

Consumers Are the Ones Who End Up Paying for Sending-Party-Pays Mandates

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Policymakers in some nations want edge companies such as Netflix to pay a larger share of broadband infrastructure costs. These “sending-party-pays” policies would harm Internet users, disproportionately tax U.S. tech companies, and fail to deliver infrastructure improvements.

KEY TAKEAWAYS

- Sending-party-pays policies—in which companies such as Netflix pay mandated prices to have their services delivered the last mile to customers—distort prices in the complex Internet peering and transit services market, resulting in inefficient traffic management.
- The optimal price of peering varies widely and changes rapidly depending on network effects and the price elasticity of demand. Regulating it is likely to raise prices for consumers while driving some out of the market for certain online services entirely.
- Broadband infrastructure is not a zero-sum burden because edge companies aren’t just users; they also build delivery networks and cache content to improve performance. And users both create and consume content, which gives Internet services their value.
- South Korea’s experiment with sending-party-network-pays has caused less-efficient traffic flows, higher prices, and lower content quality. It is a cautionary tale for policymakers considering sending-party-pays.
- Proposals in Europe are likely to produce similar results to those in South Korea, which may explain why European regulators have rejected such proposals in the past.
- Expanding universal service fees to edge services is the wrong way to offset the rising costs of U.S. subsidy programs and would raise Internet prices for consumers. Policymakers should instead reduce USF expenditures, especially for rural broadband.

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INTRODUCTION

Recently, policymakers in the United States and other nations have begun to consider, and in some cases implement, policies that seek to get edge companies—those who produce and send content to end users over the Internet—to pay a larger share of the cost to build and maintain Internet service providers’ (ISPs’) broadband network infrastructure. While the political appeal of “sending-party-pays” (SPP) proposals is undeniable—especially when many of the payers are U.S. technology firms and the receivers of the cash are domestic telecommunications companies—they actually result in harm to Internet users, do not achieve fair results, and cannot deliver the windfall infrastructure funding they promise.

SPP proposals come in different forms, from imposing a special tax on edge services to directly regulating rates in peering markets. In all cases, the policy is based on a misunderstanding of how the market for Internet traffic works and who really pays the costs that the policy would entail. Rather than getting better broadband networks at the expense of large American tech companies, SPP imposes unnecessary costs on the users of edge services and distorts the prices that would otherwise coordinate the Internet marketplace.

ECONOMICS OF INTERNET TRAFFIC

In a world of global Internet traffic, content is unlikely to remain on one network all the time. Rather, the traffic often flows across many different networks to get to its destination. The process of exchanging data between these networks is called “peering.”¹ Peering agreements are as much a business arrangement as they are a technical one; network operators bargain their way to an agreement, often based on the volume of traffic flowing from one network to the other. If traffic flows are roughly equal, for example, the network operators often agree not to charge a fee to connect their networks; this is known as settlement-free peering. Other times, a network accepting more traffic than it is sending to its counterpart will charge the sending network a fee

to compensate it for the asymmetrical burden placed on the network. Though end users will seldom notice the impact of peering negotiations, they are always in the background of successful routing of Internet traffic, on top of the standard contracts for broadband service at the first and last mile.

Transit is another option in which, rather than directly exchanging traffic, ISPs pay a third party to route their traffic. Transit and peering each offer their own advantages: Transit pricing is essentially variable costs based on the volume of data, while the costs of peering are essentially fixed and therefore benefit from economies of scale.² On the other hand, money put toward transit is also money that could otherwise be invested in one's own network.³ The choice between peering and transit depends on a variety of business factors, and not all combinations are equally viable.

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Importantly, peering arrangements are market transactions between companies that understand their products and seek to make money by selling those products to customers. The sum of these negotiations between many companies on each side generates a market price that captures the dispersed information about the resources available for peering and signals other market actors about where and how additional resources could be employed.⁴ Policies that regulate the market price, such as SPP, hobble this coordination process and put a thumb on the scale of these negotiations by mandating the price that one party (the edge provider) must pay the other (the ISP). The mandated price then no longer reflects the real scarcity of network load and capacity and, therefore, distorts signals to the market.

