April 21, 2021

The Honorable Amy Klobuchar
Chair, Subcommittee on Antitrust, Competition Policy & Consumer Rights
U.S. Senate
425 Dirksen Senate Building
Washington, DC 20510

The Honorable Michael Lee
Ranking Minority Member, Subcommittee on Antitrust, Competition Policy & Consumer Rights
U.S. Senate
361A Russell Senate Office Building
Washington, D.C. 20510

Re: Hearing on Antitrust Applied: Examining Competition in App Stores

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Dear Senators Klobuchar and Lee,

TechFreedom has always believed that dynamism and innovation serve consumers. We write to remind your committee of the enormous value created by app stores and to counsel caution before interfering with what has been an enormous success story for both consumers and developers. Screening every app—and every update to every app—allows app stores to protect the security of users' devices, their privacy, and, indeed, their physical safety against those who might use "stalkerware" apps to track them. Screening also allows app stores to enforce the choices parents have made as to what kinds of apps and media are appropriate for their children. App stores serve society by blocking the sale of illegal drugs and the transmission of Child Sexual Abuse Material (CSAM), terrorist content, and other unlawful material. App stores can also do what the government cannot: block lawful content, such as pornography.

We urge the subcommittee, prior to considering any legislation, to bear in mind the following points: (1) app stores offer enormous benefits for consumers and developers, including protecting privacy and security; (2) the evidence indicates that app store markets are competitive, with output and consumer choices exploding while app store commissions have fallen or remained flat; (3) governmental involvement in these arrangements likely would harm

consumers by reducing the app stores' resources and incentives to protect data security and privacy, and to combat other societal threats; and (4) any legislation should await the conclusion of ongoing antitrust litigation, which will reveal whether existing app store markets are harming competition or consumers (and, if so, whether legislative changes are even necessary).

I. How App Stores Benefit Consumers and Developers

It is easy to take today's app ecosystem for granted, but a brief review of the history of the market illustrates just how much value app stores have created. Apple opened its App Store in 2008, followed just months later by Google's Play Store. These app stores created an entirely new market for mobile device software, and, more generally, revolutionized how consumers found software. App stores helped developers in five notable ways.

First, and most obviously, app stores made the distribution of software dramatically more efficient, cutting out multiple layers of middlemen. Physical distribution of software involved a manufacturer to make the disks, a packager to package them, a retailer or shipping company to distribute them to consumers and manage returns and other billing issues, and often a "publisher" who would interface up and down the distribution chain and who bore responsibility for marketing their products. Every step of the process added costs and ultimately reduced the software company's earnings. In fact, during this period, software developers typically earned, at most, 30-50% of the revenue from each sale.[1] Today, app developers typically retain 70-85% of the revenue from each sale.

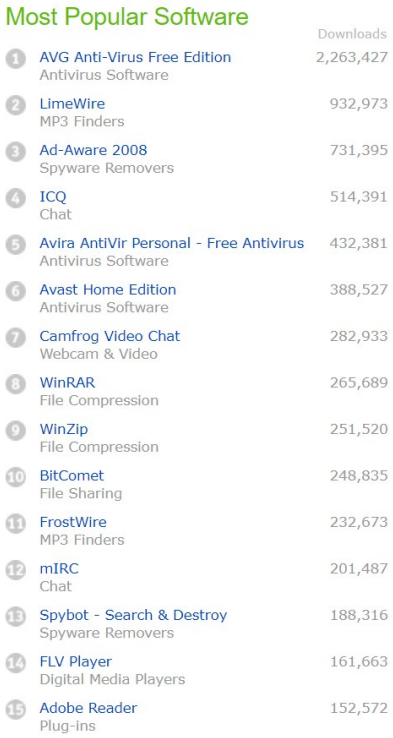
Second and more fundamentally, app stores — as integral parts of new mobile operating systems — created a wholly new market for software on impressively capable mobile devices. While Apple's business model for iOS relied primarily on sales of iPhones, revenue from its App Store was a key part of the company's prescient bet on mobile. Google gives away its Android operating system to OEMs (original equipment manufacturers) that want to make phones using it and did not sell its own Android phones until years later. For Google, revenue from the Play store has always been an important revenue stream for Android.

