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# ACCESS PRICING FOR APP STORES UNDER THE DMA\*

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## ABSTRACT

This article addresses the fees that Apple and Google might charge business users in their respective mobile ecosystems that would be compliant under the Digital Markets Act (DMA) with a focus on third-party app store access fees. The paper analyses the economic principles behind the DMA's goals of contestability and fairness, particularly in relation to Apple's App Store. It argues that while Apple may charge a fixed fee to review third-party app stores or apps ('Review Fee'), the Access Fee for third-party app stores on iOS should be zero to comply with the DMA. This is because non-zero Access Fees hinder competition from alternative app stores. The paper also explains the strategic impact of fees on app developers when they are conditioned on using rival distribution channels; these can block entry and harm market fairness. We recommend a fee structure for Apple's App Store that includes a zero Access Fee and a reasonable Review Fee. Other aspects of Apple's ecosystem would continue to be monetizable. The article concludes that opening the app store market under these guidelines would promote innovation and competition, consistent with the DMA's objectives.

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\* The author group has met weekly for several years and discussed the issues in this article over many months. It is difficult to isolate specific contributions from individuals because each person's view has been shaped by learning from other authors over time. The authors are listed in alphabetical order. The authors' affiliations and addresses are as follows.

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## I. INTRODUCTION

This article concerns itself with fees that Apple and Google might charge to business users that run third-party app stores in their mobile ecosystems. The article lays out the economic analysis behind the goals of the DMA—contestability and fairness—as they apply to rival app stores. We particularly focus on the access fees for alternatives to Apple’s app store, as this has become contentious in the early enforcement of the DMA. Much of our analysis, however, also applies to Google and/or any other designated gatekeeper.

This paper makes several foundational points. First, the DMA permits Apple to charge a fixed fee to review the security of third-party app stores or apps distributed through and operated on Apple’s operating system (‘Review Fee’). The level of such a fee should be related to the cost of the review function for the reasons we describe below. Generally, because the cost of conducting a review is independent of the revenue an app generates, so too should be the Review Fee collected to cover that cost.

Second, there are many fees that apply to different elements of the Apple ecosystem (for example, the cost of a handset, advertising in the app store, and so forth) that are unaffected by the DMA. However, we show that one element of this complex fee structure—the fees Apple places on third-party app stores for the right to reside on iOS (‘Access Fee’)—is constrained to zero under the DMA. We explain why setting this one fee, the Access Fee for rival app stores, to zero is required for compliance with the DMA and why this restriction is proportionate. In brief, because third-party app stores are potential competitors to Apple’s ecosystem, nonzero Access Fees would block contestability, making them very harmful. Meanwhile, any financial harm to the gatekeeper that might result from setting this fee at zero is limited because of the freedom the gatekeeper has to monetize its ecosystem in other ways that are compliant with European law, including by selling devices, advertising, and other services.

Third, fees imposed on one category of business users may have implications with respect to fairness and contestability for a wholly separate category of business users. The regulator must remain alert for these ‘adjacent’ anticompetitive effects. Of particular relevance here, a fee Apple imposes on app developers only if those developers distribute through a rival app store imposes a direct cost on those developers, but it also undermines fairness and contestability in the app store market. By punishing app developers for using an alternative distribution channel, the fee suppresses app developers’ use of those new channels, depriving the new channels both of revenue from the app developers (which is unfair) and the benefits that would accrue from network effects that would make them more attractive to end users (which also undermines contestability).

On 25 March 2024, the Commission opened an investigation against Apple in regard to its new terms for business users and found the gatekeeper in breach of the DMA on 22 April 2025 (European Commission, 2025a). The Commission continues to investigate Apple for noncompliance in regard to its fee structure for alternative app stores (European Commission, 2024a). Our final point is that if the Commission finds noncompliance under Article 29, it can proceed to specify what Apple should do by using the procedure in Article 8(2). In particular, we recommend that the Commission use Article 8(2) to specify an Access Fee of zero to rival distribution channels, including third-party app stores, allow a positive Review Fee, and let Apple freely price other elements of the ecosystem such as advertising and handsets (consistent with the law). Opening the app store market without delay is necessary to obtain the innovation and entry by business users that is the purpose of the DMA. This solution is simple and proportionate and can be supported with the materials and evidence gathered thus far.

It is theoretically possible that our proposal is the unique compliant fee structure; in other words, it is possible that there are no fees Apple could impose on third-party app stores that are unrelated to its market power and therefore are not Access Fees. Certainly, any other lawful fee

charged by Apple would need to advance contestability and fairness, and fees for advertising or reviewing apps may fall in this category. It is beyond the scope of the current paper to prove our recommendation is the only possible solution. We note that other operating systems set a zero access fee for rival stores.<sup>1</sup>

Finally, we demonstrate how to use economic principles to inform the Commission's determination of whether a gatekeeper's fee structures applicable to the app and app store ecosystems comply with the DMA's requirements. Based on analogs to the telecommunications industry, the policy community may believe a compliant Access Fee should be based on the well-known efficient component pricing rule (ECPR). We explain why this is unlikely to be a helpful pathway in the case of digital platforms, and that economic analysis supports a zero Access Fee in the case of third-party app stores.

The paper is structured in the following manner. An overview of the regulatory framework, its function and its policy goals as well as Apple's fees are set out in Section 2. The fairness and contestability effects of our proposal are discussed in Section 3. Section 4 discusses how the Commission could specify our proposed zero Access Fee and considers tradeoffs to doing so. Section 5 considers recent literature on Access Fees and reviews recent attempts to update the ECPR, which could serve as an alternative to our proposal; we show why this is not a useful approach. We conclude by recalling that a gatekeeper may well find another Access Fee to the one proposed that is also compliant, but it has the burden of showing why any access fee greater than zero is fair and stimulates contestability.

## II. THE REGULATORY FRAMEWORK

### A. Innovation

Before we begin our analysis, we provide some context. First, we acknowledge that the digital gatekeepers regulated by the DMA have been, and continue to be, innovative firms. The digital revolution of the last 30 years has created enormous benefits in enabling faster, better, and cheaper communications, and in allowing the distribution of cultural content, automation, improvement in productivity, and so forth. The gatekeepers regulated under the DMA have often contributed positively to these changes. At the same time, they create novel societal challenges as economic agents use and respond to these new tools. The process of initiating and experimenting with regulation and improving it over time is part of the response to those challenges.

Second, an economy and its citizens benefit when law-abiding firms or individuals that develop new technologies benefit financially from their innovative effort. This is important both as a matter of fairness and as a matter of economic incentives. The alignment of private incentives and public interest is critical in designing such policies, and regulation can play an important role in furthering this objective. This idea is not new and is not limited to the digital economy. At the same time, law and regulation have often put limits on the proportion of the social benefits generated by their innovation that is allocated to inventors: patents and copyrights are limited in length and in the scope of the protection that they afford; regulation and competition law limit the strategies and prices chosen by even the most innovative firms. In the case of the DMA, its regulations apply to very few companies, those designated gatekeepers under the law. Doing so helps to keep these markets fair and contestable, which allows entry of the next generation of innovative firms to reap rewards in their turn.

In the context of the digital gatekeepers, the rewards for innovation do not result solely or even mainly from innovations that intellectual property (IP) protections reward. Rather, the underlying technology, network effects, and the role of data create a very strong 'first mover advantage.' By giving the winner all the rents even when rivals are close behind, the

<sup>1</sup> To the best of our knowledge, Google Android and Microsoft do not charge fees to rival stores.

platform economy overly rewards the first mover. The distribution of rents does not match the contribution of value when the benefits stemming from the platform are not caused solely by the activity of its owner, but also by (a) the coordination of the users around that platform and (b) the activities of these users (Crémer et al., 2023). This raises new issues that have, among other consequences, implications for the regulator's enforcement of rules regarding appropriate Access Fees.

There has been a long lag between the realization that digital regulation was needed, the building of the necessary institutional capacity to regulate, and the start of the enforcement process. The enforcement efforts now underway were launched many years after the market power described above was established. Given how long it has had to wait, society properly expects quick results from the application of the DMA. Urgency is also justified by the importance of freeing up innovation in digital technologies. The fast pace of those technologies creates a risk that slow-moving regulation becomes irrelevant. Regulation is needed quickly to protect existing business users from harm as well as to incentivize them and new entrants to create innovations that benefit society. Of course, policy makers need to be careful not to dampen the incentives for subsequent innovations by gatekeepers themselves or the incentives for new entrants on the market to dislodge the incumbents. We believe that our analysis puts forward a regulatory framework that affirmatively improves incentives for innovation.

### B. Benefits from Competition in App Stores

The DMA's requirement that Apple and Google offer their users the choice of using alternative app stores reflects the importance of such stores for driving quality and innovation. In recent years, the number of apps users have been installing on their handsets has declined from a peak during the beginning of the pandemic in 2020 (Wylie, 2024). This is the case despite the increasing number of applications of all kinds that make a handset more useful. Among the reasons for this decline could be the low quality of the discovery process and the lack of innovation in distribution. All apps are distributed through one of two large monopoly stores<sup>2</sup> that have limited functionality; finding an app involves searching through millions of apps using the store's search function; the resulting recommendations are themselves distorted by advertising; and the store is not tailored to the needs of particular apps or users.

