# INTEROPERABILITY: THE WRONG PRESCRIPTION FOR PLATFORM COMPETITION

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## Interoperability: The Wrong Prescription for Platform Competition

*By Jay Ezrielev & Genaro Marquez*


In this paper we assess the potential effects of recent proposals to mandate interoperability as a competition remedy for digital platforms. We find that mandating interoperability for digital platforms may harm competition and innovation. Interoperability standards for digital platforms may reduce differentiation and result in fewer functionality options for users. Interoperability may also weaken platforms' incentives to compete through innovation and pricing. Interoperability may discourage Schumpeterian competition and entrench incumbents. The process of establishing interoperability standards may result in excess inertia as well as inferior technology and design choices for standards. The benefits of interoperability for digital platforms may be relatively small when multihoming costs are low and there is a high degree of differentiation across platforms. We urge caution in adopting policies that would mandate interoperability for digital platforms as such policies may do far more harm than good.

# I. INTRODUCTION

Interoperability is the ability of different systems to work together by exchanging information.[2] Recently, there have been a number of calls for mandating interoperability as a competition remedy for digital platforms.[3] For example, the recent House of Representatives Judiciary Committee's Subcommittee on Antitrust, Commercial, and Administrative Law majority staff report stated that, "in the absence of pro-competitive policies like interoperability, it is also possible that enforcement alone may provide incomplete relief [from deficient digital markets competition] due to future market tipping."[4] Kades and Scott Morton likewise call for mandating interoperability as a remedy for digital platform competition. They argue that "interoperability breaks the power of network effects" where "the network effects would no longer be firm-specific but apply at the market level," thus reducing the importance of size as an advantage for digital platforms.[5]

In this article, we put aside the question of whether there is any need to remedy digital platform competition and focus instead on the competition effects of interoperability. It is important to acknowledge at the outset that interoperability can be very beneficial. Interoperability is what allows different applications to communicate over the Internet. It is what enables users of different applications to share photos, videos, and documents and what allows iPhones to communicate with Android smartphones.

But not all interoperability effects are benign. There are costs as well as benefits to interoperability. The balance between the benefits and costs of interoperability varies across markets, technologies, and business models. Interoperability may lead to higher reliability risks, security breaches, and loss of privacy.[6] The benefits of interoperability may be small when the costs of multihoming (using multiple platforms) are low and there is a high degree of differentiation across platforms. Moreover, as we discuss in this article, interoperability may reduce competition and innovation for digital platforms.

There are several ways in which mandatory interoperability may reduce competition and innovation. An interoperability mandate would force competing digital platforms to agree to common functionality standards, eliminating some aspects of competition and limiting differentiation. Interoperability may also weaken platforms' incentives to compete through innovation and pricing. In addition, interoperability may hinder Schumpeterian competition and entrench incumbents. Establishing interoperability standards would entail a complex process that risks introducing delays in adopting the latest technological advancements and may lead to inferior technological and design choices. The proponents of interoperability argue that interoperability lowers entry barriers and mitigates the negative effects of "tipping" (or capturing the market).[7] A major flaw in this argument is that it rests on the assumption that digital platform markets are particularly prone to tipping. However, these markets are unlikely to tip because, for many types of digital platforms, the costs of multihoming are low, users have heterogeneous preferences, and platforms offer differentiated services. There is also no evidence of widespread tipping among digital platforms.

Overall, we urge caution in requiring interoperability for digital platforms, which may do far more harm than good.

2 Interoperability should be distinguished from data portability, which is the ability to transfer data between systems or applications.

3 See Michael Kades & Fiona Scott Morton, "Interoperability as a Competition Remedy for Digital Networks," *Washington Center for Equitable Growth*, Sept. 2020, https://equitablegrowth.org/wp-content/uploads/2020/09/092320-WP-Interoperability-as-a-competition-remedy-for-digital-networks-Kades-and-Scott-Morton.pdf; Becky Chao & Russ Schulman, "Promoting Platform Interoperability," *New America*, May 13, 2020, https://www.newamerica.org/oti/reports/promoting-platform-interoperability/; Chris Riley, "A Framework for Forward-Looking Tech Competition Policy," *Mozilla*, Sept. 2019, https://blog.mozilla.org/netpolicy/files/2019/09/Mozilla-Competition-Working-Paper.pdf.

