiently and disbursed in a timely and prioritized manner.”²⁸ In other words, neither should consumers nor taxpayers bear the entire burden of the cost of broadband; enterprises should participate. Moreover, those with resources have a responsibility to help connect those who don’t.

However the economics of broadband present challenges to ensure universal access and affordability in the current set of policies and regulation. While everyone must have internet access for remote work, online education, telehealth, and egovernment. Theoretically these could be provisioned affordably and do necessarily require high amounts of data, though many applications require some next generation standards and speeds to work optimally. However, the de facto policy to facilitate flat rate subscriptions based on speed tiers is designed primarily to facilitate the transfer of video streaming entertainment, a service with its own use case and requirements. Essentially, 80 percent of global internet traffic is video streaming entertainment.²⁹ Optimizing the network for the subset of users who stream may be at odds with delivering the set of essentially services affordably and efficiently.

Broadband Cost Recovery and Methods

While the current debate is characterized by hashtags and buzz words like “fair share” and “mandatory fees”, a proper analysis of the situation requires a rational, linear process. Not all issues of shortfall require government intervention; indeed improved technology can achieve at least 30 percent efficient improvement across many networks. However, it is helpful to review the following steps to see where and how nations can improve their outcomes.

Hence broadband cost recovery is based on the following four elements.

1. **Accounting.** Documenting network traffic and cost and the process to recoup expense of building/running broadband network with accurate assessment and attribution.
2. **Access.** Defining the network requirements so that all can get access to healthcare, employment, education, and other essential social benefit services.
3. **Affordability.** Designing the policy to make broadband provision more equitable financially. Ensuring the freedom and flexibility to provide broadband offers which are relevant and tailored to subscribers’ needs, particularly for the disadvantaged.
4. **Augmentation.** Strengthening the access and affordability to broadband through business models which incorporate contributions from parties beyond end users.

²⁸ Ibid

²⁹ “Global Online Video Platforms Market Drives over 80% of Total Internet Traffic | Skyquest Technology,” GlobeNewswire News Room, February 8, 2022, <https://www.globenewswire.com/en/news-release/2022/08/02/2490661/0/en/Global-Online-Video-Platforms-Market-Drives-over-80-of-Total-Internet-Traffic-Skyquest-Technology.html>.

Three categories of cost recovery

There are three categories of cost recovery business models: market-based, regulated, and technological. Market-based models include negotiation and end user pricing. The following section will describe innovations in end user pricing. Negotiation today is rather limited. There are scant discussions of data exchange fees as most delivery occurs on a settlement free basis. However, this may not be optimal. The paucity of contracts could suggest inherent problems in the dynamics of negotiation; that content providers abuse market power, that they refuse to negotiate or supply, that there is asymmetric information and so on. Akerlof suggests that the problem is not that one side gets a bad deal in negotiation, but that the negotiation does not happen at all. In other words, trades which should happen, don't. This may in part explain the gap in investment and possible competition for online platforms.

Another category is regulated cost recovery. This consists of assessment for universal service funds, specific levies, taxes, and other regulatory instruments. Notably, if used, they should be transparent, independently verifiable, proportional to size and revenue of platform.

Finally, there are a set of technological cost recovery solutions such as global multicasting, default setting, data saving mode, auto play, and pre-download, and so on. However technological solutions are not necessarily free or even low-cost. They also entail tradeoffs and standards. So while some may prefer technological solution to a regulated one, firms may resist as it could entail a change of standards or loss of IP. Regulation could be required to force or adopt efficiency enhancing technologies.

While it is not a category as such, it could be that policymakers have unrealistic expectation of connectivity and should change their goals to be more realistic.

Comparison of three approaches

South Korea, USA, and EU are compared for their political philosophy explanation for the broadband shortfall, policy goal, policy instrument and proposed legislation. The three approaches are summarized in the following table.

	South Korea	USA	European Union
Political Philosophy	Technology Leadership	Pragmatism	Fundamental Rights
Shortfall	Ensure certainty and predictability that growing capacity costs are covered, expectation of shared responsibility of broadband providers and largest content providers	Some 20 million Americans either under-connected or facing affordability challenges, at least 8.3 million underserved locations. Growing Operating costs for networks, especially rural networks	€174 billion investment gap, accelerating rollout and uptake of next generation network which lags leading regions. 45 million Europeans identified as underserved versus goals.
Goal	Maintain technological leadership, recover network investment costs to continue leading globally in next generation networks	Ensure <u>affordability</u> for low-income Americans, ensure sustainability popular broadband subsidy programs (USF, ACP), avoid uncertainty of negotiation, expediency	Ensure gigabit connectivity for all Europeans ("fast, safe, reliable"). Empower relatively small European actors and nations to engage with global technology platforms to achieve goals
Policy Instrument	Market-based negotiation between broadband providers and largest content providers by traffic and users, backed by official traffic measures and safeguards for good faith	Largest edge providers contribute to USF. FCC collects and distributes revenue. Assessments possible on advertising revenue, number of users, cloud computing throughput etc. Preferred models avoid pass-through to end users.	Balanced negotiation
Proposed Legislation	Free Ride Prevention Act	FAIR Contributions Act	Gigabit Infrastructure Act

South Korea

For South Korea, maintaining global technological leadership is paramount. As such, the nation pursues the Free Ride Prevention Act³⁰ to formalize a market-based negotiation between broadband providers

³⁰ "(국회·정부)입법현황 | 국회입법현황 | 입법정보," accessed May 19, 2023, <https://opinion.lawmaking.go.kr/gcom/nsmLmSts/out/2117317/detailRP>.

the largest traffic generators. The bill mandates no fees but requires negotiation for network use and transparency of information and in general seeks fair, reasonable, transparent, and predictable conditions for network traffic exchange.

South Korean policymakers want to ensure that negotiation takes place in good faith, that parties honor their duty to deal, that they don't deploy abusive refusal to supply tactics, and that relevant information is available between the negotiating parties. The model is market-based, and its benefits include keeping cost affordable for end users and ensuring sufficient funding for next generation networks.

The bill attempts to resolve concerns that foreign content providers are favored and that they would delay and refuse to deliver content. It seeks to establish a reliable source of information for use of South Korea networks so that there can be transparency for contracts. The bill would apply to all South Korea broadband providers and only large content/application providers (1 million users or generating 1 percent of total network traffic). It would prohibit both broadband and content providers from engaging in unfair, discriminatory conditions or restrictions in these contracts; the unfair delay or refusal to conclude contracts; the refusal to pay for fair use of the network; and the failure to explain or the false explanation of service charges, terms, conditions in contract negotiation. Violators would be subject to penalty and corrective action, and broadband providers would be penalized the equivalent \$10k for failing to submit requested materials to authorities, or the submission of false materials.

The policy ethos of the Service Stabilization Act of 2022 reflects a recognition of shared responsibility between broadband providers and content application providers to ensure the quality of data delivery and user experience. In practice, policy ensures cost recovery of the installation and maintenance of fiber from the content provider to the broadband provider's core router. This provides dedicated bandwidth for the given content and protects against the degradation of the network experience for users which don't access that particular content.

The Telecommunications Business Act was amended to initiate a regime in which the largest content providers negotiate with broadband providers for cost recovery.³¹ The 5 eligible edge providers are Google, Netflix, Meta, Naver and Kakao (which together account for 41 percent of total traffic) and are defined as comprising more than 1 percent of total traffic and having at least 1 million users. Compensation is confidential and determined by the parties. There is no mandated government fee. As a means of a back of the envelope calculation using prevailing information on traffic data from Nielsen and other sources,^{32 33} the South Korean model if applied to the USA could generate some \$15 billion annually for the USF.