Innovation and store variety would improve the experiences of both consumers and business users. Rival app stores could provide value in curation and search by carrying only a subset of apps and offering users a different value proposition. Rival stores could be run by a large corporation with a particular business model, such as Disney in curation of apps for children, Pinterest in curation of apps for creativity, or American Express in distribution of apps for frequent travellers. New models of stores could spring up, such as a store that would offer a discount for subscription to multiple online newspapers, or a store run by a government with helpful apps for its citizens. Rival stores could also compete simply by charging lower fees to developers. Those lower fees would raise the returns to developers, encouraging more to enter and invest, and thereby increasing variety and choice for end users.

Users might want to make a nonlegacy store their default while multihoming across others, or they might want to single-home on a rival store that offers higher security or a lower carbon footprint. Parents may wish to give their children access to only a child-centred store, for instance. All these options represent innovation, which is an important objective of the DMA, and one that European legislators feared was being harmed by incumbent gatekeepers.

<sup>2</sup> Apple's App Store is a monopoly and Google's Play Store a quasi-monopoly on the ecosystem they serve (In re Google Play Store Antitrust Litigation, n.d.). The EU has designated Apple to be a gatekeeper with respect to the App Store (Summary of Commission, n.d.). In addition, the CMA's 2022 Market Study concluded that Apple and Google had a duopoly in mobile ecosystems and 'significant and entrenched market power' in their respective app stores (Competition and Markets Authority, 2022). For illustrations of the market distortions consequent to this power, see Teh and Wright (2024) and Jeon and Rey (2024).

Effective access to third-party stores will increase contestability on the platform (we previously have called this competition *in* the market) with resulting improvements in price, quality, and innovation for both sides of the platform (3, pp. 994–995). The platform itself will also face competitive pressures to improve its own store, benefiting even users who do not download additional stores.

The second reason that competition in app stores is crucial is because such stores represent potential future competition for a mobile operating system [we previously have called this competition *for* the market (Crémer et al., 2023)]. As described in the DOJ’s recent antitrust complaint against Apple, app stores are a type of ‘super app,’ which can function as middleware (Compl., U.S. v. Apple, 2023). Middleware lowers users’ switching costs across operating systems because it functions on both the incumbent and rival operating systems. Users can adopt the rival operating system (OS), log in to the middleware, and immediately access entitlements, identities, and functionalities they expect. This promotes entry of rival operating systems because lower switching costs makes obtaining customers much easier. Super-apps will be part of robust competition in app stores, and in this way increase contestability in operating systems. Effective access to third-party stores therefore will increase contestability for the platform itself, which will in turn benefit both business users and end users as they will have more distribution choices. This theory lies behind the 2021 lawsuit against Google brought by a coalition of State Attorneys General. The complaint described how Google prevented rival stores from competing with the Play Store despite their presence on certain Android phones. Tactics included direct payments, pressure on developers, and required agreements with original equipment manufacturers (OEMs) (Complaint, 2021).

While there are many instruments with which a powerful gatekeeper can extract profit from end users and business users, not all of them are critical to entry and contestability in the digital economy. Protection of rival app stores is an appropriate focus for regulation if innovation, entry, and contestability are goals.

### C. The Size of the App Store Business

App store fees are a significant portion of the business of the two gatekeepers. Since 2023, Apple services generated about \$85 billion dollars, or about a quarter of the revenue generated by the sales of hardware (Apple Sales and Profits Analysis for FY 2023—Top 10 Insights, n.d.). Apple does not break out the components of its services revenue, perhaps because the category contains a very large payment from Google for the exclusive default position at all search access points on the iPhone. We know from the Google search antitrust trial in the United States that this payment is about US\$20B annually, or 24 percent of the Apple’s service category revenue. Other services in the category include advertising in the App Store, the margin on top of the credit card fee that Apple charges for Apple Pay, subscriptions for storage, AppleCare, Apple Music, and the like. It nonetheless seems likely that the single largest source of revenue in the Services category is the percentage fee from digital sales in the Apple App Store.

We can also obtain an estimate using reported App Store revenues. Apple since 2023 reported \$89.3 billion in consumer spending on the Apple App Store. Of this spending, Apple took either a 30 percent cut or a 15 percent cut (for members of the Small Business Program). Although precise data are not available, a 2020 analysis of gaming revenue on the App Store (which comprises a little over half of total App Store revenue) found that only 2 percent of revenue came from businesses that would qualify for the program (Chapple, 2020). Even allowing for a tripling of small business revenues as a share of total revenues by 2023 (far beyond the growth Apple has reported), Apple’s estimated income from the App Store fees would still be around \$26 billion, or around 7 percent of total 2023 Apple revenue.

Since 2021, Google's annual revenue from the Google Play store has been over \$40 billion. Google's annual revenues in recent years have grown from \$250 to over \$300 billion. Thus, app store revenues are ~15 percent of Google's revenue.

#### D. Two Types of App Store Fees

We define an 'Access Fee' to be a fee assessed by the gatekeeper and borne by an app store or alternative distribution channel for the right to reside on the gatekeeper's operating system. Our analysis also occasionally considers the distribution fees paid by developers for two reasons. First, when the gatekeeper's own store charges a high price to developers, developers will seek alternative distribution channels. If fees charged by the gatekeeper to third-party app stores are zero, developers may want to join together to open their own stores, as this could lower the cost of distribution. Second, the gatekeeper can design a fee that is formally paid by the developer but functions as a cost to the entering app store. For example, a fee that a developer pays on its sales through the Apple App Store *only* if that developer also distributes through a third-party app store blocks that store's ability to attract content. This design may cause a regulator to confuse the party who formally pays the fee (the developer) with the party whose access to the operating system is rendered ineffective by the fee (the third-party app store).

We define a 'Review Fee' as the fee that a business user pays to the gatekeeper or its agent to undertake a safety and security review of the app or app store software. This is a fixed fee per app or app store being reviewed and its level will be related to the cost of the review function. We keep this fee conceptually distinct from the Access Fee above.

There may be other fees charged by gatekeepers such as the prices of handsets, other hardware, and different types of advertising. These are not the focus of our analysis because the DMA does not (generally) constrain them.

#### E. DMA-Recognized Functions within the App and App Store Ecosystems

The DMA describes three key entities within the app and app store ecosystem.

*Gatekeepers:* Apple and Google each are designated gatekeepers that control both an operating system that has been designated a core platform service, or 'CPS' (iOS for Apple, Android for Google) and an app store that also has been designated a CPS (the App Store for Apple and the Play Store for Google).

*Business Users:* the business users who might seek access to these CPS's are the app developers, that is, firms other than Apple and Google that develop and seek to distribute 'software applications,' and/or 'software application stores.' A developer offering a new mobile game would want access to the App Store and Google Play (and any third-party app store) to facilitate end-user downloads of the new game app onto their devices. A business user might want to open and run a third-party app store for either the Apple or Google Android OS.

*Intermediation Services:* App stores constitute intermediation services that link the developer business users to end users. Definition 2(14) says 'software application stores' means a type of online intermediation services, which is focused on software applications as the 'intermediated product or service.' App stores operated by rivals additionally qualify as business users under Definition 2(21) because an app store uses 'core platform services for the purpose of or in the course of providing goods or services to end users.' Thus, all apps are business users, but only those apps that operate as app stores also qualify as intermediation services.<sup>3</sup>

<sup>3</sup> DMA Definition 2(5) defines 'intermediation services' by reference to 2(2) of Reg. 2019/1150. We can imagine some line blurring between apps as business users and app stores as intermediation services. A game app might offer the ability to download other games without leaving the app, for example. Whether incidental, store-like features such as these are sufficient to push a traditional nonstore business user over the line so that it also should be considered an intermediation service is beyond the scope of this paper. We reported the possibility merely to alert enforcers that the dividing line between the seemingly separate categories might be more porous than the DMA's definitions suggest.

## F. Legal Framework Governing Fees for App Stores

Several Article 5 and 6 obligations, read collectively and in conjunction with certain of the DMA's recitals and definitions, together provide a legal framework for analysing compliance of these fees and any others. Whether a particular fee is DMA compliant depends not just on its nature or size, but also on who is charging it to whom as a condition of access to which CPS. One of the points we make below is that very often the DMA rules generate results that coincide with the optimal pricing principles generated by economic analysis. The rules do a good job of creating appropriate incentives and maintaining efficiency while advancing the DMA's twin goals of contestability and fairness. The overlap between the DMA rules and the outcomes generated by reasoning from economics first principles is not always perfect, however. As we shall see, the DMA specifies certain limitations that are *consistent* with first principles but not necessarily commanded by or easily derived from them. For this reason, it is important to lay out the legal framework the DMA expressly erects. Our subsequent exploration of the related economic theory will illuminate the rationale of these rules and help inform the Commission's enforcement of them in a way that is most likely to generate access fee structures that are DMA compliant, that advance the DMA's twin goals of contestability and fairness, *and* that are economically optimal, meaning that they are efficient and maximize welfare. Here is this framework:

- Art. 6(4) DMA provides that the gatekeepers must allow 'effective use' of apps and app stores on their operating systems. This obligation includes, expressly, a technical access component (the gatekeeper cannot allow access that makes an app or app store run at half-speed, for example) and, by implication, a pricing component. Although Art. 6(4) DMA does not mandate that access to the operating system is free of charge, the 'effective use' provision acts as a substantive fee cap: if any combination of fees relating to access to the OS prevent 'effective' use of the OS, they are noncompliant.
- In addition, Art. 6(4) DMA provides that gatekeepers may, in respect of safety and security reviews of both apps and app stores, take 'measures' so long as they are 'strictly necessary and proportionate' and also 'duly justified' by the gatekeeper. Recital 50 clarifies that it is the gatekeeper's burden to show that 'there are not less-restrictive means' than those it has chosen 'to safeguard the integrity of the hardware or operating system.' Further, it is implied that if a gatekeeper elects to undertake such measures, it may set a Review Fee for undertaking a safety and security review of an app or app store. This is a fee the DMA permits but substantively limits.
- Recital 40 (which elucidates the Art. 5(4) DMA obligation to allow business users to communicate and transact with their end users through alternative distribution channels free of charge) makes it clear that gatekeepers may charge business users for facilitating the *initial* acquisition of end users. The text states, '[a]n acquired end user is an end user who has already entered into a commercial relationship with the business user and, where applicable, the gatekeeper has been directly or indirectly remunerated by the business user for facilitating the initial acquisition of the end user by the business user.' That is, the gatekeeper may charge a business user for substantively facilitating a new match between a business user and an end user. This is a conceptually distinct activity from simply being the gatekeeper, whose function is necessary for business users and end users to connect in any way, whether old matches or new. The DMA does not state that a gatekeeper may continue to charge the business user beyond the new match, and indeed Art. 5(4) DMA confirms that it cannot charge for any communication between a business user and its end users.<sup>4</sup>

<sup>4</sup> The Commission has fined Apple for noncompliance with Article 5(4) (European Commission, 2024b).

- There are certain access fees the DMA expressly prohibits. For example, Art. 6(7) DMA requires the gatekeeper to provide business users access to the same functions of the handset (those that operate a handset's speaker, for an obvious example, but also all other application programming interfaces (APIs) that the designated CPSs of the gatekeeper uses) that it makes available to its own services, free of charge.<sup>5</sup>
- The DMA also prohibits any indirect measure, which includes fees, that undermines the effectiveness of the access the DMA seeks to guarantee. Art. 13(4) DMA states, 'The gatekeeper shall not engage in any behaviour that undermines effective compliance with the obligations of Articles 5, 6, and 7 regardless of whether that behaviour is of a contractual, commercial or technical nature, or of any other nature, or consists in the use of behavioural techniques or interface design.'<sup>6</sup>
- Art. 6(12) DMA permits gatekeepers to impose conditions (including fees) on business users, that is, apps, seeking distribution through the gatekeepers' own app stores. Those conditions must be FRAND and the gatekeeper must publish them.

### G. Apple's Fees and Their Impact

Until the enactment of the DMA, Apple did not permit alternative distribution of apps on iOS at all. As of August 2024, Apple has implemented a variety of fees on app developers and rival app stores. We summarize these below and include details (including the cost of belonging to the Apple developer program) in [Appendix 1](#).

- *Fees imposed on rival app stores:* A fixed fee of €0.50 times the number of annual users.
- *Fees imposed directly on third-party apps distributed through the Apple App Store:* The large developers pay either (a) 30 percent of revenue earned through in-app purchases, (b) 20–25 percent of revenue by linking out payments from apps only on the App Store, or (c) fees ranging from 10 percent to 20 percent of revenue, plus a fixed fee of €0.50 times the number of annual users (after the first 1 million).
- *Fees imposed on third-party apps if they stop exclusive use of iOS:* If the developer uses any alternative distribution channel other than iOS for its app, including linking out to the web, it must move to option (c) above and thus pay €0.50 per annual user regardless of the app store those users employ to get the app (meaning the sum of the users in the Apple App Store as well as in third party stores, less 1 million).

The first fee is an Access Fee charged to rival app stores for them to reside on iOS. It monetizes the existing network effects of the gatekeeper. With the third fee, Apple blocks the entry of rival app stores as well as sales through developer websites, thereby creating fees that work directly against contestability. Consider 'free' apps that are used by companies like banks, e-commerce, and offline business to connect to their customers, for example, Santander, Amazon, and Deliveroo. Also relevant are apps supported by advertising such as Facebook, Instagram, and Sky News. Today, these apps can pay zero in fees to reach their end users through iOS. However, if they choose to distribute through an alternative store they must move to the new (c) terms of the Apple store, namely €0.50 per user per year (less the first 1 million users). Critically, *this fee is calculated on all installs regardless of the app store in which the downloads occur*. That is, the app developer must now pay €0.50 for Apple App Store users it previously served for free. For example, if Deliveroo distributes its app through a rival store, the company will have to pay €0.50

<sup>5</sup> A specification decision to ensure compliance has been issued (European Commission, 2025b).

<sup>6</sup> DMA Recital 50 also covers this material.

for every user that it serves through the Apple App Store as well as for every user downloading the app through the alternative rival store (after the first million across all stores). A switch in terms is also required if the developer updates its app to include a link out to the web, though in its August 2024 fee schedule update, Apple created option (b) above, allowing linking out at a discount for developers who remained only on the Apple App Store (Singh, 2025).<sup>7</sup> The Apple pricing scheme effectively means that any app developer with millions of existing downloads will become liable for a very substantial annual fee to Apple the moment it decides to employ distribution options other than the Apple App Store.

An app developer is permitted under Art. 5(4) DMA to tell its users about alternative distribution channels where they can find better or different offers and, with respect to those acquired users, Recital 40 clarifies that the gatekeeper cannot tax those communications or the resulting transactions with those users. Users might want to click on a link that takes them out of the app to a website where they can buy a subscription or a game for a lower price on the developer's own website compared with the price in the app. If the developer updates its app to contain these instructions and the ability to link outside, Apple requires the developer to move to one of the new terms. Under option (b) above, the developer must pay 20–25 percent of purchase revenue to Apple (instead of the original 30 percent)—plus a fee to the payment processor of its choice, which is widely viewed to cost about 3 percent of sales—but can only distribute its apps through the Apple App Store. In total, then, the developer expects 2–7 percent in savings (perhaps even less if processor fees exceed 3 percent) on purchases. The higher end of savings only applies to purchases made once the first year after a user first downloads an app ends. The other alternative for the developer is to move to option (c) above. Under these terms, the developer gets the option to distribute apps through a rival store as well as link out purchases, but must pay Apple user fees and transaction fees. First, the developer must pay Apple the large annual charge of €0.50 for each of its users (less 1 million). Then, the developer must pay Apple 10–17 percent of sales, depending on its choice of payment system, plus an ~3 percent payment processing fee to a chosen processor. Again, the lowest end of the fees only applies to link out purchases made once the first year after a user first downloads an app ends. At the high end of the fees (which applies to the most user-friendly purchasing forms and to purchases made in the first year after initial download), developers who choose to use third-party payment systems instead of Apple's will still end up paying 18–20 percent of revenue in combined fees to Apple (15–17 percent) and a payment processor (~3 percent). This figure is almost identical to what the developer would pay if it were to stay entirely inside the Apple App Store, which charges a 20 percent commission under the new terms. Of course, under the new terms, the developer must also pay the €0.50/user-over-1-million fee to Apple, too, whether its applications remain entirely within the Apple App Store or not.

By making alternative distribution channels as costly as remaining with the legacy app store and not attempting to link out, Apple's fee structure prevents disintermediation of the App Store. Overall, Apple's scheme has the effect of choking off demand for rival app stores as well as rendering direct distribution unprofitable for many developers. Together, these policies have triggered noncompliance proceedings by the Commission (Crémer et al., 2024a).

It is interesting to speculate that the difference between apps and app stores may become less clear going forward. For example, some apps may be designed to encourage the user to download other apps. A player of Game A might be informed by Game A that he or she might enjoy Game B. Game A would at the same time offer the user the opportunity to buy Game B within the environment provided by Game A—without the need to navigate to an app store. For the purposes of this paper, however, we keep apps and app stores as two distinct categories.

<sup>7</sup> For more information on the terms outlined above, see Apple Inc (2024).

We note additionally that if there were vigorous competition among app stores—in other words, Apple’s app store competed fairly with multiple third-party app stores—there would likely be no policy concern regarding the fees in the App Store. In that situation, if the fees Apple charged in its own store were higher than justified by its quality, developers and end users would change to one of the many third-party app stores on iOS or link out to their own web distribution.<sup>8</sup> For this reason, the analysis below spends little time on Apple’s fees for its own distribution services. Future robust competition may provide helpful evidence on what constitutes FRAND app store terms and fees (European Union, n.d.).

### III. FAIRNESS AND CONTESTABILITY IN APPS AND APP STORES

The first goal of the DMA to advance fairness between gatekeepers and business users is satisfied with an Access Fee of zero for rival distribution channels.

#### A. Fairness

We begin with the first goal of the DMA which is fairness. The final version of the DMA contains a definition in Recital No. 33 (according to its opposite):

For the purpose of this Regulation, unfairness should relate to an imbalance between the rights and obligations of business users where the gatekeeper obtains a disproportionate advantage. Market participants, including business users of core platform services and alternative providers of services provided together with, or in support of, such core platform services, should have the ability to adequately capture the benefits resulting from their innovative or other efforts.

This definition, though it uses the terms on ‘rights and obligations’ in the first sentence, is entirely consistent with economic principles in its second sentence. We deploy these concepts below by considering a variety of economic effects relevant to a digital platform.