To make this more concrete, consider the following two ways of conceptualizing the role of a broadband provider in the business of serving content from edge companies to end users. Under neither model do SPP policies efficiently transfer money from edge companies to ISPs in a way that benefits consumers.

Sending-Party-Pays With Two-Sided Markets

A two-sided market exists when a supplier and end user both rely on a service provided by a third party. The relationship between an edge company, a broadband provider, and an end user is often analyzed as a two-sided market: The edge company and the end user both rely on broadband infrastructure to send and receive data.

Discovering the optimal price in a two-sided market depends primarily on network effects.⁵ For example, if the additional content provided to a user is more valuable to that user than the user is to the edge company, it makes sense for the ISP to charge a higher share of the total price of delivering that content to the end user. The reverse is also true: If the end user is more valuable to the edge company than the edge content is to the user, then it makes more sense for the edge provider to bear more of the cost of accessing that user.

One economic analysis of this dynamic concludes that the optimal division of price for consumers can, but does not always, coincide with the division of price that maximizes ISP

profits.⁶ Notably, the authors of that analysis determined that a regulated price of zero (which aligns with some conceptions of “net neutrality”) will tend to increase content providers’ profits at consumers’ expense. But it does not follow that a higher regulated price will achieve higher consumer surplus as opposed to increasing ISPs’ profits. Indeed, outcomes of the model are highly sensitive to the strength of the network effects for each user and each content provider, and these vary across different types of services and over time.

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Another analysis of a two-sided-market model for Internet content similarly concludes that it is “unclear” whether price regulations would yield welfare-maximizing outcomes given that the Internet value chain is both complex and dynamic.⁷ That report highlights the varying levels of competition among broadband providers and content companies as well as the many steps involved in carrying packets from one place to another. One might also consider the varying tastes and demands of consumers and changes that will rapidly alter what the regulated price “ought” to be, no matter how carefully it was calculated before.

In short, when examined as a two-sided market, the Internet-content market immediately becomes too complex for a regulated price ever to properly allocate the correct price on each side. On the other hand, bargaining for these services on the open market does offer the opportunity to reach a rational price that can react to and change with the complex parameters of the Internet ecosystem. It is, therefore, folly for regulators to micromanage the price of peering and transit services, and attempts to do so are unlikely to result in beneficial results for consumers.

Incidence of Sending-Party-Pays Policies

An alternative model questions an essential premise of two-sided-market theory, namely that the two parties on the “outside” of the transaction (i.e., the content provider and the end user) do not also negotiate between themselves in addition to dealing with the ISP in the middle. For many types of edge services, this assumption does not hold. Netflix users, for example, have a deal with both their ISP and Netflix itself. They pay money to their ISP for broadband (which includes the costs of downloading data as well as uploading it) and pay Netflix (and other content providers) to get access to its content.

This feature makes a critical difference to the economic analysis since, in the presence of contracts between edge companies and end users, any fee mandated upon the edge provider can then be (at least partially) passed through to the end user. In this sense, the excess peering price (i.e., the amount by which it exceeds the price that would prevail without an SPP mandate) may be considered in a framework akin to tax incidence, which teaches that the party that bears the cost of a tax does not depend on who writes the check to the government.⁸ While the excess fee will be paid by the edge company directly, it is naïve to stop the analysis there. Because the mandated fee is essentially an increase in the edge company’s cost of doing business, it will result in an increased price to end users. This price increase will result in some consumers paying the higher price and some deciding to abandon the service. Thus, though for accounting purposes the money is transferred from the edge company to the broadband provider, the real

cost, which may be either increased monetary expenditures or reductions in content quality, is divided between the edge company and its customers.