<https://opinion.lawmaking.go.kr/gcom/nsmLmSts/out/2117317/detailRP>. https://opinion-lawmaking-go-kr.translate.google.com/gcom/nsmLmSts/out/2117317/detailRP?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=da&_x_tr_pto=wapp. <https://blog.naver.com/yyc8361/222870020115>

³¹ Telecommunications Business Act. South Korea.

https://elaw.klri.re.kr/kor_service/lawView.do?hseq=59855&lang=ENG Jun. 9, 2020

³² Kim Kwanwoo, Korea Internet Neutral Exchange. "Internet Regulation in Korea," December 11, 2020, <https://35v.peeringasia.com/files/Internet.Regulation.in.Korea.pdf>.

³³ Oliver, Lloyd E., and John Pisarkiewicz. "A.C. NIELSEN MARKET SHARE DATA." *Antitrust Law Journal*, vol. 47, no. 3, 1978, pp. 1067–76. JSTOR, <http://www.jstor.org/stable/40840032>. Accessed 27 Feb. 2023.

Even as the traffic of global content providers rapidly increases, only a very few content providers with strong market dominance are free-riding on the network, observed³⁴ Ahn Jung-sang, senior advisor of the Democratic Party. “We are trying to clarify the legal basis for creating a win-win environment between telecommunications companies and content providers where content providers share the appropriate costs” he said.

The bill is driven in part with national frustration from firms like Netflix which have brought litigation declaring that it has no obligation to negotiate or pay for the use of Korea’s network. This follows a failed attempt³⁵ at regulatory mediation between Netflix and the local broadband provider which sought compensation after experiencing a near overnight 26-fold increase in traffic from Netflix, necessitating a \$40 million investment in equipment to manage the traffic. While the court rejected Netflix’s argument, the litigation has continued for two years as Netflix has produced new theories to claim that there are no contracts for transit and that its streams have always been settlement free.³⁶ The company further stonewalls the effort to establish cost recovery standards from prevailing contracts in the market.

South Korea adopted the Network Stabilization Act of 2020 which charges the Ministry of Science and Technology (MIST) must issue an annual report about the largest platforms and their relative percentages of traffic.³⁷ The legislation observes that the quality of content delivery is a shared responsibility between content and broadband providers. This obliges the largest parties to ensure the stability of their services, notably through the adequate provision of servers and other network equipment.

Additional impetus for the law comes from demonstrated complaints about Meta and its refusal to supply requested data to broadband networks, threats and actions of deliberate transit redirection to slow data transfer, and other anticompetitive tactics.³⁸ While Meta prevailed in the case from the Korean regulator, lawmakers interpret the tactics as an abuse of the Korean market which has delivered record

³⁴ “넷플릭스 망무임승차방지법’인데...산으로 간 국회 공청회,” 이데일리, September 20, 2022, <https://www.edaily.co.kr/news/read?newsId=03384966632462088&mediaCodeNo=257>.

³⁵ Roslyn Layton, “Should 23 Million South Koreans Pay More For Broadband When Only 5 Million View Netflix?,” Forbes, February 23, 2022, <https://www.forbes.com/sites/roslynlayton/2022/02/23/should-23-million-south-koreans-pay-more-for-broadband-when-only-5-million-view-netflix/>.

³⁶ Dr. Dae Keun Cho published the book “Nothing Is Free: An In-depth report to understand network usage disputes with Google and Netflix.”, <https://product.kyobobook.co.kr/detail/S000200146226>

³⁷ “보도자료 - 과학기술정보통신부,” accessed June 16, 2023, <https://www.msit.go.kr/bbs/view.do?sCode=user&mId=113&mPid=112&pageIndex=94&bbsSeqNo=94&nttSeqNo=3181364&searchOpt=ALL&searchTxt=>.

³⁸ “KCC Sanctions Facebook for User Service Infringement through Arbitrary Connection Reroute - Prevention Countermeasures Demand Improved Operations / Enforcement of Penalty -,” n.d., https://www.medianama.com/wp-content/uploads/KCC_sanctions_Facebook_for_user_service_infringement_through_arbitrary_connection_reroute.pdf.

profits for US internet platforms in recent years.³⁹ Notably Korean firms Naver and Kakao comply with the rules.

The need for broadband cost recovery emerges as the result of years of sustained policy to optimize many policy elements, including network investment incentives to ensure that broadband providers maintain a high level of investment, innovation and deployment. Notably if South Korea fails to deliver continued investment, it may lose technology leadership and global broadband standing.

Importantly the country took a soft approach of guidelines to net neutrality (not hard regulation) in 2011.⁴⁰ A decade hence, it is interesting and significant that these issues emerge in the world's leading broadband market which has the greatest concentration of next generation networks. It suggests that no network or policy solution is "future proof", and even the most advanced networks have significant ongoing broadband network costs.

The South Korean model has important appeal because it is a market-based model implemented in a leading modern nation, albeit a significantly smaller, relatively homogeneous nation. The model relies on the relative ease of measurement and metering of internet traffic from just 5 entities, including 2 domestic firms. Foreign traffic is relatively easy to measure as it enters the countries in a small set of locations. By contrast, the US has tremendous breadth, geographic diversity, and thousands of broadband networks.

Many prefer a market-based solution to this problem; after all there is a \$7 trillion internet economy and sufficient cash flow for investment. Naturally, market solutions are generally first best. Indeed textbooks of regulation generally prefer competition to regulatory intervention.⁴¹ However markets require certain prerequisites to work. The market economy is based on **voluntary exchange** in which parties find mutually beneficial outcomes. This assumes that edge providers come to the table, but they have no reason presently to do so.

Even if a negotiation could happen, it requires **perfect information**. Rural broadband providers and content providers have very little information about each other's business to make an efficient exchange. Moreover, there is not a **perfectly competitive market for content**. Platforms have dominance in their respective markets and hold proprietary content, data and services for which there are few, if any, substitutes. They could refuse to supply their content. At the same time, the broadband provider can't prevent edge providers from enjoying the benefits of broadband network upgrades (the so-called free rider problem). The content simply flows into broadband network unabated and without contracts in most cases.

³⁹ "Netflix, Google enjoy 90% jump in profit in Korea, while most went to headquarters - Pulse by Maeil Business News Korea," Pulse, April 15, 2022, [//pulsenews.co.kr/view.php?year=2022&no=338214](https://pulsenews.co.kr/view.php?year=2022&no=338214).

⁴⁰ See the KCC 방송통신위원회, *망 중립성 및 인터넷 트래픽 관리에 관한 가이드라인 제정*, <https://www.kcc.go.kr/user.do?mode=view&page=A05030000&dc=K00000001&boardId=1113&boardSeq=32867>

⁴¹ "Digital Regulation Handbook," ITU, 2020, <https://www.itu.int:443/en/publications/ITU-D/Pages/publications.aspx>.

Edge providers like Netflix have asserted that they have no obligation to negotiate or pay for the use of others' networks.⁴² Similarly, Meta had a long-standing interconnection agreement with Deutsche Telekom (DT), simply stopped paying.⁴³ This is a fundamental rejection of the market-based system, the tenet of which is **respect for property rights**. Under such conditions, market-based solutions cannot work.