Third, app stores increased the size of the overall market for downloadable software from a tiny niche to something nearly every American now takes for granted every day. Much of this success was made possible by solving the most fundamental problem in the software market: trust. Any piece of code installed on a device can compromise the security of that device, allowing criminals to gain access to sensitive user data, or even seize control of a device until the user pays a ransom. Antivirus software, installed by consumers on their personal

[1] Letter from the App Association to Rhode Island State General Assembly (Mar. 26, 2021).

computers, has long been available, but offered only a partial solution to the problem: even the best antivirus program could not identify all risks in every piece of software. The market has long attempted to solve this problem by centralizing the screening of software as safe to install. In 2008, a few proto app stores existed for desktop software, most notably Download.com (founded in 1996), whose slogan—"safe, trusted, and spy-ware free"—aptly summarized what even most tech savvy, early adopters were looking for. The site screened software uploaded by developers.

A snapshot of the site on July 11, 2008—the day the iPhone App Store launched—illustrates just what a niche market this was at the time. Only one app had more than a million downloads. Not coincidentally, this was an antivirus program, as were three more of the ten most popular downloads — reflecting the clear failure in the market for cybersecurity. Despite promising users carefully screened software, Download.com struggled with its own cybersecurity: in 2011, the tool it offered users for managing downloads onto their personal computers was itself found to contain malware.[2]



The limited reach of Download.com, then the leading proto app store, illustrates the state of the downloadable software market in 2008, when the vast majority of consumers continued to obtain software on physical disks purchased at bricks-and-mortar retail stores, or perhaps delivered by mail.

In 2010, Microsoft launched its own Windows Phone Store for its Windows Phone operating system, which was ultimately consolidated into a new Windows Store for both desktop and mobile apps launched in conjunction with Windows 10 in 2015.[3] Together, Apple, Google and Microsoft app stores have made it commonplace for tens of millions of Americans to download and use apps. They achieved mass-market success by solving multiple problems, on both the consumer and developer side of the market. First, app stores marked a real sea change in cybersecurity. Prior to the development of app stores, consumers had to update all their software regularly — both to obtain updated functionality and also to "patch" security issues identified in the software. This created two vulnerabilities: (i) running outdated software exposes users to attack from bad actors and (ii) every software update also exposed users to attack. App stores solved

[2] ExtremeTech, *Download.com wraps downloads in bloatware, lies about motivations*, at https://www.extremetech.com/computing/93504-download-com-wraps-downloads-in-bloatware-lies-about-motivations.

[3] The Windows Phone operating system was discontinued the following year.

both problems by allowing developers to regularly post updated versions of each app, screening each update, and pushing that updated version out to consumers, so that it would be installed automatically without need for further action by consumers (unless more tech-savvy consumers opted to decide when to update apps themselves). Today, app stores have achieved a degree of security, and thus user trust, that was previously unfathomable — while also greatly reducing the effort required from consumers.

App stores offered an additional, wholly novel dimension of trust. Previously, every online transaction exposed consumers to credit card fraud, and consumers had no easy recourse when they disputed transactions or wished to cancel a purchase. Today, each app store offers a single, integrated payment mechanism that can be used to purchase all apps and make purchases within them, and app stores will, upon request, refund some purchases.[4] While some customers may remain unsatisfied in some situations, this system is a vast improvement over previously unmediated market for downloadable software, in which consumers had no such recourse.

Fourth, besides expanding the overall size of the app market, app stores have democratized that market, allowing small developers to flourish as never before. Previously, the market was dominated by large, well-established software developers, whose reputation assured consumers that their products could be trusted not to contain malware and the company could be trusted with their credit card information. One study found that, in 2008, 71% of software downloads cost more than $25.[5] It was exceedingly difficult for small developers to achieve distribution for their products, and, given the limited scale of the market, few of the small, inexpensive apps that dominate today's app stores could survive. As *Wired* noted a year after the launch of the Apple App Store, "its method is proving far more effective than the old-fashioned computer shareware model, where developers would offer a free trial of their apps and then cross their fingers that consumers would eventually pay. The shareware model especially didn't help independent coders, whose apps got trampled on by large software companies with fatter marketing budgets."[6] As a result, app stores radically expanded the market for in-app purchases.