#### 1. Average Contribution

Any consideration of a ‘fair’ fee for app stores should recognise and reward the benefits that app developers bring to users of the handset. Without a large number of developers offering useful functionalities, the size of the iPhone market would be far smaller. Indeed, this was Steve Jobs’s conclusion back since 2008 when he opened up the App Store to third-party developers.<sup>9</sup> App developers bring users to the handset. While business users attract consumers to the ecosystem and those consumers purchase handsets, the consumers in turn attract business users who develop more applications. The platform gains from the trade between the two sides and can monetize it because of the strong network effects that prevent either side from leaving the platform easily.

Crémer et al. run a thought experiment in which end users and business users can coordinate to move simultaneously to a rival platform (in this case, a rival app store) (Crémer et al., 2023). The loss to participants from leaving Apple, or any given gatekeeper, will be relatively small if

<sup>8</sup> Switching should become easier as a result of the DMA (Article 5(4)) and the Commission’s decision in Case AT.40437 (European Commission, 2024c). Both require that Apple remove antisteeering provisions from its terms and conditions. This will allow apps that users currently operate via the App Store to inform these end-users of cheaper options elsewhere.

<sup>9</sup> This is confirmed by some of the findings in the Commission’s Apple decision. Evidence shows that large developers typically bring their own audience to their iOS apps typing the name of the service provider they are looking for. For example, Match Group found that the majority of new users from the App Store organically searched for its apps (for example, by typing ‘Tinder’) while Apple contributed only 6 percent of discovery. In such cases, curation by Apple has little or no effect in app discovery. Apple itself acknowledges that in general ‘65–70 percent of searches are for specific apps rather than searches for general topics such as music or travel.’

the main reason they participate in the store is because of the presence of the other side. The rival could have a better or worse interface; either way, its impact is small relative to the value of the network effects. For this reason, any fair price the gatekeeper charges will be low because it will reflect *only* the gatekeeper's value added, not the value added by the group of end users and the group of business users. The fair price therefore redistributes surplus that was formerly captured by the gatekeeper to business users who likely pass through some of it to end users. Higher returns to the business user for the value it creates incentivises business users to invest and innovate, increasing productivity and growth, as well as entry.

Indeed, there are sound reasons one might reasonably conclude that the fair price Apple should charge a rival app store for the privilege of residing on iOS should be *negative*. This is because we can presume that new, exciting and innovative app stores will attract new developers and drive end user engagement, making the handset more valuable to both sides of the platform and therefore also to Apple (in ways Apple can freely monetize as described above). We have no direct evidence of this, but we can look by analogy at evidence from other handset manufacturers' efforts to attract developers to their platforms. Huawei, for example, was willing to spend \$1.5 million to attract developers to its platform after losing access to the Play Store (McDonald, 2020). Similarly, Microsoft was reportedly willing to pay developers \$600,000 per app to be placed on the Windows phone (Gralla, 2012; Frick, 2012; Wortham & Winfield, 2012). Because, as we have described, apps and app stores both increase the value of handsets, Apple might fairly be expected to pay third-party app stores for their presence, just as Huawei and Microsoft were willing to pay apps for their presence.

Each mobile operating system gatekeeper initially began life with a business model that did not rely on selling business users access to its platform. Each earned revenue from end users. Apple sold a handset that came with an operating system and other hardware, whereas Google sold advertising. For both gatekeepers, the network effects generated by developers were, and are, critical to making the business model work.

## 2. Return on Investment across Parties in a Complex Ecosystem

Even after an app store is entrenched, and is designated as a gatekeeper, the need to attract more interesting developers to increase the use and value of the device and its ecosystem means that gatekeepers do not generally find it in their interest to impose high fees on most developers.<sup>10</sup> QR ('quick read') codes offer a prime example of this positive feedback loop. First developed since 1993, QR codes did not immediately gain traction with device users. Indeed, clunky and ill-conceived early uses—plastering a QR code on the side of long-haul truck or on a billboard aside the interstate highway—made QR codes the frequent butt of jokes among marketers and advertisers. The principal explanation for QR codes' initial 'failure to launch' is that they required specialized readers. This made the codes useful to consumers only in a narrow set of applications (for example, when scanning an airline boarding pass at a gate with an embedded QR code reader) but useless in most other settings.

<sup>10</sup> Apple itself points to the supposedly low fees it charges developers as a key economic driver of its thriving app ecosystem. The subtitle of a 2023 press release proclaiming that the Apple ecosystem generated a total of \$1.1 trillion in billings and sales in the prior year practically brags that 'More than 90 percent of billings and sales accrued solely to developers without any commission paid to Apple' (Apple Inc, 2023). More recently, Apple reportedly has asserted that 85 percent of apps pay no commission. Google Play's website asserts that a whopping 97 percent of apps pay nothing for distribution on Google Play (Knowles & Pistone, 2024). Plainly, these companies perceive significant value in the distribution of apps that draw end-users to their device, which raises the question why Apple insists on charging a large commission specifically to those business users that pose the most significant competitive threat. Consider also that Google charges a one-time fee of \$25 for all developers (Google Play Console, n.d.). The Apple Developer Program has remained at \$99/year (Apple Inc, n.d.-a). These fees are for the base level software development kit. Though there are some additional tiers that cost more, and though some developers contend that all software development kits should be free, these membership costs have stayed relatively modest. Further, using mac iOS to develop an app prior to any attempted distribution is free (Apple Inc, n.d.-b).

This all changed since 2017 when, in connection with the iOS 11 update, Apple incorporated a QR code reader in its native camera app. Millions of users suddenly and for the first time were carrying QR readers in their pockets. A developer who could find a cool use for the new technology would give users a reason to upgrade their handset and spend more time on it watching advertising. This spurred advertisers, marketers, and developers to experiment with countless new, consumer-friendly uses for the QR code, for example embedding the links in product labels to give easy access to useful and engaging information (Travers, 2017).

The explosion of exciting new QR code placements encouraged users to update to iOS 11 more quickly than they might have otherwise. It also provided users even more frequent reasons/excuses to pull out their phones, making the users more excited about the products whose QR codes they scanned *and* more available for ad delivery from other advertisers as well. All sides of the platform reaped the benefits of Apple's inclusion of the QR reader. And, of special significance to this paper, so too did Apple, even though Apple charged no access fee whatsoever (to developers, to marketers, or to users) upon embedding the QR code reader in its camera app.

Apple's price of zero for developer access to such APIs may reflect the economic value that developers contribute to the gatekeeper's business, in particular the network effects needed for a successful OS or app store. By offering access to APIs at no charge, gatekeepers help induce developers to take commercial risks, which they hope will yield exciting apps that draw users to the operating system and create lucrative network effects for the gatekeeper.

### 3. *Expropriation of Existing Rents*

Another issue with making an assumption about the sign of net value creation for any given developer is that many app developers such as Netflix or the Financial Times pre-dated the iPhone. The new app distribution channel allowed for more functionality and was efficient for these developers. However, many of their users had subscribed or became familiar with their services before the App Store was invented. Indeed, the arrival of these existing popular services on the handset increased its value to users and drove network effects that benefited Apple. For a gatekeeper to later justify any charge, as a 'customer acquisition fee' is therefore a misnomer.

### 4. *Discrimination*

A different notion of fairness that appears in the DMA recitals is that the law embodies a principle of nondiscrimination. That principle would require Apple to charge the same fee to rival app stores as it charges to its own app store. However, fees charged to itself have no economic impact (such a fee is simply a transfer from one part of Apple to another) and therefore Apple's store effectively pays zero. By this logic, rival stores should also pay a zero access fee, which is again consistent with our arguments above.

Until the recent changes, Apple charged a fee of zero to business users that effectively run stores selling goods delivered outside the handset such as [Booking.com](https://www.booking.com) or Amazon. An interpretation of fairness under the DMA could require that fees to third party stores distributing goods consumed on the handset be no different than fees for stores distributing goods consumed off the handset. We do not pursue this interpretation in what follows.

## B. A Fair Access Fee

### 1. *Can Network Effects be Distinguished?*

In principle, one could try to separate out the value of superior technology from the network effects and explore a way for the gatekeeper to charge for the former. However, the superior technology is due, at least in part, to the fact that the gatekeeper's platform has enjoyed superior learning by doing over the years as well as to the benefits that it derives from the data it has acquired thanks to network effects. Thus, network effects will always be the source of at least

some of the gatekeeper's advantage, and these may not be monetized in an Access Fee. The difficulty of proving the value of superior technology—entirely separated from the market power of network—is one that the gatekeeper must surmount if it wants to justify a fee based on some technological offering.