Background on South Korea's Technology Leadership

South Korea's post-war growth and transformation has been described an economic miracle (period of dramatic economic development that is unexpectedly strong)^{44 45} and tiger economy (period of economic growth followed by improved standard of living).⁴⁶ It built upon the country's post-World-War II efforts to modernize from an impoverished, agrarian society to an industrial powerhouse in a generation, the so-called Han River Miracle (1961-1997) following the Korean War.⁴⁷ However, even when it joined the OECD in 1996, South Korea was still 30 percent below most other OECD nations in leading economic indicators. In a generation, South Korea has not just caught up, but has exceeded those measures.⁴⁸ It scores highly in OECD measure of science and technology, notably with the second highest research & development spend in the OECD, 4.8 percent of GDP.⁴⁹ The South Korea's growth and success has become critical to US defense and security policy for its soft cultural power and political importance as a capitalist democracy counterbalance to China.⁵⁰

The South Korean broadband success story reflects a blend of policy (industrial planning and market freedom), geodemographics, complementary industries, and culture. Having become a world leader in appliances, electronics, chemicals, pharmaceuticals, and other industrial inputs, South Korea executed

⁴² Son Ji-hyoung. "Legal logic takes new twist in SK-Netflix dispute." Korea Herald. June 22, 2016. <https://www.koreaherald.com/view.php?ud=20220616000704>.

⁴³ Mario Hilgenfeld and Matthew Newman. MLex. "Deutsche Telekom-Meta dispute over network fees to be transferred to German antitrust court." January 25, 2023. <https://mlexmarketinsight.com/news/insight/deutsche-telekom-meta-dispute-over-network-fees-to-be-transferred-to-german-antitrust-court>

⁴⁴ Schneidewind, Dieter K. *Economic miracle market South Korea: A blueprint for economic growth in developing nations*. Springer, 2016.

⁴⁵ Kong, Tat Yan. *The politics of economic reform in South Korea: A fragile miracle*. Vol. 1. Psychology Press, 2000.

⁴⁶ Derek Gregory; Ron Johnston; Geraldine Pratt; Michael J. Watts; Sarah Whatmore, eds. (2009). "Asian Miracle/tigers". *The Dictionary of Human Geography* (5th ed.). Malden, MA: Blackwell. p. 38. ISBN 978-1-4051-3287-9.

⁴⁷ This term comes from "Miracle on the Rhine", the notion of revitalizing Germany after World War II. Lee, Sang M.; Yoo, Sangjin (1987-01-01). "The K-Type Management: A Driving Force of Korean Prosperity". *Management International Review*. **27** (4): 68–77. JSTOR 4022786

⁴⁸ "Sustaining the Miracle on the Han River," OECD, October 25, 2021, <https://www.oecd.org/country/korea/thematic-focus/sustaining-the-miracle-on-the-han-river-103653fa/>.

⁴⁹ "OECD Main Science and Technology Indicators" (OECD, March 2022), <https://www.oecd.org/sti/msti-highlights-march-2022.pdf>.

⁵⁰ "The Growth of South Korean Soft Power and Its Geopolitical Implications > Air University (AU) > Journal of Indo-Pacific Affairs Article Display," October 31, 2022, <https://www.airuniversity.af.edu/JIPA/Display/Article/3212634/the-growth-of-south-korean-soft-power-and-its-geopolitical-implications/>.

an ambitious plan to connect the country with broadband beginning in 1994 with the Korean Information Infrastructure project.⁵¹ A partnership between Korea Telcom and the government connected 80 urban centers, government institutions, and a national backbone, followed by buildout to 144 regions with additional private providers joining the effort. In parallel, internet cafes emerged and “internet literacy” education to help spur home adoption with a key application of online banking. In 1999, the government implemented Cyber Korea 21, to accelerate IT development.

More than half the population was online by 2002, and by 2006, started rollout of 100 Mbps service, catalyzing multimedia development. Korean developers did more than copy US platforms; they innovated their own versions of email, ecommerce, virtual worlds, gaming, and social networks. Kakao (messaging, ride sharing, media etc.) and Naver (search, maps, content etc.) are two significant platforms. South Korea is the one country which has been able to produce technology to challenge US and Chinese behemoths like Apple, Huawei, Xiaomi and so on.⁵²

The “Korean Wave” or K-wave reflects the country’s unique and leading cultural economy which exports pop culture consumer goods and services, entertainment, music (K-pop songs like “Gangnam Style”), movies, and video (K-dramas “Squid Game”). Ubiquitous connectivity helps South Korea maintain its leadership has a hub for internet startups and this is bolstered with policy for tax breaks, investor incentives, favorable M&A policy, high R&D spend, and ease of visas.⁵³

However impressive the ubiquity of fiber to the home in South Korea, the country has been a leader in wireless broadband. South Korea capitalized on its geodemographics which favor broadband deployment. It is a country of 50 million people, roughly the size of Indiana, with half the population lives in the capital region. Fixed lined service is more economical when so many live in skyscrapers. More largely, few barriers were imposed to enter the broadband market, initially with DSL.

South Korea has been recognized for years as the global leader in information communications technology (ICT) by the United Nations International Telecommunications Union⁵⁴ and the Organization for Economic Cooperation and Development.⁵⁵ For the decade the ITU’s Measuring the Information Society report was published, South Korea scored at the top for measures of broadband access, use, and skills.⁵⁶ Importantly, broadband cost recovery and existing transit fee regimes have not slowed the rate of

⁵¹ Kilnam Chon, “Asia Internet History Projects - South Korea: Snapshot of the Internet around 2000,” October 7, 2012, <https://sites.google.com/site/internethistoryasia/book2/south-korea-snapshot-2000>.

⁵² https://www.amazon.com/Samsung-Rising-Inside-Korean-Conquer-ebook/dp/B07T9WTTZC/ref=sr_1_1?crid=23IGY45UFV454&keywords=samsung+cain+geoffrey&qid=1686907139&srefix=samsung+cain+geoffrey%2Caps%2C169&sr=8-1

⁵³ Ryan Frantz, “Why South Korea, the World’s Most Connected Country, Makes a Great Place to Scale Your Startup,” YourStory.com, May 8, 2023, <https://yourstory.com/2023/05/south-korea-makes-great-place-considering-startup-scaling>.

⁵⁴ “How the Republic of Korea Became a World ICT Leader?,” ITU Hub, May 29, 2020, <https://www.itu.int/hub/2020/05/how-the-republic-of-korea-became-a-world-ict-leader/>.

⁵⁵ “A Global Powerhouse in Science and Technology,” OECD, October 25, 2021, <https://www.oecd.org/country/korea/thematic-focus/a-global-powerhouse-in-science-and-technology-61cbd1ad/>.

⁵⁶ “Measuring the Information Society Report,” ITU, 2018, <https://www.itu.int:443/en/publications/ITU-D/Pages/publications.aspx>.

adoption of fiber to the home (FTTH) subscriptions in South Korea, which have increased for the last three years and now stand at 87 percent of total broadband connections, the highest in the Organization for Economic Cooperation and Development (OECD).⁵⁷ The country also led in 2022 for highest rate of 5G adoption, 45 percent.⁵⁸

South Korea's broadband success is an important topic among policy researchers globally.⁵⁹ While South Korea's success is result of an interplay of factors, it can be summarized by government leadership, fierce facilities-based competition, attractive pricing of devices and subscriptions, and urban density.⁶⁰ South Korea is not unique in having industrial policy related to the internet and the conceptualization of broadband networks being an input to the information economy, but it appears that South Korean policymakers were adept at seizing opportunity to implement policy, for example the privatization of state-run telecom companies and broadband policy promulgation during financial crisis.⁶¹

The nation's performance in next generation broadband deployment and adoption is unmatched and long-standing. Strand Consult documented South Korea's mobile wireless leadership in 2002 when it observed that South Korea was the first mover to provide advanced mobile services, not Japan as conventional wisdom held.⁶² The following year the market underwent a then unheard-of consolidation of 5 to 3 mobile networks because of a highly competitive market for mobile phones and falling prices.⁶³

USA

The US is frequently characterized as the bastion of free market liberalism, but a careful examination shows that the country has an extensive regulatory federal state dating from 1887 and the Interstate Commerce Act, as well as individual states, and even the Constitution itself which regulates the post, commerce, and other domains, and importantly creates a regulatory-free domain for speech and religion. Hence regulation in the United States is established and respected, albeit begrudgingly in some quarters.