The actual allocation of the costs depends primarily on how sensitive the market is to changes in price, or its “price elasticity.” If customers are willing and able to stop buying a service when prices increase even a little, then demand is said to be “elastic,” and the majority of the mandated peering fee will be paid by the edge company itself. If, on the other hand, customers generally stick around even when prices rise (i.e., demand is inelastic), they will bear proportionally more of the cost.

In either case, some end users will leave a service entirely because of the higher prices; in those cases, both those users and the edge service lose out on each other’s benefits. This deadweight loss is inherent in a regime that mandates a price higher than what the parties would agree to on their own.

It is difficult to quantify elasticities in a real-world market, but their relative magnitudes are the important point of comparison. Many edge services are ad supported, suggesting that the services themselves could not charge very much without losing customers (and this conjecture is supported by user surveys).⁹ Other recent studies find that demand for video streaming services is inelastic.¹⁰ Amazon recently increased the price of its Prime offering, reflecting a belief that demand is relatively inelastic, but that view may prove incorrect, as it has now seen faltering demand.¹¹ Other analyses of the information and communications technology (ICT) sector as a whole find more mixed results, with elasticities starting high but gradually falling over time.¹² It is fair to say there is no definitive answer for the current price elasticity of demand for Internet services.

Because the mandated fee is essentially an increase in the edge company’s cost of doing business, it will result in an increased price to end users.

It is notable, however, that many proponents of mandating payments from edge companies for broadband infrastructure take inconsistent positions on this point. They are apt to decry edge companies as “dominant” or “monopoly” businesses, which entails a view that edge consumers cannot easily shift away from edge services whose prices rise.¹³ If that projection of inelastic demand were correct, then consumers, not Internet companies, would end up paying the majority of the mandated fees.

It is, therefore, at best incomplete to say that SPP-style policies force “Big Tech” to pay for broadband infrastructure. Instead, mandatory fees on edge services will result in the consumers of those services footing some portion of the bill.

“FAIRNESS” IN CONTEXT

Much rhetoric surrounding the push for edge companies to pay broadband providers has centered on the purported unfairness of the growing traffic load dumped onto broadband networks by content companies. But the framing is critical. It is just as true that ISP customers are pulling content into their home network and paying the ISPs for the right to do this.

Moreover, it is not as though the broadband providers are helpless victims. They can bargain for payment for content delivery just as they do with end-user customers on the other side of the market. They can also use the payments they receive from both sides of the market to upgrade their networks to deliver new waves of content. Indeed, we have seen exactly this in the United States, as ISPs invested a whopping \$86 billion into their networks last year.¹⁴

Moreover, content companies can and do invest directly in network infrastructure themselves using content delivery networks (CDNs), such as Akamai, with points of presence (PoPs) that get data closer to end users before it gets on an ISP's network, thereby reducing the overall burden on broadband networks.¹⁵ Likewise, caching allows the most commonly accessed data (e.g., *Stranger Things* or "Baby Shark Dance") to stay within an ISP's network locally rather than having to be sent afresh, perhaps from across an ocean, every time it's requested.¹⁶ These pieces of Internet infrastructure are largely paid for by edge companies seeking to make sure their customers can get their content rapidly.

In the end, content companies and broadband providers have the same goal: To deliver their products to consumers. Differences in business and market structure are inevitable, but as long as bargaining is permitted, freeloading is unlikely.

On the other side of the network, much high-bandwidth traffic is user generated. This is true both in the sense that content is only transmitted because consumers demand it and that users create much of the Internet's content, such as YouTube videos. Rhetoric that portrays Big Tech as greedy bandwidth hogs whose users would not be hurt by paying for those traffic flows elides the fact that the consumers cause those traffic flows and will face pressure to decrease them if regulations artificially increase their cost.