4 See Subcommittee on Antitrust, Commercial and Administrative Law of the Committee on the Judiciary, Investigation of Competition in the Digital Marketplace: Majority Staff Report and Recommendations, 116th Cong., 2d sess., 2020, HR Rep. 385 [hereafter House Report].

5 See Kades & Scott Morton, *supra* note 3.

6 See Urs Gasser, "Interoperability in the Digital Ecosystem," July 6, 2015, https://ssrn.com/abstract=2639210; and Wolfgang Kerber & Heike Schweitzer, "Interoperability in the Digital Economy," *JIPITEC* 8, no. 1 (2017), https://www.jipitec.eu/issues/jipitec-8-1-2017/4531/JIPITEC_8_1_2017_Kerber_Schweitzer.pdf.

7 See House Report, *supra* note 4, at 383; Kades & Scott Morton, *supra* note 3, at 7-9.

## II. MULTIHOMING AND DIFFERENTIATION

To assess whether interoperability is the right policy for competition, it is important to consider both the benefits and costs of interoperability. The benefits vary across applications. One key determinant of the benefits of interoperability is the cost of multihoming. Interoperability may be particularly valuable when multihoming is expensive. For example, if Android smartphones could not communicate with iPhones, purchasing and carrying both an Android smartphone and an iPhone to be able to reach most users would be costly and inconvenient. Conversely, interoperability may offer users relatively little benefit if it is inexpensive to use different platforms to connect to different sets of users. For many types of digital platforms, users pay no fees or only pay per-use fees. For example, social media platforms normally do not charge user fees. Passengers only pay a per-use fee for ride-share platforms, making it inexpensive to switch platforms from ride to ride.

Interoperability may be relatively unimportant to users when digital platforms offer differentiated services and multihoming is inexpensive. Multihoming is an attractive option for users when platforms offer highly differentiated services because users may not view such platforms as substitutes. For example, users may find it convenient to stay in touch with friends and family on Facebook and use LinkedIn for work. Given the low multihoming costs and a high degree of differentiation for social media platforms, it is not surprising that multihoming is common for these platforms.[8] According to GlobalWebIndex's 2020 social media flagship report, Internet users in the U.S. hold on average of 7.3 social media accounts.[9]

There are many examples of digital platforms where non-interoperability is the norm, including social media, messaging applications, digital marketplaces, online dating websites, teleconferencing systems, ride-share applications, credit cards, restaurant reservation websites, streaming services, job search engines, and classified advertisements. What these platforms have in common are low costs of multihoming and a relatively high degree of differentiation. The absence of interoperability for these digital platforms may reflect user preferences.

## III. LIMITING THE SCOPE OF DIFFERENTIATION

Differentiation is an important element of competition. Firms differentiate themselves from competitors through products, services, advertising, quality, and pricing strategies.[10] Differentiation enables firms to gain a competitive advantage in serving specific segments of consumers.[11] Consumers benefit from differentiation by having options that are more targeted to their specific preferences.

Mandatory interoperability for platforms may lead to less differentiation and innovation.[12] There is a tradeoff between standardization and variety.[13] Interoperability standards constrain functionality, which may eliminate some aspects of innovation competition.[14] For example, setting a file size limit for data transfers under an interoperability standard would eliminate competition to provide larger file transfers. Without the constraints of interoperability, platforms have more freedom to develop new functionality and experiment with new ways to serve and attract users.

8 See "Online Platforms and Digital Advertising: Market Study Interim Report," *Competition & Markets Authority*, (2019): 93-94, https://assets.publishing.service.gov.uk/media/5dfa0580ed915d0933009761/Interim_report.pdf.

9 See "Social Media Flagship Report", *GlobalWebIndex* (2020): 16, https://www.globalwebindex.com/hubfs/Downloads/Social%20flagship%20report%20Q3%202020%20-%20GlobalWebIndex.pdf.

10 See Peter R. Dickson & James L Ginter, "Market Segmentation, Product Differentiation, and Marketing Strategy," *Journal of Marketing* 51, no. 2 (1987).

11 See Harold Hotelling, "Stability in Competition," *The Economic Journal* 39, no. 153 (Mar. 1929): 41-57; and Avinash K. Dixit & Joseph E. Stiglitz, "Monopolistic Competition and Optimum Product Diversity," *American Economic Review* 67, no. 3 (1977): 297–308.