For broadband cost recovery, the US has an established mechanism in the Universal Service Fund (USF). Through the USF, the FCC disburses approximately \$10 billion per year to fund broadband deployment to high-cost rural areas, schools and libraries, rural health care facilities, telehealth services, and broadband subsidies for low-income Americans. The USF collects money from telecommunications

⁵⁷ "Broadband Portal - OECD," accessed April 18, 2023, <https://www.oecd.org/digital/broadband/broadband-statistics/>.

⁵⁸ Pablo Lacopino, "5G Adoption and Mobile ARPU: Is There a Connection?," June 2023, <https://data.gsmaintelligence.com/research/research/research-2023/5g-adoption-and-mobile-arpu-is-there-a-connection->.

⁵⁹ Choudrie, Jyoti, and Heejin Lee. "Broadband development in South Korea: institutional and cultural factors." *European Journal of Information Systems* 13.2 (2004): 103-114.

⁶⁰ Lee, Choongok, and Sylvia M. Chan-Olmsted. "Competitive advantage of broadband Internet: a comparative study between South Korea and the United States." *Telecommunications Policy* 28.9-10 (2004): 649-677.

⁶¹ Lee, Sam Youl. "Korean information and communication technology policies." *Routledge Handbook of Korean Politics and Public Administration*. Routledge, 2020.

⁶² "The Korean Market for Mobile Services - A Window to 3G," *Strand Consult* (blog), March 11, 2001, <https://strandconsult.dk/the-korean-market-for-mobile-services-a-window-to-3g/>.

⁶³ "Korea's Mobile Market - A Window to 3G," *Strand Consult* (blog), March 11, 2004, <https://strandconsult.dk/koreas-mobile-market-a-window-to-3g/>.

carriers, set at a percentage of their interstate and international revenues, which carriers usually pass onto consumers in their monthly bills. This current system is not sustainable as the traditional voice telephone service and other traditional telecommunications services (including special access or business data services) which are assessed for USF are rapidly declining. Finding a sustainable source of revenue is necessary to ensure these critical programs can continue.

In August 2022 as part of the IJIA, the FCC submitted a report to Congress on the Future of the Universal Service Fund⁶⁴ with options “for improving its effectiveness in achieving the universal service goals . . . and other legislation that addresses those goals.”⁶⁵ Further the Commission notes its desire to build upon the USF and “improve the ability of the Commission to achieve its goals of universal deployment, affordability, adoption, availability, and equitable access to broadband.” The FCC’s report includes important points like the challenge to provide broadband in rural areas; the need for additional financial support for networks in areas where affordable pricing does not cover cost; providing support for the ongoing and maintenance cost of networks, not just one-time fixed cost; and the need for middle mile strategy.

The FCC’s report recognized the view by some expressed in the record that the companies which profit from broadband services, especially those provided through the USF, should contribute to USF.⁶⁶

There is interest from policymakers and broadband stakeholders to explore assessing edge providers for USF contributions. Commissioner Brendan Carr issued a statement in support of the FCC report to Congress noting, “As the Commission’s report determines, a diverse and wide-ranging group of commenters—including large and small industry stakeholders, consumer groups, public officials, state associations, and economists—have all determined that assessing the services offered by large technology companies would allow the FCC to broaden the contributions base in a fair and equitable manner, without harming consumers.”⁶⁷ FCC Chairwoman Rosenworcel called the idea of bringing large edge providers into the USF “intriguing.” “We should be open to new ideas. But it’s clear that this would require action from Congress,” she said.⁶⁸

Congress has listened and responded to the FCC’s report. Indeed, the bi-partisan Funding Affordable Internet with Reliable (FAIR) Contributions Act has been reintroduced in the 118th Congress.⁶⁹ Led by U.S. Senators Roger Wicker, R-MS, Ben Ray Lujan, D-NM, Todd Young, R-IN., and Mark Kelly, D-AZ, the bill would direct the FCC to conduct a study into the feasibility of collecting USF contributions from edge providers.

⁶⁴ FCC. “FCC Reports to Congress on Future of the Universal Service Fund.” August 15, 2022. <https://www.fcc.gov/document/fcc-reports-congress-future-universal-service-fund>

⁶⁵ Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, div. F, tit. I, § 60104(c), 135 Stat. 429, 1205 (2021) (Infrastructure Act).

⁶⁶ See paragraphs 98-102 of the FCC’s report.

⁶⁷ “Carr Statement: FCC Reports to Congress on Future of the Universal Service Fund,” FCC, August 15, 2022, <https://www.fcc.gov/document/fcc-reports-congress-future-universal-service-fund/carr-statement>.

⁶⁸ Ty Perkins, “Rosenworcel Says Carr’s Big Tech Proposal for Universal Service Fund ‘Intriguing,’” *Broadband Breakfast* (blog), June 7, 2021, <https://broadbandbreakfast.com/2021/06/fcc-chairwoman-rosenworcel-finds-carrs-big-tech-usf-proposal-intriguing/>.

⁶⁹ “Wicker, Lujan, Young, Kelly Reintroduce Bill to Explore Collecting USF Contributions from Big Tech.”

"It is important to ensure the costs of expanding broadband are distributed equitably and that all companies are held accountable for their role in shaping our digital future," noted Senator Wicker. Senator Luján, Chair of the U.S. Senate Commerce Subcommittee on Communications, Media, and Broadband," notes "The Universal Service Fund supports broadband access for rural communities across the country, ensuring families have access to economic opportunity, to school, and to health care. This report will examine how the largest tech companies can pay their fair share. The future is online and it's critical that essential broadband programs receive robust funding."

Among other provisions, the FAIR Contributions Act would direct the FCC to issue a Notice of Inquiry seeking public comment on the feasibility of collecting USF contributions from internet edge providers and issue a final report on the matter within 180 days. It would require the FCC to consider possible sources of edge provider revenue, such as digital advertising and platform fees; the fairness of the current system; the effects such a change would have on Tribal, low-income, and elderly consumers; and changes to current law necessary to implement this system.

Senators Ben Ray Luján and John Thune (R-SD) announced a bipartisan Senate working group to evaluate and propose potential reforms to USF. The goal of this working group is to create a bipartisan forum to guide education, awareness, and policymaking on this topic. The working group includes Senators Amy Klobuchar (D-MN), Shelley Moore Capito (R-WV), Gary Peters (D-MI.), and Jerry Moran (R-KS).⁷⁰

"Universal service is a bipartisan principle that has been the bedrock of our nation's communications policies for nearly 90 years, and programs that efficiently and effectively strengthen its underlying goal have contributed to advancements in health care, education, and economic development," said Thune, Ranking Member of the Subcommittee on Communications, Media, and Broadband. "I remain committed to ensuring Americans in rural parts of the country have access to communication services, and I am pleased to join Senator Luján in leading this working group."