SENDING-PARTY-PAYS AS PROPOSED AND PRACTICED

South Korea

South Korea's excursion into a sending-party-network-pays (SPNP) regime, starting in 2016, provides practical examples of many of these theoretical ill effects. Under the Korean rules, peering fees are regulated based on the volume of traffic sent to ISPs' customers when they request content.¹⁷ Content providers of a certain size also must meet minimum thresholds for server capacity, uninterrupted connections, and notifications of traffic route changes. Pending proposals would go even further and charge edge companies based on such metrics as how many customers they serve, with the implication (and likely the intent) that big U.S.-based content providers such as Netflix will be the ones to bear the brunt of the policy.¹⁸

The Korean policy framework has led to higher costs for a lower-quality Internet experience. Since the fees effectively penalize high traffic volume, ISPs are disincentivized from positioning themselves downstream of popular content platforms, or they pass those added costs to the content providers. At the same time, edge companies have reduced the quality of certain high-bandwidth traffic, such as 4K video, to minimize costs even as applications in other countries improve in quality.¹⁹ Large foreign content providers, given the option, increasingly choose to either interconnect directly with individual Korean ISPs to avoid the fees incurred by ISPs exchanging traffic, or they simply limit the domestic availability of content and force Korean ISPs to bring it into the country.²⁰ These detours distort the market and reduce the efficiency of traffic flows; they have also made South Korea's network topography less resilient.²¹ According to a

recent Organization for Economic Cooperation and Development (OECD) report, by 2020, South Korea had the highest (and trending upward) average latency in the OECD.²² A WIK-Consult report commissioned by Germany to assess competition in transit and peering markets sums up the overall effects of South Korea's regime: "Market observers report a decline in diversity of online content and expect rising prices for end users for content, as well as lower network infrastructure investments. Quality for end users is declining."²³ Far from increasing network quality and consumer experience, therefore, the South Korean SPP policy has made them worse.

Effects are cascading past the immediate downgrade in quality and experience, as transit costs are falling across Asia due to competition and technological innovation. At the same time, the additional costs imposed by interconnection fees in Korea are stifling innovation and inflating Korean transit prices. According to Telegeography, prices in Seoul over eight times higher than they are in Paris and almost five times higher than in New York.²⁴ In fact, Korea might be the only country in the world whose bandwidth prices are bucking the global downward trend.²⁵

South Korea must also divert considerable resources to the enforcement of its price regulations. Disagreements about the volume of traffic flows and the prices owed for them are now matters for bureaucratic proceedings rather than private negotiations. Following the surge of traffic due to popular Netflix television shows such as *Squid Game* in 2021, South Korean ISP SK Broadband sued Netflix to pay a network usage fee for the increased traffic volume, and Netflix appealed.²⁶ The two remained tied up in court, pouring money and resources into a spat that illustrates the potential risk of connecting networks under current South Korean law. Regulatory uncertainty and the potential for lawsuits make South Korea less appealing to potential international collaborators.

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In another example, Korean ISP Korea Telecom initially hosted Facebook's domestic cache server to provide cheaper and faster access to the content inside. With the advent of the SPP regime, Korea Telecom has been inundated with fees from the traffic sent from its server to other ISPs' customers. In response, Korea Telecom tried to push that added cost to Facebook, which instead disabled the cache server altogether, forcing customers' data to be transmitted through the original, longer route.²⁷

In short, the best real-world example of an SPP policy has resulted in wasting resources without benefits to consumers. The South Korean experiment with SPP is clearly a policy failure.

Europe

The unsuccessful experience of South Korea has not, however, staved off proposals within the European Union, which is rumored to be considering an SPP mandate later this year.²⁸

There have been scattered outbursts of SPP proposals in Europe's past. In 2012, ETNO (European Telecommunications Network Operators), the European Union's telecom lobbying group, pushed for an SPP system similar to Korea's, wherein fees would be mandated based on the volume of traffic sent over an operator's network.²⁹ In other words, the volume of traffic requested by an operator's customers is paid for via the price of that broadband service. EU

electronic communications regulatory body BEREC (Body of European Regulators for Electronic Communications) opposed these requests over fears that such a system would put too much control over traffic in the hands of providers, and ultimately no such system was implemented.³⁰ Most recently, BEREC again has found that a “direct compensation” scheme for broadband providers from content providers is not justified.³¹