In aggregate, apps have brought, and still bring, as much benefit to the gatekeeper as the gatekeeper does to the developers.<sup>11</sup> It is therefore unfair for Apple to then trap the business users on the platform—which is an element of the ecosystem they co-created—with a monopoly app store and high costs of distribution. Business users have no choice but to accept some version of Apple's commission plus the Core Technology Fee ('CTF') because of Apple's entrenched market power derived from these network effects. By contrast, the availability of rival app stores and links to web sites give developers a choice about how to distribute. Accessing those alternative distribution channels lets apps keep a greater share of the surplus they generate. Fairness therefore requires that there are no barriers put in place to the effective functioning of rival app stores. Fees levied by the gatekeeper on developers wanting to use those stores or link to the web to carry out their own sales are likewise unfair. In addition to access restrictions and fees being forbidden, some other kinds of fees or technical limitations on distribution for business users could be unfair because they are an inaccurate reflection of the gatekeeper's contribution to the platform.<sup>12</sup>

## 2. Is a Finder's Fee Fair?

One of the original justifications offered by Apple for its developer commission was as a 'finder's fee' for delivering its wealthy and tech-savvy consumers to business users.<sup>13</sup> This sounds like a version of a fee permitted by the DMA, an 'initial customer acquisition' fee. However, a monopoly gatekeeper benefitting from powerful network effects is not 'finding' many people today because (virtually) all end users single home on a gatekeeper platform already. For example, if such a user has searched the app store for 'Spotify,' it is more likely that Spotify created that demand than that Apple specifically invested to bring a group of music enthusiasts to Spotify. Instead, as described above, it may be the arrival of the Spotify app that attracts the music enthusiasts to the ecosystem in the first place or deepens their engagement with it.<sup>14</sup> Therefore, to the extent Apple justifies an Access Fee as the 'initial customer acquisition fee' the DMA contemplates, this likewise fails a fairness test.<sup>15</sup> Moreover, an 'initial' fee is clearly time limited and does not attach to the customer's relationship with the app store or app *ad infinitum*. For example, an 'initial customer acquisition fee' that took the form of advertising

<sup>11</sup> This observation has led J. Padilla (Padilla, 2024) to conclude: The pie should be divided so that the gatekeeper is remunerated in proportion to the net incremental value of the gatekeeper's platform relative to its next best alternative. This means that it is able to appropriate the full value of its superior technology but not the value associated with the network effects that characterize the core platform services regulated by the DMA. The practical implementation of this surplus-sharing rule is difficult but not impossible.

<sup>12</sup> The gatekeeper remains responsible for showing fairness and contestability of these other fees.

<sup>13</sup> The Commission's 2024 decision recounts Steve Jobs's own explanation of this justification, quoting Jobs in 2011 as stating: '[O]ur philosophy is simple—when Apple brings a new subscriber to the app, Apple earns a 30 percent share; when the publisher brings an existing or new subscriber to the app, the publisher keeps 100 percent and Apple earns nothing' (European Commission, 2024c).

<sup>14</sup> It may be that very few end users adopted the iPhone specifically to access Spotify, but it is easy to imagine ways in Spotify's presence (or the presence of any number of other apps) could lead end users to engage with their devices more frequently and for longer stints. A gym goer who might usually leave her device in her locker might, after downloading Spotify, keep her device with her so she can listen to music while on the treadmill. Increased engagement of this sort contributes value to the ecosystem and to all of its participants.

<sup>15</sup> Our point is not that the DMA makes any fee based on the 'finder's fee' theory unfair or noncompliant. To the contrary, the DMA contemplates that the Gatekeeper may charge 'for facilitating the initial acquisition of the end user by the business user' (Recital 40). But, once the end users are acquired, the DMA makes clear that business users (apps or app stores) should be free to communicate and conclude transactions with their end users through whatever channel they choose, without paying additional 'finder's fees.' This is to 'prevent further reinforcing their dependence on the core platform services of gatekeepers, and in order to promote multi-homing.'

within the App Store could be perfectly fair as it performs a match within the ecosystem that is time limited. Ordinary nondeceptive advertising by app stores may be compliant with the DMA for this reason.

### 3. *Is a Review Fee Fair?*

A Review Fee, as described above, is fair if it is appropriately related to the cost of the necessary review activity. If a gatekeeper, for example, needs to do a security check that ensures the app works as promised and collects data as explained, the costs for doing so are also social cost. For incentive reasons also, these costs should be borne by the business user. App or app store review costs, however, are likely to be largely independent of how many people use the store, independent of whether an app or app store shows advertising to users, whether it has an upfront purchase price, or earns money from in-app purchases. If the cost is independent of the revenue an app generates then so should be the fee collected to cover it. A compliant Review Fee will efficiently allocate the costs of carrying out the review, and we expect this fee to be both fixed and positive.<sup>16</sup>

## C. Contestability

The second goal of the DMA after fairness is contestability, which is defined as follows in Recital 32: ‘For the purpose of this Regulation, contestability should relate to the ability of undertakings to effectively overcome barriers to entry and expansion and challenge the gatekeeper on the merits of their products and services.’ This means that gatekeepers cannot unduly use their gatekeeping power to monopolize or otherwise tilt the playing field in their favour when competing in other services such as those apps or app stores provide.

The goal of the DMA to advance the contestability of gatekeeper markets is also satisfied with an Access Fee of zero for rival distribution channels.

### 1. *Positive Store Access Fees Undermine Contestability*

An app store, and sometimes an app itself, competes either with the monopolist itself (for example, the Apple App Store, Apple music) or with another app that is favoured by the gatekeeper (for example, one that pays the gatekeeper as Google does for search access points). Contestability requires that the rival app store be able to get onto the handset and offer apps at similar terms to the gatekeeper’s store. Because the gatekeeper’s store pays no fees to the gatekeeper, this creates a benchmark of zero fees for the rival store.<sup>17</sup> Technical barriers or contractual ones would likewise constitute other straightforward hurdles that the law prohibits. If an entrepreneur wishes to launch a rival third-party store to contest Apple’s monopoly distribution channel, it must have the same costs and functionalities as Apple or the market will not be contestable. For Apple to then charge an Access Fee on third-party app stores is *a priori* inimical to the DMA.

### 2. *Disintermediation Improves Contestability*

Consider the alternatives that developers have when considering use of rival app stores. A rival store must offer improvement over its customers’ other options, namely the gatekeeper’s store and a developer’s cost of disintermediating and making the sale through its own website. If gatekeepers allow linking out to function freely, the developer will consider its cost of setting up and running its website. It will compare that to the fees charged by all the stores on the platform.

<sup>16</sup> One may be tempted to argue that charging a percentage of revenue allows risk-sharing between the business user offering the app and the gatekeeper. But given that the fee for such security checks is likely to be very modest and in line with what firms have to pay now to be enrolled in Apple’s developer program, such risk-sharing incentives are unimportant in practise.

<sup>17</sup> Indeed, across other major OSes, including Android and Windows, rival ‘app stores’ like Steam also pay no access fees, which offers additional support for a zero access fee benchmark on iOS.

If a gatekeeper can charge access fees to an entering app store, that store would have to pay the costs of its own operations as well as the gatekeeper's fee. If the rival store attempts to add the gatekeeper fees onto what it charges app developers, those app developers could be driven to use the gatekeeper's own app store (if its prices are lower) or disintermediate stores entirely and link out to the open web where they would pay only the cost of operation.

This outside option of disintermediation is a significant constraint on the prices a third-party store can charge, as well as on the prices the gatekeepers' stores can charge. Recognizing the power of disintermediation explains why both Apple and Google have chosen to impose the same fees on sales that developers make through linking out to the web as they do in their own stores. If fees to sell on the web were eliminated, while the gatekeeper continued to charge rival stores an Access Fee, such stores will have a much harder time competing with web sales. Likewise, eliminating Access Fees will allow rival app stores to be competitive with external channels as well as the gatekeeper's own store.

### 3. *Competition in App Stores May Improve Contestability of Platforms*

Contestability in apps, app stores, and mobile operating systems will increase for three distinct reasons when there is a right of access without charge. First, businesses will have increased incentives to enter due to the prospect of connecting with the many end users on the other side of the interface. Second, a regulated interface gives business users not just the right of access to that interface, but certainty about that right going forward, again increasing the incentive to invest. The right of access has a final competitive implication: The DMA protects a business that innovates in a way that creates a potential future competitive threat to the gatekeeper. This is likely to be the case for the biggest app stores, particularly those that become middleware and threaten the market power of Apple. Thus, in the long run, the right of access can create contestability for the platform itself.

To the extent that third party apps delivered through third-party app stores can evolve into competitors for platform services of various kinds in the future, gatekeepers have incentives to foreclose that channel of distribution. Importantly, when a rival store has the right to access a gatekeeper's interface for no Access Fee, neither the store nor the app itself is controlled by the gatekeeper (other than through the security review process). Either can develop its technology in any direction it chooses and monetize that business model. A 'super-app' could enter this way and become the core of a new platform that competes in some way with incumbent platforms, benefitting consumers. The possibility of increased contestability in the future may be why the gatekeeper does not allow rival app stores today. The DMA allows more creative directions for innovation and technology to have a chance of facing a market test with users, rather than being shut down by the incumbent gatekeeper. This discussion makes it clear why a positive Access Fee harms contestability in many markets; monetizing the market power that comes from network effects restricts the entry of potential competitors in mobile operating systems as well as app stores.

## IV. SPECIFYING A COMPLIANT FEE STRUCTURE

### A. DMA Enforcement

Many regulations contain specific technical provisions established by the regulator that the regulated firms must follow. The DMA does not take this approach. Rather, under the DMA it is the gatekeeper's responsibility to find a way to meet the mandates and prohibitions of the law with regard to its app store fees [20, Article 8(1)].