"We took critical steps to expand broadband access when provisions based on my bill⁷¹ to bring high-speed internet to every family in America were included in the Bipartisan Infrastructure Law. But there's still more we can do to build on this progress," said Senator Klobuchar.

"All options need to be on the table to modernize and update the Universal Service Fund to encourage and maintain universal service with our sights set on a more responsible, predictable, and prudent USF that truly serves Americans in need of support. It is my hope that this bipartisan working group will result in productive discussions and solutions that will bring us closer to bridging the digital divide," said Senator Capito.

⁷⁰Press release. "Luján, Thune Announce Bipartisan Working Group on the Universal Service Fund and Broadband Access." <https://www.lujan.senate.gov/newsroom/press-releases/lujan-thune-announce-bipartisan-working-group-on-the-universal-service-fund-and-broadband-access/> May 11, 2023.

⁷¹Draft bill. "Reforming Broadband Connectivity Act of 2023." March 10, 2023. <https://www.congress.gov/bill/118th-congress/senate-bill/975/text?s=1&r=20>. The House version is H.R. 1812 sponsored by Rep. Joe Neguse (D-CO-02).

The House and Senate Reforming Broadband Connectivity Act are important steps to reform USF. However, they do not discuss incorporating edge providers or the funding and reforms for Lifeline and ACP. Senator Markwayne Mullin (R-OK) draft bill “Reforming Broadband Connectivity Act of 2023” suggests lowering costs for consumers by bringing large edge providers into USF.

Broadband policy is inseparable from affordability. As part of the Infrastructure Investment and Jobs Act (IIJA), the Affordable Connectivity Program (ACP) was established and has enrolled some 18 million⁷² households in a short period of time. ACP may be the most effective US broadband benefit program to date with its direct-to-consumer model. Eligible households can receive a discount of up to \$30 per month toward internet service (up to \$75 per month for eligible households on Tribal lands) and a one-time discount of up to \$100 to purchase a tablet, laptop, or desktop computer. For US policymakers, reform efforts imagine how to rollup the USF with the ACP in a sustainable model.

The benefits of ACP flow to more than just those who it helps subscribe to broadband. The single largest financial beneficiary of the ACP is the set of online advertising platforms, which earn more than \$60 per month per ACP user in advertising revenue.⁷³ ACP users drive an estimated \$15 billion annually in new advertising revenue to Alphabet, Meta, Amazon, and TikTok. However, these companies do not participate financially in federal or state broadband adoption programs. Whereas telecom providers have been paying billions of dollars for years to support USF, the richest tech platforms contribute zero.

In light of USF reform, there is an economic, historical, pragmatic, and ethical case to incorporate select “edge providers”--the largest tech companies Alphabet, Meta, Amazon, Microsoft, Apple, Netflix, and TikTok--into the USF and broadband cost recovery efforts. Assessing online advertising and cloud computing at a fraction of a percent could generate as much as USD \$5 billion-20 billion annually, more revenue than a double-digit percentage fee on telecommunications could.

Pragmatism

Winn explains that differences in tech policy between US and EU can be summarized with US philosophical emphasis on pragmatism versus the European narrative of individual rights, or in layman’s terms “law in action vs. law on the books.”⁷⁴ These terms could fit within the larger philosophical dichotomy of Anglo-American or “analytic”⁷⁵ philosophy for its focus on logical, mathematics, natural science, linguistics, and rigor vs. “Continental” philosophy, though some may define pragmatism as separate from analytic philosophy. While Continental is a catchall term for the various philosophical schools emerging on the European continent, one suggested through line is Kant and his emphasis on knowledge, experience, and reality are bound and shaped through philosophical reflection rather than exclusively empirical inquiry.⁷⁶ However the notion of a European rights tradition is likely a relatively

⁷² “ACP Enrollment and Claims Tracker,” *Universal Service Administrative Company* (blog), accessed June 16, 2023, <https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/>.

⁷³ <https://strandconsult.dk/recovery-for-broadband-use-a-study-of-the-business-model-for-50-broadband-providers-thatoffer-service-in-24-american-states/>

⁷⁴ Winn, Jane, *The Governance Turn in Information Privacy Law* (July 11, 2019). Available at SSRN: <https://ssrn.com/abstract=3418286> or <http://dx.doi.org/10.2139/ssrn.3418286>

⁷⁵ Avrum Stroll, *Twentieth-Century Analytic Philosophy* (Columbia University Press, 2000).

⁷⁶ Solomon, Robert C. (1988). *Continental philosophy since 1750: the rise and fall of the self*. Oxford; New York: Oxford University Press.

new, post-World War II development to mark a break with Europe's prior nationalistic history. Tuori suggests that Roman law provided a foundation for a common European legal heritage and basis for future integration and the focus on human rights instruments create a foundation for the European narrative which legitimized of European integration.⁷⁷ American pragmatism⁷⁸ was first defined by Peirce,⁷⁹ James,⁸⁰ and Dewey⁸¹; the EU by the narrative of individual rights of the Enlightenment.⁸² A similar dichotomy can be observed with the legal traditions of the practice of common law (courts) in the Anglosphere versus the codified statutes of civil or Roman law.

The idea to solve the problem of the need to reform USF and ensure the ACP would be an example of American pragmatism, using the tools at hand to get the job done, sensibly, realistically, and with expediency. Importantly there are other principles and values which inform the US approach which include but are not limited to federalism, equity, efficacy, legitimacy.

Federalism is the division and sharing of power between national and state government). Federalism ensures that all Americans have basic rights which transcend their location. That concept has been extended to the economic and social realms to ensure that all Americans have access to opportunity and advancement without discrimination to their sex, race, or religion. Importantly broadband can be an enabler of rights and thus equality of access and opportunity ensured through USF, is recognized. The meaning, applicability, and purpose of Universal Service has evolved over time. One important notion is to lessen the geographic digital divide and achieve parity between rural/Tribal areas and urban areas, between elderly and youth, and so on.

Another salient notion in US broadband policy has an ethical quality with an increasing focus on equity (fairness and justice). Many policymakers demand digital equity goals for world class broadband, particularly for those who live in rural, disadvantaged, minority, and low-income communities. While the USF began with the 1996 Telecommunications Act, its history stretches back decades. "The phrase universal service, which first emerged in telephone policy debates in 1907, did not mean a telephone in every home or rate subsidies, but the interconnection of the systems into a unified, non-fragmented service," observes telecom policy scholar Milton Mueller.⁸³ Notions of universal service

⁷⁷ Tuori, K. (2022). The invention of the European legal tradition and the narrative of rights. *Journal of European Studies*, 52(3–4), 204–218. <https://doi.org/10.1177/00472441221115569>

⁷⁸ measures the truth of an idea by experimentation and by examining its practical outcome.

⁷⁹ Charles Sanders Peirce is called the "father of American pragmatism", what he called pragmaticism, an application of the scientific method to every problem. <https://plato.stanford.edu/entries/peirce/>

⁸⁰ View that James developed a language based on 19th century American material and corporate developments like the Civil War and railroads etc. <https://www.amazon.com/Henry-James-Philosophy-Literary-Pragmatism/dp/1137594470>

⁸¹ Adaptation of the human to his environment. <https://iep.utm.edu/john-dewey/>

⁸² "The Enlightenment and Human Rights · Explore · LIBERTY, EQUALITY, FRATERNITY: EXPLORING THE FRENCH REVOLUTION," accessed June 16, 2023, <https://revolution.chnm.org/exhibits/show/liberty--equality--fraternity/enlightenment-and-human-rights>.