Nevertheless, history has begun to repeat itself following recent deployment mandates placed on European ISPs which have, in turn, provoked ISPs’ complaints that they can’t comply with those mandates without reaching more deeply into content companies’ pockets.³² Nearly everyone already has broadband, the argument goes, so revenues can be expected to stagnate. Meanwhile, the costs of necessary upgrades in line with advancing applications, mandates for green connectivity, and the sustained push toward universal deployment at gigabit speeds will be shouldered by providers. But Europe could reduce broadband costs by allowing more ISP consolidation with greater economies of scale. It could and should support broadband rollout in unserved areas through public subsidies, as the United States has done. And, as the Information Technology and Innovation Foundation (ITIF) has written, there is simply no justification for mandating expansion of network capacity to gigabit speeds.³³

But the argument continues that a handful of companies are responsible for the majority of traffic, and they should thus make a fair contribution to the Internet’s infrastructural upkeep and upgrades.³⁴ In fact, it is EU ISPs’ customers that are responsible for the majority of traffic. To take it to absurd levels, if they just stopped watching video, including video calls, traffic would be much less.

Despite this proffered justification, the case for SPP mandates is not meaningfully different from when the SPP idea was proposed and rejected in 2012. In practice, if the idea gains traction, it will be more due to the unpopularity of Big Tech—especially GAFA (Google, Apple, Facebook, and Amazon)—that makes them an easy target for fees rather than a fundamental change in economic conditions. Particularly in a European context, the temptation of levying fees on large foreign content providers to line domestic coffers is politically attractive but otherwise unsupported by logic or scholarly analysis.

European SPP proposals today are analogous to “calling-party-pays” models, the voice telephony model in which the calling party pays for the call through a termination fee paid by the initiating network to its receiver.³⁵ But as an Analysys Mason white paper on interconnection explains, there are two significant divergences between voice telephony and the Internet. First, fixed telephone operators were traditionally monopolies whose interconnection rates were regulated by the International Telecommunication Union (ITU). Internet backbones, meanwhile, evolved out of a competitive environment in which the vast majority of them chose settlement-free interconnection as the most efficient route.³⁶ In fact, a Packet Clearing House Survey conducted in 2016 of over 10,000 networks finds that 99.98 percent of agreements detailed by the respondents were settlement-free.³⁷ This is an overwhelming demonstration of the perceived value of mutually beneficial “handshake” agreements over regulated settlement terms.

The second disjuncture between landline-based calling-party-pays and its successor is that the Internet-based SPP model improperly conflates sending traffic with *initiating and valuing* that traffic.³⁸ Unlike in the days of fixed landlines when the person making the call was the initiator and beneficiary all at once, the main reason people subscribe to the Internet is to be able to

access content from all over the web. It is of course true that content providers rely on and benefit from the entire system, but, given the aforementioned complex market dynamics, even if there is a financial liability to be allocated based on traffic, it is not universally beneficial for the edge company to pay for it.

In fact, the direction of value flows between content providers and ISPs is so ambiguous that content providers made the mirror argument in the early days of the Internet: When content providers were still a relative unknown and couldn't depend on a steady income from user subscriptions, they asked for a portion of ISPs' revenues, arguing that they provided the value for which users subscribed to ISPs.³⁹ This argument was rejected, and it rested on a similar argument as do calls for SPP today. The reality is content helps broadband providers, and broadband providers help content.

In short, the historical development of broadband deployment and the allocation of prices for sending and receiving content has mirrored the two-sided market model. And the folly that model implies for SPP mandates would likely follow European regulators' attempts to regulate peering prices.