Even at the outset of the specification process, it is the gatekeeper's obligation first to propose measures that it deems compliant with the DMA and provides a reasoned submission as to why it thinks the measures are compliant [20, Article 8(3)]. Thus, the Commission does not start

with a blank slate. This assignment of responsibility takes advantage of the superior knowledge of the corporation about its own complex technology, its ecosystem, and its business strategy, particularly relative to the knowledge of regulators in Brussels on those subjects. If a gatekeeper proposes fee structures that are exclusionary, the regulator will determine they are noncompliant and collect comments from interested third parties. It may explain the measures the gatekeeper should take to fix the problem [20, Article 8(6)].

At the time of writing, the Commission has found Apple to be noncompliant under Art. 20(1) DMA with respect to Apple's new terms for business users insofar as they prevent developers from communicating with users about alternative payment options (European Commission, 2025c). An investigation of the Core Technology Fee is ongoing (European Commission, 2024d). For the reasons set out above, we agree that the current Apple proposal is not complying with the DMA. Both the level of the Core Technology Fee and its structure as well as the varying commissions on web sales harm the free choice of distribution by developers.

Given this conclusion, what is the next step for the Commission? Article 8(2) of the DMA allows the Commission to further specify what the gatekeeper must do to comply with the law. If it chooses to do so, the Commission would set a third-party app store Access Fee and give guidance on acceptable Review Fees. The compliant and proportionate scheme is a positive cost-based Review Fee, a zero Access Fee, and whatever the gatekeeper chooses to do with the rest of its ecosystem that does not circumvent the DMA. The first two elements should be specified by the Commission, while the gatekeeper can determine its own handset price, accessory prices, advertising prices, and the like. There may be other ways to comply with Article 6(4), but it is up to Apple to propose them and to demonstrate that they do comply.

In our view, it will be very costly to business users and end users if the Commission uses the DMA process to permit a noncompliant fee to remain in place for years while the regulatory process winds through the courts. Such a situation harms contestability and fairness, the goals of the law, while creating uncertainty about whether the law will ever be enforced in a useful way. For the reasons set out above, the DMA prohibits Apple from setting up barriers to its own potential competitors, nor can the gatekeeper appropriate surplus of others, both of which occur due to the existing fees. We stress that our proposal does not preclude Apple from deriving monetary benefits from the presence of other app stores, as it can do this through an increase in the price of the device. It might argue, as it has, that the presence of these competing app stores decreases the value of the platform by making it less safe (Inc, 2021). Even if this were the case, which we do not believe to be true, Apple must still adhere to the rules in the DMA and can only charge positive access charges if it can show that this can be done by preserving fairness and contestability.

## B. Tradeoffs

Mobile ecosystems are the nexus of numerous interlocking markets. It is therefore important to consider whether an access fee of zero for app stores would have tradeoffs (economic costs) in the broader ecosystem. Standard economic methods would entail constructing a full model of the entire ecosystem to solve for optimal prices for each of its elements. Such a task, though, is very difficult, especially given the empirical challenges that innovation and evolution of costs, demand, and technology pose. In lieu of fully systemic analysis, there are several reasons to conclude that there is very likely little to no welfare loss from setting a store Access Fee to zero. First, third-party app stores are direct competitors to the gatekeeper app stores. Ordinary harm to competition in a monopoly app store market is likely to outweigh indirect benefits (undertaken in the least anticompetitive way) to the consumers in those stores.

App store competition in Europe has already generated price competition (Matsakis, 2024). In addition, the innovation that is likely to flow from competition in app stores is significant.

We can see from the opening up of consumers' television sets from a monopoly cable provider to Netflix, Disney, Roku, Hulu, and many others just how much consumers value choice. The new environment in app stores is likely to drastically increase consumer surplus and business user profit. Several alternative app marketplaces are in various stages of launching on iOS in the EU, including Epic Games, AltStore PAL, Aptoide, Setapp Mobile, and Mobivention (Perez, 2024). All except the last store are consumer-focused stores, and most are focused on gaming. Mobivention works with businesses to distribute internal apps with the ability for larger enterprises to build customized internal app marketplaces. The breadth of these marketplaces' targeted user bases offers an early indication of the potential surplus to be generated by app marketplace competition.

Second, existing app store policies were not chosen to be optimal. There is abundant evidence that gatekeepers have little to no analytical justification for their access fees. For example, in setting a 30 percent commission fee on in-app purchases, the costs of running the App Store were not considered; rather, the percentage roughly matched Apple's cut on a \$0.99 song sale on iTunes to cover costs of transactions after paying the music companies their share.<sup>18</sup> According to the Commission, furthermore, '[t]he economics of and the impact on the downstream markets were not taken into account when setting the level of the fee' [19, para. 126]. This was confirmed by Apple's external economic adviser:

'The point is that the totality of the investments, and not just in the App Store, but in fact in the entire ecosystem, are monetised through a complex set of tools [...] or channels: the App Store commission, services, most importantly the price of the device that is the main means through which investments are recovered, and advertising. So you have a set of channels through which you recover investments. The point I am trying to make is that that 30 percent commission is not even what is required to map exactly into the investment into the App Store. It's one of the channels through which monetization occurs for the entire ecosystem [...].

'The monetization objectively falls on a category of developers and there is vast cross-subsidisation to a huge tail of developers who pay zero, so benefit, get a sweet-heart deal, from this business model. The point is, someone needs to pay, and at the moment, there is a bunch of people who pay, but if you change that bunch of people, someone else needs to pay. [...] by definition, what I am saying is that in a world in which somebody pays and somebody doesn't, those who don't pay are being cross-subsidised. It's an objective observation. The point of how much of this is effectively going to be the component, I don't know, no-one does those calculations' [19, para. 806].

Apple and Google have both shown their willingness to lower fees for app developers in response to public pressure—and to do so simultaneously and in round numbers. These are not characteristics of solutions to difficult engineering problems that vary by platform. For example, since 2021, in response to public scrutiny of App Store fees, Apple lowered its fees on small developers and for subscriptions (Epic Games, n.d.-a). Google implemented similar fee changes directly after Apple announced its move (Feiner, 2021).

Third, there are many other instruments that gatekeepers can use to charge for other aspects of their ecosystems to balance demand and create incentives for all parties to maximize surplus (Etro, 2021; Anderson & Bedre-Defolie, 2024). It is important to be clear, however, that changes

<sup>18</sup> 'There was some precedent for how Apple arrived at 30 percent. Apple had been charging roughly the same commission on music sales on its iTunes software. For each 99 cent song it sold, Apple passed on 72 cents to major music labels or 62 cents to independent labels....' (Nicas, 2020).

in these other policies and prices may not be used to circumvent the DMA. Apple can, however, increase the price of its handset or advertising in the app store for example. Google likewise has prices and services unconstrained by the DMA that it can use to balance demand and extract rents.

### C. Circumvention

The proposal we have put forward—a zero Access Fee and a cost-based Review Fee—is not Apple’s first choice by revealed preference. Because Apple has an incentive to evade such regulation and has many types of fees, services, and design choices, the Commission may have to enforce Article 13 of the DMA, the portion of the law which explicitly prohibits circumvention. For example, Apple could impose price-parity or other types of parity conditions on apps on the App Store with respect to iOS app stores so as to prevent them charging lower prices on rival iOS app stores; demote apps or make them harder to discover on the App Store if they also list on rival app stores;<sup>19</sup> charge more for its own store if developers use rival stores, or similarly, give incentives to developers that do not launch in rival app stores as Google apparently did (Zeff, 2023); manipulate the review process to make it longer and more costly for a rival app store, and so forth. The speed and sophistication of the digital gatekeepers make it likely we will see circumvention tactics that are difficult to detect and prevent or reverse.

This type of behaviour creates a significant enforcement challenge for the under-resourced staff at the European Commission. The Commission will need to develop procedures to efficiently bring anticircumvention cases, such as those discussed in Franck and Peitz (2024), so that it can credibly enforce against circumvention (Franck & Peitz, 2024).

## V. RECENT LESSONS FROM THE ECONOMICS LITERATURE

The economics literature illustrates the problems we have discussed thus far in stylized platform pricing models. We use three recent papers to guide the discussion.

### A. App Store Fees Charged to Developers

Teh and Wright (2024) develop a platform pricing model and apply it to gatekeepers who sell a product (for example, mobile phone that includes an app store) and set both the price therefore to consumers as well as prices and policies for sellers (for example, fees for app developers). In the basic model consumers single home (i.e. use one phone), while sellers can be active on multiple platforms (for example, develop an app for both iOS and android). Since consumers single home and disintermediation is by assumption impossible, platforms control the access to consumers they attract, which (realistically) gives the gatekeeper significant market power vis-a-vis sellers.

The authors consider the resulting equilibrium prices to consumers and fees to seller chosen by the platform. They show that these are equivalent to the prices and fees a social planner would choose who maximizes the sum of platform and consumer welfare, while ignoring the profits of sellers. Compared with the levels of fees and policies a social planner who was maximizing total welfare would choose, thus, the platform fees and policies disadvantage sellers. Applied to an app store that cannot be circumvented, the model predicts that it will ‘choose excessive commission fee levels, excessive first-party entry, excessive self-preferencing, insufficient investment, excessive limitations on disintermediation by sellers, and excessively stringent app tracking policies’ (Teh & Wright, 2024; Crémer et al., 2023). These findings match nicely with the type of business user complaints that led to the passage of the DMA and also with the emphasis on seller welfare

<sup>19</sup> A universal search function, one that allows users to search for a particular app across all stores available on the handset, can protect users from such tactics.

in the DMA recitals. Going beyond the basic model, if a policy that disadvantages app developers on the gatekeeper's platform also hurt these on others, gatekeepers have additional incentives to charge excessive seller fees (Jeon & Rey, 2024). The authors provide a variety of reasons—including economies of scale in app development, quality, and marketing investment of app developers that is not platform specific, network effects for certain apps, or developers that want to offer their apps at a single price to consumers—for why such negative cross-platform spillovers are likely in the app market, reinforcing the message that the platform chooses policies that from a total welfare perspective excessively disadvantage app developers.