[4]https://support.apple.com/en-us/HT204084; https://support.google.com/googleplay/answer/2479637?hl=en

[5] https://successfulsoftware.net/2009/04/23/the-truth-about-conversion-ratios-for-software/

[6] https://www.wired.com/2009/06/dayintech-0629/?utm_source=WIR_REG_GATE

II. How Much "Gatekeeper" Power Do Leading App Stores Really Have?

The critics of leading app stores have alleged that they exert anti-competitive "gatekeeper" power, and have thus proposed either forcing them to open their marketplaces to outside apps, app stores or payment mechanisms, or capping the percentage of revenue they earn from purchases. But if app store owners really exerted such extraordinary power, the revenue-sharing models of Apple and Google would reflect supra-market monopoly pricing — and their share of revenue would tend to rise, rather than fall, over time.

When Apple and Google launched their app stores in 2008, they had no market power. (After all, the market at issue did not exist — they invented it.) They both set their commissions at 30% — higher than the 8-12% charged by Download.com.[7] But, as we have seen, they also offered developers the potential of a vastly larger market — and succeeded wildly in delivering that market by investing in their mobile operating systems and building consumer trust in their app stores. Download.com offered only a fraction of the functionality of today's app stores: less effective screening for cybersecurity, limited, if any, screening for privacy, child protection and other issues; no automatic updating; no developer tools; and, most obviously, Download.com did not have to fund the development of any operating system. Thus, it is not surprising that Download.com's commission was a fraction of today's app stores.

Neither Apple nor Google has since raised its standard commission. Just the opposite: the revenue-sharing models for the top three app stores have evolved only to the benefit of developers. Last year, Apple reduced its commission to 15% for the first $1,000,000 in annual revenue for each developer.[8] Last month, Google followed suit, noting that this would halve commissions paid by "99% of developers globally that sell digital goods and services with Play."[9] Apple also introduced the "reader rule," which allows apps that use digital content or subscriptions purchased outside the App Store to pay zero commissions. Most recently, Microsoft has announced that a new version of its store will allow developers to use their own payment mechanisms for in-app purchases — avoiding Microsoft's revenue commission.[10]

If Google and Amazon were actually engaging in monopoly pricing, they would likely charge fees, so that free apps would have to pay something; instead, they charge only commissions on purchases. Moreover, the commissions they charge would be markedly higher than those charged by competing app stores. This would especially be true of Google, since Android

[7] https://web.archive.org/web/20071021021545/http://www.upload.com/1200-21_5-5081541.html

[8] https://developer.apple.com/app-store/small-business-program/

[9] https://android-developers.googleblog.com/2021/03/boosting-dev-success.html

[10] https://www.cnet.com/news/microsoft-is-reportedly-working-on-new-windows-10-store-app/

users can sideload, with relative ease, competing app stores while iOS users cannot. Yet market data suggests little reason for concern: Amazon's Appstore, the #4 app store as measured by number of available apps (459,167, only slightly behind the Windows Store's 669,000[11]) charges exactly the same 30% commission that Google and Apple have long charged — for both purchases of apps and also in-app purchases.[12] Unlike the market leaders, Amazon has yet to lower its commissions. Aptoide, the #5 app store measured by total downloads, should have an even stronger incentive to compete with the larger app stores by attracting developers by offering them a higher percentage of revenues — yet Aptoide charges a 25% commission.[13] This is only, in relative terms, one-sixth lower than the 30% commission charged by Google, Apple and Amazon. Aptoide's 25% commission is actually markedly higher than the 15% commission Apple and Google now charge small developers. Furthermore, in the Chinese market, where Google Play is not available but Android must nonetheless compete with the iOS China App Store, the commissions charged by alternative Android app stores often go as high as 50%.[14] In short, when compared with alternatives, the commissions charged by the largest app stores do not seem unusually high — suggesting that they do not have the gatekeeper power often alleged.

If anything, the supposed "gatekeeper" power of app stores is declining because of technological change. In the early years of app stores, "native" mobile apps offered significant advantages over reaching users through the web browser. But starting in 2015, a new generation of "progressive web applications" (PWAs) began to close the gap significantly. Today, PWAs are in many ways superior to native apps: most notably, while native apps must be designed separately for each platform, potentially doubling development costs, PWAs are designed to work with standard features available in all the leading browsers and are thus cheaper to develop. Critically, Apple began allowing PWAs in its mobile Safari browser in 2018.[15] Leading publishers, such as Twitter, Forbes, the Financial Times, the Washington Post, and AliExpress, offer PWAs so elegant that they are largely indistinguishable from native apps.[16]

The desktop has seen a similar trend. When Microsoft launched Windows 10 in 2015, the Microsoft Store was the only way to install UWP (Universal Windows Platform) apps. But in

[11] https://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/

[12] https://developer.amazon.com/support/legal/da

[13] https://en.aptoide.com/company/developers

[14] https://inc42.com/features/the-many-sides-of-google-play-stores-30-commission-indias-search-for-alternatives

[15] https://medium.com/@firt/progressive-web-apps-on-ios-are-here-d00430dee3a7

[16] https://mofluid.com/blog/10-best-progressive-web-apps/

2019, Microsoft began allowing users to change their settings to allow them to sideload UWP apps.[17] Thus, developers can now reach users directly, just as they could prior to the advent of online app stores, without having to pay any commissions to app stores.