⁸³ Milton Mueller. "Universal service in telephone history: A reconstruction." *Telecommunications Policy*. 1993, vol. 17, issue 5, 352-369.

evolved to include concepts like a phone in every home and today the principle that all Americans should have access to communications services.⁸⁴

A better realization of USF today would restore of business-to-business contributions model of universal service practiced from until 1995. Joel Thayer of the Digital Progress Institute (DPI) explains,

“Although the complexities and competitive inequities of the current contribution system are well known, less well recognized is the historical atypicality of who now pays for universal service. From the Kingsbury Commitment of 1913 until the 1990s, businesses that relied on the telephone system to make long-distance calls bore the lion’s share of the cost of providing universal service to local residences. It was only after the adoption of the current, interstate end-user telecommunications revenues system in 1997 and the parallel rise of all-distance plans and ubiquitous wireless communications that led to today’s inequitable system. The current contribution regime saddles American families, veterans, working adults, and the elderly with the brunt of the costs for universal service. Compare this to the corporations that rely on broadband and the telephone network to make a profit and contribute little if anything at all.”⁸⁵

DPI further observes an exploitation of the current USF in the form of a 20-year-old self-provider exemption from contributions. “Some of the largest companies in the world like Google and Tencent have deployed extensive fiber backhaul networks that interconnect with other telecommunications providers. Because of the exemption, some of the largest corporations in the online economy can get access to faster service without any contribution to the Universal Service Fund,”⁸⁶ it notes.

DPI further advocates that the Commission shift the burden of contributions away from consumers and onto the corporations that profit from universal service. “The largest companies in the Internet economy, which contribute almost nothing to the Universal Service Fund today, are far less diverse—with fewer “people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality”—than the American public at large. In other words, such as shift would promote fairness and equity in the program, in line with the Commission’s goal of advancing diversity, equity, inclusion, and accessibility in the broadband arena.”⁸⁷

In addition to the many economists and academics which support the study and incorporation of edge providers into USF,⁸⁸ many social advancement organizations have noted similarly and have filed such comments to the FCC including but not limited to the Multicultural Media Telecom and Internet Council, ALLvanza, Asian Pacific Islander Association, Asian & Pacific Islander American Health Forum, Asian and Pacific Islander American Vote , Asian Pacific American Women, Filipina Women's Network, Hispanic

⁸⁴ Federal Communications Commission. Universal Service. <https://www.fcc.gov/general/universal-service>. Accessed May 3, 2023.

⁸⁵ Joel Thayer, Digital Progress Institute. Comments on the Future of Universal Service. February 17, 2022. <https://www.fcc.gov/ecfs/search/search-filings/filing/102171749402322>

⁸⁶ Ibid

⁸⁷ Ibid

⁸⁸ Letter from Academics and Policy Scholars. Comments on the Future of Universal Service. February 17, 2022. <https://www.fcc.gov/ecfs/search/search-filings/filing/1021795683920>

Federation, The National Latino Voice in Tech & Telecommunications Policy, Institute for Asian Pacific American Leadership & Advancement, International Leadership Foundation, The Latino Coalition, LGBT Tech, MANA, A National Latina Organization; National Asian/Pacific Islander America, Chamber of Commerce & Entrepreneurship, National Association of Asian American Professionals, National Council of Asian Pacific Americans, National Federation of Filipino American Associations, National Queer Asian Pacific Islander Alliance, Sikh American Legal Defense and Education Fund, and US Hispanic Chamber of Commerce.

As the largest edge providers are among the most profitable entities in the US economy there is efficacy to include them in USF. They derive their value through services transmitted and accessed from broadband networks. They are inherently dependent on the quality, availability, and affordability of broadband. There are certain features of these companies which make them attractive for USF assessment.

US internet advertising revenue today (\$222 billion⁸⁹) already rivals the US broadband market (\$228 billion⁹⁰). The US online ad market is expected to accelerate in future as a significant portion of \$130 billion in offline advertising revenue becomes digital. US online advertising revenue grew at 130% between 2017-2022. Meanwhile broadband revenues are expected to grow at 3 percent. Already the US ad revenue from Alphabet, Meta, Amazon, TikTok, and Microsoft top \$200 billion.

The market for cloud computing in the US, \$258 billion, also dwarfs US broadband. Globally the industry drives more than half a trillion dollars in revenue annually, has a market size of more than \$2 trillion, and grows at 16%.⁹¹ AWS, Microsoft Azure, and Google Cloud enjoy 80% of the global market for cloud computing.

The scale and growth dynamics just of online advertising and cloud computing would allow the largest providers to be assessed at only a fraction of a percent (even decreasing over time) to provide a stable, sufficient source of revenue for USF and ACP. This provides a compelling contrast to the whopping 30% fee assessed on telephony and even 4% assessed on broadband. Moreover, revenue could be raised on a handful of edge providers, reducing the need for oversight and reporting on thousands of entities which participate today and whose services are in decline.

A third reason a focus on edge providers has efficacy is that many companies will be unlikely to pass costs on to end users, thus keeping the costs on consumers low. For example, Meta and Alphabet earn revenue from advertisers; end users do not need to provide a credit card to access the flagship Google and Facebook services. As there is no billing arrangement from Google and Facebook to end users in most cases, the likelihood that fees can be passed through is low.

Having the FCC at the helm of broadband cost recovery provides legitimacy. While the concept of Universal Service has been a feature of US telecom policy for decades, in 1996, the FCC was charged with

⁸⁹ Statista. "Online Advertising Revenue Since 2000." <https://www.statista.com/statistics/183816/us-online-advertising-revenue-since-2000/>. Accessed May 25, 2023

⁹⁰ Ibid Matthey

⁹¹ Statista. "Worldwide Market Share of Leading Cloud Infrastructure Service Providers." <https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers/> Accessed May 25, 2023.

managing the fund. Over time, the FCC has gained the experience of managing a subsidy program in the size, scale, and scope unlike any other agency in the world. The USF instrument is recognized and respected.

The USF is an important intermediary in the broadband ecosystem and mitigates against the concern that direct negotiations between broadband and edge providers would create suboptimal outcomes. Indeed, the FCC, not broadband providers, collects revenue, determines how funds are used and who receives them. Moreover, the FCC has discretion to adjust and adapt the contribution and distribution mechanisms.

EU

However, an American style USF solution is not necessarily desirable in EU given ongoing debates about EU power and centralization and concern that fund distribution would favor some states over others. Hence empowering European firms and states to negotiate with tech companies makes sense. While the EU founded to build to strengthen markets and economic development, it has increasingly focused on regulatory interventions to deliver fundamental rights. However, an American style USF solution would be difficult to do in Europe as there is no pan-European assessment authority. Hence empowering individual EU actors, whether firms or states, to engage with tech companies for cost recovery makes sense. This is an important role which the EU sees its role, both in strengthening its own legitimacy but also in empowering the individual member states.

EU efforts to regulate so-called Big Tech provides an important display of European autonomy and sovereignty,⁹² a form of technology leadership and legitimacy in a competitive multi-polar world.⁹³ Moreover, the EU expression of fundamental rights as the means and ends for technology policy is increasingly observed, whether the regulation for net neutrality, data protection, artificial intelligence, antitrust and so on.

EU Political economy

The opening for an EU solution emerged with European Commission launching together a consultation on the *future of electronics communications networks and their infrastructures*⁹⁴ and a proposal for the Gigabit Infrastructure Act.⁹⁵ The European Parliament weighed in on this topic with a recommendation in its 2022 Competition report noting,

⁹² Broeders, Dennis, Fabio Cristiano, and Monica Kaminska. "In Search of Digital Sovereignty and Strategic Autonomy: Normative Power Europe to the Test of Its Geopolitical Ambitions." *JCMS: Journal of Common Market Studies* (2023).