12 See Gasser, *supra* note 6.

13 See Joseph Farrell & Garth Saloner, "Standardization and Variety," *Economic Letters* 18, no. 1 (1986): 71–74.

14 See Michael L. Katz & Carl Shapiro, "Systems Competition and Network Effects," *Journal of Economic Perspectives* 8, no. 2 (Spring 1994): 93–115; and Stanley M. Besen & Joseph Farrell, "Choosing How to Compete: Strategies and Tactics in Standardization," *Journal of Economic Perspectives* 8, no. 2 (Spring 1994): 117-131, https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.8.2.117.

Messaging systems demonstrate the importance of differentiation and the potential limiting effects of mandated interoperability. Standard texting applications use the SMS (short message service) and MMS (multimedia messaging service) interoperability standards.[15] However, there has also been significant growth in popularity of competing "over-the-top" ("OTT") non-interoperable messaging applications that are not based on the SMS and MMS standards.[16] OTT messaging applications include WhatsApp, Facebook Messenger, iMessage, Telegram, Skype, Signal, Google Chat, WeChat, Viber, Slack, Tencent QQ, Line, Snapchat, Discord, and many others. These messaging applications offer a variety of features not supported by the SMS and MMS standards, such as end-to-end encryption and typing indication.[17] Compelling OTT applications to comply with interoperability standards would have likely deterred the development of highly differentiated services that OTT applications currently offer.[18]

The interoperability proposal from Kades and Scott Morton does not prohibit platforms from offering differentiated features to their users but requires the exchange of "basic" information between platforms.[19] Under this proposal, interaction between users on the same platforms would have features not available for cross-platform interactions. The Kades and Scott Morton proposal would only offer a partial interoperability benefit and attenuated network effects across platforms. If multihoming costs are low (as they are for social media platforms), there may be relatively little demand by users for the type of interoperability that Kades and Scott Morton propose. With low multihoming costs, users may prefer to join a platform to engage with others on the same platform at a full level of functionality rather than engaging with others across platforms at a reduced level of functionality.

## IV. LOSS OF COMPETITION AND INNOVATION

What makes competition between non-interoperable (or incompatible) platforms particularly intense is the presence of positive network externalities (or network effects). Under positive network externalities, increasing the size of the network makes the network more valuable to all of its users.[20] Incompatible platforms have a strong incentive to compete for users because their network size is a source of competitive advantage.[21] Because of network effects (and strong incentives to increase network size), a platform's optimal strategy may be to charge zero prices or even subsidize usage in order to attract more users.[22] Multi-sided platforms may be able to attract users by subsidizing usage on one side of the platform and earning revenues on the other side of the platform, for example, from advertisers on social media platforms or merchants on credit card platforms.[23]

Interoperability across platforms effectively combines the platforms into a single network, allowing the network effects to apply across all the platforms participating in the standard.[24] However, combining platforms into a single interoperability network may weaken the incentives to compete for users because of the diminished private benefits of increasing network size. Without interoperability, a platform reaps the full

15 See "MMS (Multimedia Messaging Service) – definition," GSMArena, accessed April 29, 2021, https://www.gsmarena.com/glossary.php3?term=mms; and "SMS (Short Messaging Service) – definition," GSMArena, accessed April 29, 2021, https://www.gsmarena.com/glossary.php3?term=sms.

16 Jürgen Meffert & Niko Mohr, "Overwhelming OTT: Telcos' growth strategy in a digital world," McKinsey & Company, January 27, 2017, https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/overwhelming-ott-telcos-growth-strategy-in-a-digital-world.

17 See Zak Doffman, "Why You Should Stop Sending SMS Messages - Even On Apple iMessage," *Forbes*, August 8, 2020, https://www.forbes.com/sites/zakdoffman/2020/08/08/apple-iphone-ipad-imessage-security-update-sms-rcs-google-whatsapp-encryption/?sh=2ec24135b4d3.

18 The Rich Communication Services (RCS") standard extends the functionality of the SMS and MMS standards. However, even though the RCS standard was first proposed in 2007, so far, there has been relatively little adoption of the standard by messaging applications. (See Mike Dano, "Verizon, AT&T, T-Mobile kill RCS plans," *LightReading*, April 13, 2021, https://www.lightreading.com/ossbsscx/verizon-atandt-t-mobile-kill-rcs-plans/d/d-id/768729.

19 See Kades & Scott Morton, *supra* note 3, at 23.

20 See Paul David & Shane Greenstein, "The Economics of Compatibility Standards: An Introduction to the Recent Research," *Economics of Innovation and New Technology* 1 (1990): 3–41; and Katz & Shapiro, *supra* note 14.