If the South Korea case is not clear enough, there are examples of ill effects of indirectly SPP-type arrangements within Europe itself, such as a 2013 dispute over fees between French telecom providers and Google backbone partner Cogent that broadly decreased quality for consumers attempting to use YouTube.⁴⁰

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To be clear, negotiated peering arrangements between ISPs and content providers are legal in Europe under current law, so it is untrue that rate regulation is necessary in order for edge companies to pay their "fair share." The flexibility afforded to negotiate a price—whether that price is zero because of the mutual gains of both parties or a market-driven positive price that coordinates the incentives and benefits involved in the transaction—means the price generally facilitates efficient traffic flows. European opponents of SPP often appear muddled on this point due to an extraneous commitment to a certain conception of "net neutrality."⁴¹ But insofar as one's view of net neutrality also entails price regulation, only with the price set to zero, it is also harmful to the development of efficient Internet traffic markets. Negotiated prices play an important role in the functioning of the Internet, and regulators should not try to control them at artificially high or low levels.

The success of market-based dynamics is currently on display, as the EU's peering marketplace has seen declining prices for content delivery. Technological progress, competition, and challenges from improved peering and CDN services have all been steadily lowering transit prices; since BEREC identified the downward trend in 2017, price decreases have continued, though the rate of change has slowed.⁴² BEREC simultaneously found a steady decline in CDN prices, which has also likely continued, since transit and CDN prices are so closely linked.⁴³ At this point, transit in Europe costs less than a third of what it was in 2015.⁴⁴ Upending this market with price regulations is more likely to produce the consumer harms seen in South Korea than it is to improve network quality.

United States

The United States has a different funding model than do other countries, so a deficit in funding here looks different than it does in Europe. Yet a number of proposals to bulk up funds mirror those in the EU.

In the United States, the Universal Service Fund (USF) is a federal program that is meant to subsidize broadband wherever the cost of deployment or households' inability to afford it would otherwise leave individuals disconnected. USF funds are drawn from fees collected from the sale of telecommunications services. But the total base on which to levy those fees is dwindling as consumers switch from traditional phone service to Internet-based services, which are not subject to USF fees. Thus, the USF contribution factor (essentially a tax rate) has ballooned and sits at around 30 percent as of 2022.⁴⁵

Because the USF contribution factor is a tax in all but name, it is an especially stark example of the incidence model previously described.

The U.S. case is particularly puzzling, since the federal government has recently enacted several programs that have poured tens of billions of dollars into broadband deployment.⁴⁶ This makes it highly unlikely that broadband deployment will be underfunded without additional sources of USF contributions, especially if the National Telecommunications and Information Administration (NTIA) and the states spend the money wisely; in fact, vastly scaling back the USF high-cost fund, if not eliminating it outright, is now the most sensible policy.⁴⁷

Instead, some in the United States have proposed expanding the reach of USF to include edge companies. Indeed, the Federal Communications Commission (FCC) recently asked Congress to give it authority for such an expansion.⁴⁸ Though not structured as a direct price regulation of peering markets, the argument follows a similar pattern as that of international proposals that blame edge providers as beneficiaries of a source of huge amounts of traffic for not contributing enough financially to the networking infrastructure.⁴⁹ Because the USF contribution factor is a tax in all but name, it is an especially stark example of the incidence model previously described. Just as consumers now pay for a portion of the USF fees nominally levied on their telecommunications providers, consumers of edge services will shoulder a share of the fees levied on edge services. The exact elasticities remain unclear, but many substitutes for traditional telecommunications services now exist to an extent not present in at least some segments of the edge services. There is good reason to think, therefore, that a greater share of USF fees would be borne by consumers if they are extended to edge services.

Here, again, the rhetorical position of taxing Big Tech in order to lower taxes on consumers has a superficial appeal that crumbles when examined more closely—and would likely stick consumers with higher costs for lower-quality Internet services.

CONCLUSION

Clearly, fascination with SPP models is spreading internationally. But regulators that seek to impose them should look carefully at the South Korea example—or in Europe's case, its own history. The allure of regulated pricing is a mirage that will give way to consumer harm by distorting the market dynamics that would otherwise coordinate the complex Internet ecosystem.

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