⁹³ Sahin, Kaan, and Tyson Barker. "Europe's capacity to act in the global tech race: Charting a path for Europe in times of major technological disruption." (2021): 43.

⁹⁴ "The Future of the Electronic Communications Sector and Its Infrastructure | Shaping Europe's Digital Future," EU, February 23, 2023, <https://digital-strategy.ec.europa.eu/en/consultations/future-electronic-communications-sector-and-its-infrastructure..>

⁹⁵ "Gigabit Infrastructure Act Proposal and Impact Assessment | Shaping Europe's Digital Future," February 23, 2023, <https://digital-strategy.ec.europa.eu/en/library/gigabit-infrastructure-act-proposal-and-impact-assessment.>

“... the economic sustainability of telecom networks is essential to achieving the 2030 Digital Compass connectivity targets and high performance connectivity for all citizens within the EU without jeopardising competition rules; urges the Commission to address and mitigate persistent asymmetries in bargaining power as set out by the European Declaration on Digital Rights and Principles for the Digital Decade; calls for the establishment of a policy framework where large traffic generators contribute fairly to the adequate funding of telecom networks without prejudice to net neutrality” (para 44)⁹⁶

A European move toward broadband cost recovery can be explored as a logical, sequential step in regulating the technology sector, following regulation of telecommunications. The European Commission (EC) is the independent executive arm of European Union.⁹⁷ It makes proposals for legislation and implements European Parliament decisions. This consultation demonstrates the separation of powers of the European Union, which along with the European Council and courts, constitute the EU’s democratic model. Importantly, this consultation fits well within the EC’s remit to “protect the interests of the EU and its citizens on issues that can’t be dealt with effectively at national level.”⁹⁸ Moreover it addresses specific priorities for “developing a strong and vibrant economic base” and “building a climate-neutral, green, fair and social Europe.”⁹⁹ The experience of Covid-19 demonstrates that all people and enterprises of the EU need robust connectivity to ensure remote work, education, and health among other services like e-government.

The Charter of Fundamental Rights of the European Union (2000)¹⁰⁰ makes important declarations including that it is “conscious of its spiritual and moral heritage”, that the Union is “founded on the indivisible, universal values of human dignity, freedom, equality and solidarity”; that it places the “individual at the heart of its activities, by establishing the citizenship of the Union and by creating an area of freedom, security and justice.” It deems it “necessary to strengthen the protection of fundamental rights in the light of changes in society, social progress and scientific and technological developments by making those rights more visible in a Charter.” Importantly, it observes that “Enjoyment of these rights entails responsibilities and duties with regard to other persons, to the human community and to future generations. The Union therefore recognises the rights, freedoms and principles set out hereafter.”

Similarly, Chapter II of the EU Declaration of Digital Rights and Principles (2023)¹⁰¹ on “Solidarity and Inclusion” describes the goal of “developing adequate frameworks so that all market actors benefiting

⁹⁶ René Repasi, “REPORT on Competition Policy – Annual Report 2022 | A9-0183/2023 | European Parliament,” May 8, 2023, https://www.europarl.europa.eu/doceo/document/A-9-2023-0183_EN.html.

⁹⁷ “European Commission – What It Does | European Union,” accessed May 19, 2023, https://european-union.europa.eu/institutions-law-budget/institutions-and-bodies/search-all-eu-institutions-and-bodies/european-commission_en.

⁹⁸ Ibid

⁹⁹ “Priorities of the European Union 2019-2024 | European Union,” accessed May 19, 2023, https://european-union.europa.eu/priorities-and-actions/eu-priorities/european-union-priorities-2019-2024_en.

¹⁰⁰ “Charter of Fundamental Rights of the European Union” (EU, December 18, 2000), https://www.europarl.europa.eu/charter/pdf/text_en.pdf.

¹⁰¹ “European Declaration on Digital Rights and Principles | Shaping Europe’s Digital Future,” EU, February 7, 2023, <https://digital-strategy.ec.europa.eu/en/library/european-declaration-digital-rights-and-principles>.

from the digital transformation assume their social responsibilities and make a fair and proportionate contribution to the costs of public goods, services and infrastructures, for the benefit of all people living in the EU.”

The notion of a “fair and proportionate contribution” underscores the consultation and builds on a foundation of inviolable fundamental rights for individuals. Similarly, there is a recognition that policy must be developed to ensure a “fair and proportionate contribution” to “services and infrastructures.” This presumes the obligations and responsibilities of electronic communications networks (ECN) which are enumerated in EU law. Moreover, this consultation also suggests that large technology platforms, which the EC defines as “large traffic generators” (LTG), also have responsibilities and that the consultation will assist to define and codify these requirements.

As such, the consultation has very little to do with the economic impacts of the policy to the relevant parties. It follows in the vein of 2015/2120 which did not discuss whether the law was positive, negative, or indifferent to the economic outcomes for regulated parties.¹⁰² Rather, it was a statement of principle for end user rights. Importantly this consultation builds upon prior EU policy and does not negate or deviate from the stated goals.

Similarly, this consultation on the future of the electronic communications sector and its infrastructure is primarily focused on the rights of individuals. It observes, “Reliable, fast and secure connectivity is a must for everybody and everywhere in the Union, including in rural and remote areas.” Hence the conclusion is that both ECNs and LTGs must contribute in a “fair and proportional” way.

A second remit of the EC is to “get technical details right by consulting experts and the public.”¹⁰³ The consultation is further legitimized with its detailed requests for information through an open and public process. Anyone can participate in the consultation, specific questions are asked, and responses will be made public. This demonstration of process and transparency are also important elements of EU democracy.

Law and policy based purely on common sense, intuition, and anecdote may be arbitrary and subjective. Hence policymakers attempt to build policy on a robust foundation of objective, factual information and evidence. This is easier said than done. In an ideal world, the testing of public policy could be conducted like a randomized controlled trial (RCT) for medicine. That is not a practical approach for many public policies as the systematic collection and assessment of information can be costly and difficult. However, policies can attempt to amass a database of information which is statistically significant to the problem at hand. At the very least, a minimum set of facts can establish whether a problem exists and how serious it is.

¹⁰² “Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 Laying down Measures Concerning Open Internet Access and Amending Directive 2002/22/EC on Universal Service and Users’ Rights Relating to Electronic Communications Networks and Services and Regulation (EU) No 531/2012 on Roaming on Public Mobile Communications Networks within the Union (Text with EEA Relevance),” 310 OJ L § (2015), <http://data.europa.eu/eli/reg/2015/2120/oj/eng>.

¹⁰³ “European Commission – What It Does | European Union,” accessed May 19, 2023, https://european-union.europa.eu/institutions-law-budget/institutions-and-bodies/search-all-eu-institutions-and-bodies/european-commission_en.

In any event, it is appropriate that the EU improve its understanding of the future needs of the electronic communications sector and its infrastructure with the collection and analysis of data. Although the data collected will likely be imperfect; the quality of the analysis will depend in part on what is received; and the EC, made up of human beings, is not omnipotent and can never know all the things. However, this is still better than attempting to make policy with no data at all, or to ignore a problem because of failure to investigate it.

There will always be informational challenges, but that is not an excuse to do nothing. Indeed that the EC takes on this topic likely reflects the concerns that arise a democracy and demand policymakers' attention.