21 See Michael Katz & Carl Shapiro, "Product Compatibility Choice in a Market with Technological Progress," *Oxford Economic Papers* 38, issue supp. (November 1986): 146-165.

22 See Katz & Shapiro, *supra* note 14.

23 See Jean-Charles Rochet & Jean Tirole, "Platform Competition in Two-Sided Markets," *Journal of the European Economic Association* 1, no. 4 (June 2003): 990-1029, https://academic.oup.com/jeea/article/1/4/990/2280902.

24 Cross-firm network effects may be attenuated to the extent that interoperability is only partial and if firms may retain features that are outside the scope of the interoperability standard.

benefits of investments to increase its network size. A platform may invest in increasing the size of its network by developing new functionality and services, advertising, and low prices.[25] But with interoperability, the benefits of investment to increase network size accrue partially to other platforms because the platforms share the network. Sharing the benefits of investment with other platforms would lead to free-rider effects and would diminish investment incentives.[26]

Interoperability transforms the nature of platform competition from between-network to within-network.[27] This transformation from between-network to within-network competition may have adverse effects.[28] For example, under interoperability, social media platforms would still compete for users, but they may have diminished incentives to develop new content-creation tools because the benefits of that investment would partially accrue to other platforms.[29]

## V. ENTRENCHMENT OF INCUMBENTS

Interoperability may also entrench incumbents by discouraging Schumpeterian competition.[30] Schumpeterian competition occurs when entrants pursue a strategy of disruptive innovation. A successful disruptive innovation strategy may lead to incumbents' products and services becoming obsolete, thereby inducing the incumbents to exit. Interoperability may impede disruptive innovation because of the constraints that interoperability standards would impose on new functionality. Incumbent firms would likely play a key role in crafting interoperability standards, and in doing so, the incumbents may advocate for standards that may deter entrants from pursuing disruptive innovation.

Interoperability also makes it more difficult for entrants to displace incumbents because interoperability mitigates incumbents' losses.[31] Just as interoperability may benefit entrants by giving them access to incumbents' users, it may likewise benefit incumbents by giving them access to users acquired by entrants, including the defectors not satisfied with the incumbents' products and services. Absent interoperability, defections from an incumbent may doom its survival. But with interoperability, the incumbents may persist despite offering obsolete functionality and inferior services because of the benefit of having access to the users on other platforms.[32] Had MySpace agreed to interoperability with other social media platforms, it might still be a significant social media platform.

The proposal from Kades and Scott Morton would make interoperability mandatory for Facebook but optional for entrants.[33] Under this proposal, entrants pursuing a disruptive innovation strategy may forgo interoperability while others could opt for interoperability to mitigate entry risks. Giving entrants the interoperability option amounts to a subsidy not to pursue a disruptive innovation strategy (to the extent that interoperability is valuable for entrants). The interoperability option may deter some entrants from pursuing disruptive innovation and may instead lead them to pursue the less risky interoperability strategy.

25 Platforms increase network size by adding users.

26 See Paul A. Samuelson, "The Theory of Public Expenditure," *Review of Economics and Statistics* 36, no. 4 (1954): 387–389.

27 See Besen & Farrell, *supra* note 14.

28 See Katz & Shapiro, *supra* note 14.

29 Other platforms would benefit from the investments in better content generation because their users would be able to view the content, and the platforms would be able to earn revenues by showing ads to their users.

30 See Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper & Brothers, 1942).

31 See Katz & Shapiro, *supra* note 21.

32 See Jae Nahm, "Open Architecture and R&D Incentives," *The Journal of Industrial Economics* 52, no. 4, (December 2004): 547-568; and Michael Katz & Carl Shapiro, "Product Introduction with Network Externalities," *Journal of Industrial Economics* 40, no. 1 (March 1992): 55–84.

33 Under the Kades and Scott Morton proposal for digital platform interoperability, interoperability would be mandatory for the "dominant" platform but optional all other platforms. See Kades & Scott Morton, *supra* note 3, at 24. ("While participation in the interoperability standard would be mandatory for Facebook, it would be optional for all other platforms.")