III. Direct Threats to Privacy, Security & Child Protection

Multiple states are considering legislation that would regulate app stores — and these bills will no doubt inform the deliberations of your committee about federal legislation. While these state bills vary significantly, they generally include bans on three kinds of exclusivity, two of which are relevant here. Specifically, these bills would:

1. Require that users can install apps they download from the web, outside of an app store.[18]

2. Require OS makers to allow the installation of third-party app stores. Android and Windows can already sideload such app stores, but iOS users cannot.

The operating systems offered by Apple, Google and Microsoft cannot pre-screen apps downloaded outside their stores. Those risks are profound:

- Malware apps can compromise the security of their devices. Criminals could gain access to sensitive user data, or even seize control of a device until the user paid a ransom. Without verification by a trusted third party, this could happen with fake versions of apps consumers think they recognize, such as what appears to be the Netflix app.[19]
- Stalkerware apps are banned in app stores but can be installed on Android and Windows devices by anyone who has access to the device, even briefly; such apps can then be used to monitor their activities and even physical location without the owner's consent or knowledge. This could have literally fatal consequences, especially for people (generally women) in abusive relationships. Less tech-savvy users, especially older users, could be duped into installing either malware or stalkerware, even in scams conducted over the phone.

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[17] Hanson, *You Won't Need to Use the Microsoft Store to Install Windows 10 Apps in the Future* (May 10, 2019), at https://www.techradar.com/news/you-wont-need-to-use-the-microsoft-store-to-install-windows-10-apps-in-the-future; Wikipedia, List of mobile app distribution platforms (last visited April 20, 2021), at https://en.wikipedia.org/wiki/List_of_mobile_app_distribution_platforms#Third-party_platforms.

[18] Under a proposed bill in Rhode Island, an OS maker may not "[r]equire a developer to use a digital application distribution platform or digital transaction platform as the exclusive mode of distributing a digital product." H.B. 6055, at http://webserver.rilin.state.ri.us/BillText21/HouseText21/H6055.pdf.

[19] https://www.securityweek.com/fake-netflix-app-takes-control-android-devices

- App stores play a critical role in enabling parental controls: sideloading can enable minors, who may be more tech-savvy than their parents, to bypass parental controls and install apps their parents would not want them to use, including pornography and apps that may be used by adults to groom minors for sexual exploitation. Parental controls are even more important on mobile devices than on desktop computers because it is more difficult for parents to supervise their use, and because they can be used to track the physical location of children.
- App stores screen for various forms of unlawful and harmful content, such as sale of illegal drugs, terrorist content, and child sexual abuse material (CSAM) — protecting individual users as well as society at large from these social harms.

For users who want the ability to sideload apps, Google already offers them the freedom to take such risks. For those users — and enterprises — who prefer to avoid such risks, for themselves and their families, Apple's iOS devices offer a more secure, but restrictive, alternative. Both makers of operating systems for personal computers, Microsoft's Windows and Apple's MacOS, allow users to download software from app stores, but also to install software downloaded from the Internet. This diversity in cybersecurity is simply the market at work. It makes sense that mobile devices are more restricted: they are less capable of screening downloads through local antivirus software, and the risks involved are more significant.

Apple's prohibition on sideloading serves users in other, less obvious ways. Apple screens apps to assess how they drain the user's battery. Over time, processing-intensive apps may actually reduce total battery life. While Google and Microsoft rely primarily on third parties to manufacture the devices that use their products, Apple offers uniquely seamless integration, making all its own devices and taking complete responsibility for servicing them. Ultimately, it is Apple that must field complaints from users about the performance of their phones and Apple that must decide when to replace them. Requiring Apple to allow users to install unverified apps will necessarily change how it prices its devices or its service plans, or the terms under which devices may be serviced or replaced without additional charges. The same goes for Google and Microsoft to the extent they make, and service, their own devices.