Wang and Wright (2025) expand on the problem of how a platform such as an app store sets fees when sellers (for example, app developers) are permitted to disintermediate the store. Disintermediation is a topical issue because it has long been prohibited on Apple handsets, while the DMA rules explicitly allow developers to transact off the platform. In May 2025 in the United States, a federal judge required Apple to allow developers to inform users where else those users could make purchases—without any gag restrictions and without fees from Apple on those purchases (Epic Games, n.d.-b). This dramatic change (reducing what was a 27 percent fee to zero) caused significant entry of rival payment systems within days. The second important modelling choice the authors make is to allow for arbitrary weights on seller profits, consumer welfare, and platform welfare in the social welfare function to be maximized.<sup>20</sup> This choice allows the model to formally capture the emphasis of the DMA on the welfare of business users.

The authors suppose sales outside of the platform take place at higher margins than those on the platform because the platform induces more intense price competition between sellers. They demonstrate that the total surplus-maximizing fee is one that adds a Pigouvian tax on top of the platform's marginal cost to direct more consumers to the higher-margin, direct channel.<sup>21</sup> At the same time, the paper shows that a platform with market power often chooses fees that exceed the optimal ones from a total surplus perspective, suggesting that limiting these fees improves welfare. Furthermore, the authors demonstrate that allowing showrooming (according to which consumers can search on the platform but buy on the direct channel) in combination with regulating the platform fees yields greater welfare than regulating it alone.

The model skillfully illustrates many of the issues raised in the discussion above, yet is not a perfect fit to the app market and many of the issues we discussed. While showrooming resembles some features of allowing a different app store on the platform, it is hardly the same. Indeed, competing app stores will also facilitate search and thereby put pressure on sellers' margins relative to the direct channel; at the same time, distribution over these channels is often efficient, and if more efficient than at the direct channel, margins may very well be higher within an app store. As illustrated by these two examples, the existing literature models many of the concerns we discuss above. Moreover, as is appropriate in a research context, the models feature a stylized set of policies on the part of the gatekeeper, rather than an existing gatekeeper's particular scheme in a particular year. These models allow for the investigation of optimal fees within a dominant app store, but are not tailored to the specific problem of fees for rival app stores that we identify in the discussion above.

<sup>20</sup> When weights are chosen equally, the social planner maximizes total surplus, which is the case we focus on below.

<sup>21</sup> To establish the optimality of a Pigouvian tax, the authors first demonstrate that when ignoring the sellers' profits, it is optimal to regulate the platform fee to marginal costs, which is likely zero or close to zero. When focusing on total surplus, which includes the sellers' profits, however, the optimal regulated fee is greater than the platform's marginal cost. Intuitively, consumers when choosing whether to shop on the platform or directly do not internalize the different profit margins that sellers earn, and hence from a total welfare point of view are too likely to shop on the platform.

## B. ECPR Oversimplifies the Complexities of App Store Ecosystems

As noted by a number of authors, and more recently, [Bisceglia and Tirole \(2023\)](#) (hereafter BT), the economics of App Stores has many similarities to the economics of access fees in the telecom industries. A large literature has studied the ‘optimal’ determination of these fees, obtaining results that are more nuanced than the zero access fee that we have argued for above. To explain why we believe these proposals to be unsatisfactory, we have chosen to focus on one of them, the ECPR, as BT has rekindled an interest for an adaptation of that model to the economics of apps and app stores.

The problem of access pricing received much research attention at the time AT&T’s prices were regulated by the US government and the company was also funding important economic research at Bell Labs ([Baumol & Sidak, 1994](#)). A well-known solution proposed in this literature was known as the ECPR. Given its original importance and its recent revitalization, it is worthwhile evaluating the usefulness of the ECPR in the quest for a theoretically justified DMA-compliant app store Access Fee. We note that it is critical to account for the significant divergences in the current case from regulated telecommunications or other nondigital industries for which ECPR was developed.

ECPR was developed in the 1970s and 1980s as the deregulation of the large utilities led to a new problem. For instance, a monopolist provider of the local telephone services might compete on the provision of long-distance calls with other long-distance operators who must use the monopolist’s local services to access end consumers. Regulators wondered what ‘access fee’ the local monopolists should be allowed to charge. As Baumol and Willig put it, ‘When several firms compete with one another in the sale of an identical final product, where one of the firms is the monopoly owner of an input that is indispensable in the supply of that product, the problem is how competition in the final product market can be preserved and not tilted to favour either the owner of the input or the owner’s rivals’ ([Baumol et al., 1997](#)). A competitive market in the final product would also align incentives both for use of the service as well as ongoing investment and innovation, generating positive consequences for allocative efficiency, investment in the network, and social welfare.

ECPR, as developed by Baumol and Willig, is the solution that comes out of a simple competitive model and therefore provides an initial benchmark for an optimal access fee. The basic idea of ECPR is that the monopolist should ‘charge’ competitors the same price it charges itself for the essential input. But what is the price the monopolist charges itself for the input? It is the opportunity cost if that input is used by a competitor rather than the monopolist itself, namely the margin on the lost sale. The monopolist sells one less unit of final output and therefore has a *lost profit margin* when it offers capacity to the rival.

An example might help to build intuition for this idea. Assume the price of the final product is €10 per unit, and that producing that unit costs €3. The monopolist therefore earns a net €7 of gross economic margin. Then, forfeiting the use of the intermediate product to accommodate a competitor has an opportunity cost of €7 for the monopolist and this €7 is the access price that the ECPR recommends. If the monopolist charged more, there would be circumstances in which competitors would not access the essential input despite the fact that they could use it more effectively than the monopolist. If the monopolist charged less, there would be cases where the competitors would request access despite the fact that they use the input less efficiently. *We should stress that this presentation hides a number of difficulties, some of which we will discuss below.* In particular, whether the €10 of our example is a competitive price or a monopoly price is critical. The ECPR logic in this simple form does not work if the monopolist is charging a monopoly price.

One of the attractions of ECPR is its apparent simplicity. As Armstrong, Doyle, and Vickers have pointed out, however, this simplicity ‘may be a misleading artefact of simple examples with extreme elasticities’ (Armstrong et al., 1996), and indeed, although ECPR may at one time have enjoyed popularity among economists as a topic for theoretical debate, it found little purchase in the real world, with regulators of legacy industries mostly ignoring or rejecting it as a basis for price regulation.<sup>22</sup> Digital gatekeepers are different from nondigital legacy monopolists in important ways that make ECPR even less likely to offer regulators simple solutions to difficult pricing problems than it offered in those other settings. The technologies themselves have different characteristics from past networks as do the gatekeeper business models, so the analytical path used to regulate them will also differ. In particular, the setting of ECPR is that of competition in a downstream market between a provider of the basic infrastructure used by itself and rival downstream firms. Moreover, the products sold in the downstream market are very similar across firms. This is quite different from the competition among digital platforms and complex ecosystems in today’s digital markets. If ECPR proved overly simplistic for practical application in nondigital legacy industries, there is no basis to presume its straightforward application somehow will generate useful results in two-sided digital markets, the more complex dynamics of which are even less understood.

In the rest of this section, we will discuss some of the assumptions underlying the simple ECPR rule and argue that, apart from providing an interesting intuition, it does not provide much guidance for app and app store pricing.

### C. Monopoly Rents Must Be Subtracted from any Margin

As we have stated above, the final price used in the computation of the ECPR is not necessarily the price that is actually charged by the monopolist. Assume, as it would typically do, that the monopolist chooses an above cost price, which includes a monopoly rent. Applied blindly, the ECPR would have the competitor compensate the monopolist for the loss of monopoly profits! This is explained by Baumol, Ordover, and Willig: ‘We have consequently always maintained that efficiency requires both ECPR and some arrangement that prevents overpricing of both final product and bottleneck input and, consequently, that removes all monopoly profit from the opportunity cost component of [the ECPR formula]’ (Baumol et al., 1997). The correct use of the ECPR would therefore require that the price used in its computation is the price that would obtain if there were competition in the monopolist’s market (Economides & White, 1995).<sup>23</sup> Computing that price is an enormous task and is even more difficult in the case of the digital economy as there are very few benchmarks of ‘perfect’ competition in two-sided platform markets.

This conclusion can also be understood using the logic of the DMA’s goal of contestability. It requires a reduction in barriers to entry and the creation of an environment that allows rivals and business users to compete on the same terms as incumbents. Setting an access fee at the level of the profit earned by the gatekeeper from its own application builds the advantages of the incumbent into an effective entry barrier. Thus, such a fee blocks entry, which is the most important element of contestability. In summary, to achieve the DMA’s goal of contestability, ECPR must reflect competition and not create a barrier to entry.