## VI. STANDARD SETTING PROCESS

In determining whether mandatory interoperability is the right policy for digital platform competition, it is important for policy-makers to consider the costs of the standard setting process and whether the benefits of interoperability for digital platforms justify these costs.[34] Standard setting organizations have the difficult task of building consensus among participants with divergent views and agendas.[35] Negotiations among parties with divergent agendas may lead to delays in reaching agreement.[36] The standard setting process also brings together competitors to participate in joint design decisions, which can create an opportunity for participants to engage in anticompetitive behavior (despite whatever mechanisms that standard setting organizations put in place to prevent such behavior).

Because of the uncertainty of technological progress and the challenges of reaching agreement among participants with divergent views and agendas, in some cases the standard setting process may result in inferior technological and design choices.[37] Interoperability standards may also lead to excess inertia, where standards lag technological and design advancements.[38] Standards may deter innovation and risk-taking because they represent design by consensus.[39] Firms unencumbered by interoperability standards are free to experiment with new features and services, potentially leading to more innovation.

## VII. ABSENCE OF TIPPING

Another reason to be cautious about mandatory interoperability as a competition remedy is that the arguments in favor of interoperability as a competition remedy have a faulty premise. The proponents of interoperability argue that the presence of network effects in digital platforms makes the platforms prone to tipping.[40] Under this argument, digital platform competition is "for the market" rather than "in the market," and interoperability, therefore, is necessary to allow "in the market" competition to occur.[41]

However, there are a number of reasons why tipping may not occur in digital platform markets. Markets may not tip when users have heterogeneous preferences and firms offer differentiated products and services.[42] Users' preferences for differentiation may outweigh their preferences for larger networks.[43] Thus, multiple incompatible platforms may survive by providing differentiated products and services that cater to users' specific preferences. Tipping may also not occur if multihoming costs are low. Users may be willing to join smaller networks that provide differentiated services and also use a large network if the cost of using multiple networks is low.[44] Past examples of tipping include the adoption of the VHS standard for videocassette recorders and the QWERTY standard for typewriter keyboards.[45] These cases involve relatively high costs of multihoming (purchase of hardware) and relatively low preferences for variety compared to the strength of network effects. In contrast to these

34 The type of interoperability that critics propose to remedy platform competition requires interoperability standards. In particular, Kades and Scott Morton argue that a "technical committee overseen by the antitrust enforcer is the most promising option" for solving the implementation challenges of interoperability. (See Kades & Scott Morton, *supra* note 3, at 3.)

35 See David & Greenstein, *supra* note 20.

36 See Joseph Farrell & Garth Saloner, "Coordination Through Committees and Markets," *RAND Journal of Economics* 19, no. 2 (1988): 235-252.

37 See Katz & Shapiro, *supra* note 14.

38 See Joseph Farrell & Garth Saloner, "Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation," *The American Economic Review* 76, no. 5 (December 1986): 940-955; and David & Greenstein, *supra* note 20.