Today, Android, Windows and MacOS users easily can enable sideloading, find any third-party app store through a simple web search, install the store with little hassle, and then use that store to install any app they want.[20] But third-party app stores present exactly the same risks to users as sideloading—unless apps are carefully screened, as Amazon attempts to do for its own Appstore for Android.

[20] https://www.intego.com/mac-security-blog/how-to-install-applications-on-your-mac/

Requiring OS makers to include third-party app stores in their app stores, or pre-installed on their devices, would inevitably embroil regulators in thorny questions of which app stores should qualify for such mandated carriage. Regulators would be in the perverse position of *lowering*, rather than raising, the bar for cybersecurity, privacy, and child protection. These vital issues should be left to market forces.

IV. How Disrupting App Stores' Business Models Will Harm Consumers

Multiple state bills would ban a third kind of exclusivity, requiring app stores to allow app developers to use a payment system of their choosing for purchases (of paid apps and for subsequent purchases made in-app). All three of the proposed limitations on exclusivity, but especially the third, would directly undermine the business model that supports the app stores and the operating systems into which they are integrated. From the perspective of app stores, this would be equivalent to setting a price of zero for using their app store, or developing for their operating system. Attacking the business model behind app stores, whether through such limitations upon exclusivity or through direct price controls that dictate revenue splits, would ultimately harm users in multiple ways.

First, undermining the business model for app stores will necessarily undermine their ability to protect consumers. They incur significant costs to review apps. The typical app is updated roughly twice a month,[21] which means that the app store must conduct, roughly 24 times as many reviews each year as it offers apps. GetJar, the #6 app store, charges developers no commission at all, and instead earns revenue by allowing developers to pay to feature their apps, but GetJar also does markedly less screening than other app stores — if any.[22]

In addition to engineering artificial intelligence used for automated screening, Google employs over a thousand reviewers focused just on the Play Store.[23] The challenge of screening apps mounts steadily. In 2019, Google noted that, the previous year, "the number of rejected app submissions increased by more than 55 percent," and the company "increased app suspensions by more than 66 percent."[24]

It is important to note that app stores fund their overall functionality through the commissions they earn on only a small fraction of apps. Currently, 96.7% of Android apps and 92.9%

[21] https://savvyapps.com/blog/how-often-should-you-update-your-app

[22] https://www.makeuseof.com/tag/getjar-thousands-free-apps-mobile-phone/

[23] https://kstatic.googleusercontent.com/files/de5640816a4d4099f246b64864c038fee1eac9a9e944b3f31e993e9a315d9f49aa813f27b92be0fe1070f52975476b8fa15529cc2ec314bebcde73f91331f77e, at 30.

[24] Id.

of iOS apps are free (data are not readily available on the percentage of free apps that charge for in-app purchases of additional features or content).[25] These apps receive the same benefits from the app store — screening, developer tools, a larger market, etc. — even if they do not generate purchase revenues for the app stores. Cutting app store revenue will most harm apps that do not generate revenue. App stores will likely begin to charge them fees or treat them differently.

Second, app store revenue funds the ongoing development of the app stores themselves, as well as the operating systems they are connected with. Capping revenue, or allowing developers to avoid revenue sharing, would reduce the incentive that platforms have to create, maintain, and improve these marketplaces. Perversely, potential competitors could be discouraged from developing their own app stores. App store platforms may take longer to approve new apps or to correct security flaws, thereby directly harming consumers.

Third, app store revenue allows platforms to provide developers with a variety of app development tools, including software development kits, compilers, programming languages, libraries, application programming interfaces, and app analytics. Such tools were not previously provided by proto app stores like Download.com. They can significantly lower development costs, especially for small developers.

Finally, app store revenues reduce the price that consumers would otherwise pay for devices. This is true for both Apple and Google. If Apple earns less revenue from its App Store, it will charge more for its phones (already more expensive than Android options). App store revenue is even more important for Google as the primary revenue stream for its Android operating system — half the revenue Google earns from Android overall.[26] Google does not charge any licensing fees to device makers for using Android. Allowing apps to avoid paying a commission to Google would force the company to charge device manufacturers and mobile carriers more for using Android; alternately, or in addition, Google could charge OEMs more for pre-installing a bundle of the most popular Google apps, including the Play app store (currently up to $40/device). In both cases, if app makers pay less, end users will simply have to pay more for their phones. Indeed, data suggests that Google's relatively inexpensive smartphones are particularly important in minority communities.[27] Accordingly,

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[25] See https://www.statista.com/statistics/263797/number-of-applications-for-mobile-phones/#:~:text=Free%20and%20paid%20app%20distribution%20for%20Android%20and%20iOS%202021&text=As%20of%20March%202021%2C%2096.7,of%20iOS%20apps%20were%20free.