The need for consultation appears to be further supported by the EU's reported stagnation on the Digital Economy and Society Index (DESI).¹⁰⁴ This is an important benchmark to measure the quality of EU policy versus its goals. The Index has been published since 2014 and shows stagnation in important measures. More than half of member nations score below the EU average for connectivity, human capital, use of internet services, technology integration, and digital public services.

To achieve these goals, it is likely necessary to revisit EU policy in a range of domains. The consultation itself poses some of these questions, for example whether some goals could be furthered in-country consolidation for ECNs, EU-wide licensing, and spectrum harmonization. It follows that if the EU had more funds for infrastructure investment, it could improve its measures for connectivity, the use of internet services, and possibly digital public services.

Regardless of one's view of the EU's fundamental approach to individual rights, it has succeeded to be adopted in EU and around the world. The key example is the General Data Protection Regulation (GDPR), which has become the de facto global standard for data protection. This has been adopted by South Korea, Japan, Brazil, Turkey, Chile, South Africa, Argentina, and other countries. The EU's approach for fundamental individual rights has been salient in law and practice.

In his study of the growth of regulation in Europe the EU, national and community levels, Giandomenico Majone suggests that "Privatization and deregulation have created the conditions for the rise of the regulatory state to replace the dirigiste state of the past."¹⁰⁵

In *Neoliberalism, Ordoliberalism and the Future of Economic Governance*, the authors suggest that "neoliberalism" was proposed as an alternative for perceived failure of "liberalism" (what they call laissez-faire as creating the poverty in Germany, the American depression and associated economic protectionism in the USA, and totalitarianism in communist countries.). Nobel Prize laureate Friedrich Hayek warned that Europe would take a road to serfdom depending on Germany's path after the war. Hayek had influence with the 'Freiburg School of ordoliberalism' and "inspired not only the

¹⁰⁴ "The Digital Economy and Society Index (DESI) | Shaping Europe's Digital Future," accessed May 19, 2023, <https://digital-strategy.ec.europa.eu/en/policies/desi>.

¹⁰⁵ Majone, Giandomenico. "The rise of the regulatory state in Europe." *The State in Western Europe Retreat or Redefinition?*. Routledge, 2019. 77-101.

institutionalization of Germany's post-1945 'social market economy', but also the 'constitutionalizing' of the European Union's 'competitive social market economy' (as prescribed in Article 3 of the 2007 Lisbon Treaty). Ordoliberal methodologies can, likewise, inspire a humane rebuilding of the world trading and investment systems if it should ever be possible to reform the current dictatorships suppressing human rights (e.g. in China, Iran, Russia, and other authoritarian UN member states) and neoliberal nationalism (as illustrated by the 'Brexit' and by US protectionism disrupting multilateral trade law). *The Oxford Handbook of Ordoliberalism*¹ explains why general statements about 'the ordoliberals' are misleading; why European ordoliberalism prioritizes values and decision-making procedures different from American neoliberalism; and why the ordoliberal research program remains an unfinished task, especially at our time when authoritarian 'subordination-orders' (based on 'discretionary rule of persons' rather than 'rule-of-law') undermine market- and rules-based 'coordination-orders'. As explained by Victor Vanberg in chapter 14, by perceiving economic regulation as part of a much broader moral, social, and political project, ordoliberals continue the classical political economy research initiated by Adam Smith by exploring—from a reasonable citizen perspective—the legal-institutional framework for market economies reconciling the individual pursuit of self-interests with the common citizen interests in public goods and social justice."

The effort to create an economic integration which had many factors and influences including but not limited to rebuilding the continent following devastation of World War II, political instability of various states, ceding of defense to US and NATO, view of create a bloc of capitalism to counter Soviet communism, and so forth. While we could date this to 1951 and the founding of the European Coal and Steel Communities, we can trace ideas for economic alliances even further back, e.g., Anglo-French Alliance in 1914. A series of European Economic Communities have evolved over the decades (Brussels 1967, Avignon 1970, Schengen 1985, Maastricht 1993, Amsterdam 1999, Nice 2003, and importantly Lisbon 2009) along with parallel developments in the period by United Nations, Council of Europe, and individual member states on individual and human rights.

European approach to cost recovery

A European approach is still taking shape. A joint submission to the European Commission from trade associations ETNO and GSMA call for "balanced negotiation."¹⁰⁶ Other organizations have asked for policy to ensure data efficiency and green energy principles.¹⁰⁷ Preliminary academic reviews of the consultation discuss externalities and the need for regulatory intervention as a pure market negotiation with asymmetric information might not resolve the underinvestment problem.¹⁰⁸ Others suggest a cost-sharing mechanism where a content provider contributes to covering the costs incurred by a network operator when delivering content to consumers.¹⁰⁹ Another suggest cost sharing triggers a virtuous circle

¹⁰⁶ "Telecom Sector Joins Forces in Call for New Policies to Drive EU Connectivity Leadership," *GSMA Europe* (blog), May 19, 2023, <https://www.gsma.com/gsmadeurope/news/telecom-sector-joins-forces-in-call-for-new-policies-to-drive-eu-connectivity-leadership/>.

¹⁰⁷ "Ecta Statement on Suggested Contribution to Network Investment ('Fair Contribution' Debate)," ECTA, September 13, 2022, <https://www.ectaportal.com/news/ecta-press-releases/1556-ecta-statement-on-suggested-contribution-to-network-investment-fair-contribution-debate>.

¹⁰⁸ Condorelli, Daniele and Padilla, Jorge, Fair Share Payments for Network Investments (June 4, 2023). Available at SSRN: <https://ssrn.com/abstract=4468870> or <http://dx.doi.org/10.2139/ssrn.4468870>

¹⁰⁹ Jullien, Bruno and Bouvard, Matthieu (2023), "Fair cost sharing: big tech vs telcos", working paper

that incentivizes the content provider to reduce its traffic, which lowers prices for the end consumer and thus increases, not only the consumers surplus but also the profits of the ISP as well as those of the content provider.¹¹⁰ Another observes that cost sharing can encourage digital platforms to better optimize traffic generation.¹¹¹ Another suggests that cost recovery efforts could reduce costs to end users.¹¹²

Conclusion

This paper reviewed emerging broadband cost recovery efforts in the South Korea, USA, and EU and the different policy approaches based upon the set of political economic factors in the region. The choice of policy instrument for cost recovery reflects the distinctive political economy. For example, South Korea wishes to maintain global technology leadership; the USA, to ensure affordability for end users and sustainability of its existing broadband subsidy efforts and taking the pragmatic approach of using proven, existing tools rather than inventing new methodologies; and the EU, to ensure fundamental rights as well as to empower small European nations and firms to engage with powerful global players, an important theme in EU tech policy. The paper reiterated the claims of many governments of the shortfalls in broadband investment and adoption.

¹¹⁰ Jeanjean, François, Fair Cost Sharing in Telecommunication Industry, a Virtuous Circle (November 21, 2022). Available at SSRN: <https://ssrn.com/abstract=4282687> or <http://dx.doi.org/10.2139/ssrn.4282687>

¹¹¹ Baranes, Edmond and Vuong, Cuong Hung, Economic Contribution to the Debate on Cost Sharing Policy (March 9, 2023). Available at SSRN: <https://ssrn.com/abstract=4383218> or <http://dx.doi.org/10.2139/ssrn.4383218>

¹¹² "Proposals for a levy on online content application providers to fund network operators — An economic assessment prepared for the Dutch Ministry of Economic Affairs and Climate." Oxera Consulting LLP. 30 January 2023. <https://www.government.nl/documents/reports/2023/02/27/proposals-for-a-levy-on-online-content-application-providers-to-fund-network-operators>