39 See David & Greenstein, *supra* note 20.

40 See House Report, *supra* note 4, at 383; Kades & Scott Morton, *supra* note 3, at 7-9.

41 *Id.*

42 See Katz & Shapiro, *supra* note 14.

43 *Id.*

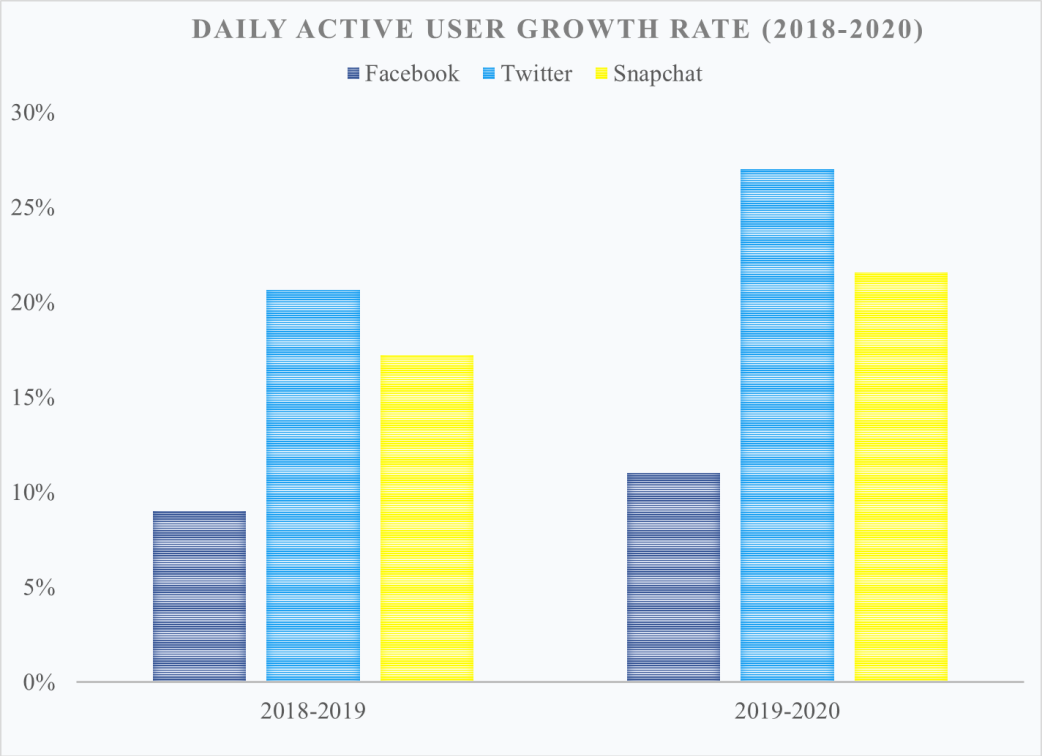
44 Consumers would be willing to join a smaller network if the cost of membership is less than the differentiation benefit of the network. See Bruno Jullien & Wilfried Sand-Zantman, "The Economics of Platforms: A Theory Guide for Competition Policy," *TSE Digital Center Policy Papers series*, no. 1, September 24, 2019, https://ssrn.com/abstract=3502964.

45 See Michael A. Cusumano, Yiorgos Mylonadis, & Richard S. Rosenbloom, "Strategic Maneuvering and Mass-Market Dynamics: The Triumph of VHS over Beta," *The Business History Review* 66, no. 1 (Spring, 1992): 51-94; and Paul A. David, "Clio and the Economics of QWERTY," *American Economic Review* 75, no. 2 (May 1985): 332–37.

cases, digital platforms tend to have relatively low costs of multihoming (no purchase of hardware), heterogeneous user preferences, and a high degree of differentiation. Based on these attributes, there is no reason to assume that digital platforms would be particularly prone to tipping.

There is also no evidence of widespread tipping among digital platforms. Katz and Shapiro define tipping as the "tendency of one system to pull away from its rivals in popularity once it has gained an initial edge."[46] We do not observe such a tendency among digital platforms at a systematic level. On the contrary, users have numerous platform options in social media, messaging systems, digital marketplaces, online dating, teleconferencing, ride-sharing, credit cards, restaurant reservation services, streaming services, job search engines, and classified advertisements. Many digital platforms are thriving despite being significantly smaller than the largest platform in their category.

The proposals for remedying competition through interoperability focus on social media platforms and on Facebook in particular. However, entry and growth of smaller social media platforms belie the notion of tipping toward Facebook. Note the recent success of TikTok. Also note that Twitter and Snapchat have recently achieved significantly higher growth rates than Facebook (in terms of the average number of daily users), even though both of them are significantly smaller than Facebook. These cases show that platforms can achieve high growth despite being much smaller than the leading platforms, contrary to the notion of tipping. Interoperability is not necessary for achieving meaningful competition among digital platforms. Instead, marketplace evidence suggests that entrants and smaller platforms can achieve success through innovation, risk-taking, differentiation, and high-quality services.




Sources:[47] 2019-2020 Facebook, Twitter, and Snap 10-Ks

46 See Katz & Shapiro, *supra* note 14, at 106.

47 Facebook daily active users do not include users on Instagram, WhatsApp, or other Facebook-owned products. The annual growth for Facebook daily active users is based on the December-to-previous-December change in the average daily active users. The annual growth for Twitter and Snapchat daily active users is based on the fourth-quarter-to-previous-fourth-quarter change in the average daily active users.

## VIII. CONCLUSION

We urge caution in adopting policies that would mandate interoperability for digital platforms. Although interoperability can be very beneficial, there are also significant drawbacks in mandating interoperability. In particular, mandated interoperability may reduce competition and hinder innovation. Interoperability standards for digital platforms may lead to less differentiation and less variety of functionality. Rather than enhancing competition, mandated interoperability may hinder Schumpeterian competition and entrench incumbents. The process of establishing interoperability standards may also lead to adverse effects, including excess inertia and inferior technological and design choices for standards. Overall, there is a significant risk that the policy of mandating interoperability for digital platforms may do far more harm than good.

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