[26] https://www.kamilfranek.com/how-google-makes-money-from-android/

[27] Joint Center for Political and Economic Studies, *For Communities of Color, Increased Smartphone Costs Mean Decreased Opportunity* (July 20, 2018), at https://jointcenter.org/for-communities-of-color-increased-smartphone-costs-mean-decreased-opportunity/.

governmental interference in these private contracts actually could result in higher upfront costs for consumers.

V. General Problems with Price Controls

Two general points must be made about price controls. First, price controls inevitably backfire: As one economist explained decades ago, "Almost every piece of price-fixing legislation produces results opposite to those intended."[28] Indeed, history is replete with examples of price controls that led to shortages, harmed consumers, and ultimately destroyed certain marketplaces entirely.

Second, any intervention likely would signal only the beginning, not the end, of Congress's efforts to micromanage these private contracts. As one economist explained, "the aggravation caused by the initial legislation generates further clamor for bigger governmental programs and stiffer Federal controls."[29] Another economist "struggled to find an example" where the removal of price controls has gone smoothly.[30] If Congress intervenes in favor of one side or another, it can rest assured that the winning side will return with higher demands in the near future, and that the losing side will not easily wave the white flag. This would not be a one-time fix.

VI. Congress Should Await Resolution of Ongoing Antitrust Litigation

As a general matter, existing antitrust laws are flexible enough to address any competitive concerns in the digital economy, including in app stores. In 2007, after three years of study, the bipartisan Antitrust Modernization Commission (AMC) endorsed the nation's existing antitrust laws. According to the AMC's chairwoman, Deborah Garza, "there was broad consensus that the economic principles on which antitrust is based do not require revision."[31] Most economists and antitrust scholars agree with this analysis.[32]

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[28] D.T. Armentano, *The Economics of Price Fixing*, Foundation for Economic Education (June 1, 1967), at https://fee.org/articles/the-economics-of-price-fixing/.

[29] *See* Armentano, *supra* at 4.

[30] The Economist, *Why Price Controls Are So Uncontrollably Persistent* (Jan. 11, 2020), at https://www.economist.com/finance-and-economics/2020/01/09/why-price-controls-are-so-uncontrollably-persistent.

[31] AMC Report, at https://govinfo.library.unt.edu/amc/report_recommendation/toc.htm. Garza, Comments Submitted to the U.S. H.R. Comm. on the Judiciary Subcomm. on Antitrust, Commercial, and Administrative Law (April 20, 2020).

[32] Agarwal, *Will the Antitrust Hearing Make Antitrust Great Again?* (July 20, 2020), at https://townhall.com/columnists/asheeshagarwal/2020/07/31/will-the-antitrust-hearing-make-antitrust-great-again-n2573488.

Indeed, even as Congress examines app store markets, the courts are considering a significant lawsuit that will shed light on whether existing app store contracts are harming consumers and the principle of competition generally. In *Epic Games v. Apple*, Epic Games, a very successful software developer, alleges that some of Apple's app store policies violate the antitrust laws and harm consumers. That case raises precisely the issues that are being debated today: notably, app store exclusivity and revenue sharing.

Any congressional action should await the results of this lawsuit. Should Epic Games prevail, its victory will show that existing antitrust law provides a remedy for competitive concerns about app store marketplaces. Should Apple prevail, and the courts find no anticompetitive harm, its victory would undercut the need for legislation. Congress should consider legislation only if the courts find that app store markets are suffering from a lack of competition, or otherwise harming consumer welfare, *and* that existing antitrust laws cannot provide an adequate remedy. Consistent with basic principles of antitrust law, Congress should enact legislation only if there is evidence that app stores are reducing consumer welfare, rather than because individual companies are earning less revenue than they would like — as is the case for every company in every industry.

VII. Conclusion

App stores play a vital role in protecting the data, privacy, and security of consumers. The evidence suggests that app store markets are very competitive, with flat or declining commissions and exploding output. If there are competitive problems in these markets that current law cannot address, the courts will tell us soon enough — and only at that point should the subcommittee consider legislation regarding app stores.