<sup>22</sup> In a 2006 decision, for example, the UK Competition Appeal Tribunal rejected the use of ECPR as a helpful tool for resolving a dispute regarding water transport rates to be charged by a vertically integrated common carrier water system. The tribunal noted that ‘ECPR is in fact a controversial methodology, both in the academic literature and in regulatory practise,’ noting that it ‘had not been presented with any examples of case studies of ECPR being successfully used’ (Albion Water Ltd, 2006).

<sup>23</sup> The conditions for ECPR to be appropriate are given in Laffont and Tirole, 1994 [52, pp. 1695].

### D. Monopoly Rents Created by Network Effects May, in Practise, Constitute the Bulk of the Gatekeeper's Margin

Before pursuing our analysis, it may be worthwhile reminding the reader of the source of the margins of the gatekeepers. The consequences of switching costs and network effects for the profits of the firms at the nexus of network effects have been discussed at length and are well documented (European Commission, 2019; Digital Competition Expert Panel, 2019; Stigler Committee on Digital Platforms, 2019). Here we provide a simple example of returns to innovation. Assume that a new form of communication is emerging. There are a number of competing firms that offer very similar services. The users all want to join the same network, each user wanting to benefit from connection with as many partners as possible. Once the market has 'tipped' and there is a winning dominant network, it is, as experience has proven, very difficult for those users to coordinate a migration to a better platform *even if* quality is degraded by the platform they are on, or the price increased. As a consequence, the first firm that succeeds in solidifying these network effects can generate profits that are much greater than the social benefits that are due to the quality of its network. Entrenched gatekeepers may continue innovating and improving the quality of the services they offer or they may make the product more exploitative; either way, their incentive to do so is not driven by competition or the fear of losing users to rivals. Regardless of what happens next, the main message is the same: the potential benefits of being the first mover in the digital economy can be disproportionate to that firm's contribution.<sup>24</sup>

The incumbent's network effects generate market power that disadvantages entrants. It also brings other competitive benefits to the incumbent. It creates economies of scale,<sup>25</sup> which lower the cost of the gatekeeper's activity relative to entrants. It allows for the capture of personal data that both allows for a better personalization of the service and increases the value of advertising, which is often an important source of revenue for the gatekeeper. In most cases, entrants do not benefit from all these elements, and the ECPR rule should be adapted for all of these elements to arrive at the optimal fee.<sup>26</sup>

In addition, the DMA's fairness goal requires rebalancing the rents derived from network effects so that they are adequately captured by the participants who created those network effects (Crémer et al., 2023). These participants of course include the business users seeking access to the gatekeeper's platform. As noted above, while any one app only adds a small amount to the value of a mobile operating system, together, the developers are responsible for close to the entirety of the network effects. For example, if all developers left the Apple app store and distributed their software through an alternative channel, the Apple App Store would lose its customers (except, presumably, those seeking the apps supplied by Apple). This pattern would render it incorrect to assign even a substantial part of the value of the network effect to the gatekeeper.

### E. The Zero Lower Bound

Platform services supported by advertising often charge one side of the platform (often end users) a zero-cash price while charging advertisers (or other business users like sellers) a positive fee. A problem arises for the platform because the revenue from advertising (or from sellers) is so large that the gatekeeper would like to attract more end consumers. A brick-and-mortar business that wants more customers would normally consider charging a lower price. This is a

<sup>24</sup> The distortion is even worse if the monopolist violated any competition law to achieve its position.

<sup>25</sup> Economies of scale refer to the fact that the cost of serving more customers is less than proportional to the number of customers.

<sup>26</sup> There has been very little formal economic analysis of this problem. D. Yannelis (Yannelis, 2002) provides an interesting first analysis along these lines, but he assumes that the network externalities affect only the customers of the competitor.

common way restaurants or automobile manufacturers attract more sales, for example. In the case of digital businesses that want to attract end users so they can expose them to valuable advertising, they have lowered the price as far as they can—to zero. BT refer to this problem as the ‘Zero Lower Bound’ (ZLB) and it means the platform is stuck charging end users too high a price unless it creates a mechanism it can use to subsidize consumers.<sup>27</sup> Such mechanisms exist in the credit card industry, for example, when cards have no annual fee and earn consumers valuable points. But if the business does not lower price below zero (pay a subsidy to users) when those users bring in profit, the platform’s price of zero is necessarily above the competitive level.

BT analyse gatekeeper access fees in this environment relative to an ECPR benchmark. They stress the consequence of the ZLB: that it is generally impractical to charge what the ECPR requires, namely a negative price.<sup>28</sup> An important result in the paper is that the welfare-maximizing access charge in the basic model, ECPR, is below the profit maximizing access charge. In other words, the fee the gatekeeper charges when left to its own devices is above the ECPR fee, which is itself higher than the socially optimal fee.

In the BT model, apps earn their owners a benefit that arises through an interaction with the end consumer. This benefit could be a sale of content, valuable data, the sale of advertising, revenue from a freemium business model, and so forth. Because the developer bears zero marginal cost of serving an additional consumer, the developer is happy to charge a money price of zero to earn a positive data or advertising benefit. In the BT model (where there is no monopoly rent), the welfare-maximizing access charge is equal to the benefit the developer (who may be the gatekeeper also) earns from a consumer’s use of the application.

A concern for a European regulator today is that app margins earned through targeted advertising are higher now than they are likely to be in future and thus represent an unreliable benchmark.<sup>29</sup> The types of data that can be processed in the EU and the uses they can be put to are increasingly restricted by new European laws like the DMA. Moreover, these laws typically require meaningful user consent. With neutral choice architecture, it will be much more difficult to obtain ‘consent’ than it is at present. This higher cost of data will reduce the unpriced data benefit currently accruing to gatekeepers. Apps and gatekeepers may need to offer their consumers some kind of benefit to induce those users to share the personal data that powers lucrative personalized advertising. Both the increased costliness of obtaining personal data and the increased difficulty—or impossibility—of deploying it legally after it has been collected will lower the profits of the advertising-supported business model. In the BT model, this represents a decline in the benefit earned by the app. Because in that model the optimal access fee equals this benefit, a decline in the realized benefit causes a decline in whatever remains of the optimal access fee.

## F. Innovation

We consider the argument that reforms eliminating Access Fees will decrease the incentives for innovation. First, recall that the DMA rules only apply to gatekeeper CPSs which are established businesses with a great deal of market power. Therefore, the returns to the original innovation

<sup>27</sup> Some of these authors have explored the possibility of one mechanism that would do just that, creating a market for personal data whereby platforms and others would pay end users for the use of their data through entities we envision as ‘data intermediaries’ (Bergemann et al., 2023).

<sup>28</sup> The importance of the ZLB to the study of platforms was stressed by J.P. Choi and D.S. Leon (Choi & Leon, 2021).

<sup>29</sup> In combination with the DSA and the GDPR, the DMA limits both access to users’ data and what gatekeepers are able to do with any user data they obtain, in particular, whether they can use personal data to target advertising. Meta remains engaged in legal process with national Data Protection Authorities and European courts over how the GDPR affects its ability to take users’ personal data and monetize it. The full effect of the GDPR is therefore yet to be determined, but, in combination with other data laws, is likely to lower the profits of a personal data harvesting and ad-supported business model. The DMA continues this trend by prohibiting the sharing of data across different functions within the gatekeeper without active user consent and is careful about requiring that obtaining user consent be free of manipulative choice architecture.

will already have been recouped, and the policy concern becomes ongoing innovation. But secondly, we believe that the notion incentives to innovate will fall is wrong as a theoretical matter. When network effects are strong, an epsilon advantage by one competitor can cause the market to ‘tip’ in its favour and thereby deliver large and durable monopoly profits. In this setting, the incentives to innovate are very strong when platforms are competing to become the nexus of strong network externalities, that is, at the start of the industry. The incentive that is being reduced is the incentive to ‘win’ which is not the same as the incentive to innovate. Getting a market to tip in favour of one competitor is often achieved through alliances, tying, mergers, and so forth, and the current environment creates excessive incentives to engage in these tactics.

While that environment also includes incentives to innovate, an open ecosystem maintained through regulation may create even stronger incentives to innovate because business users and end users can easily move their business to a better service. As far as we know, this tradeoff and its consequence for optimal access fees, including the way in which the ECPR should be interpreted when there are network externalities, has not been explored in the economics literature.

### G. Dynamic Competition

In addition, if the application business has the possibility of becoming a competitive threat to the gatekeeper itself in future, or of serving as an access point for another competitive threat to the platform, this will create an incentive for the gatekeeper to engage in foreclosure (as discussed in the Contestability section above). It is critical that this dynamic force be included in any model proposing an access fee. For example, a fee constructed only on the basis of ECPR principles derived from a static environment will be too small and will not neutralize the foreclosure incentives, some of which come from dynamic effects.

### H. Adopting ECPR Would Require a Huge Amount of Data

As we have mentioned above, the ECPR formula has a deceptive simplicity. This is because it is presented in a framework where lots of the complications have been assumed away. But, in reality, they require a great deal of internal knowledge. For instance, correcting for the effect of monopoly power requires knowledge of demand conditions. Incorporating the zero lower bound requires knowledge of the benefits that the platforms obtain from attracting more users. Taking innovation into account would require building a complex dynamic model. And the theoretical results would yield formulas that would depend on various elasticities of demand with respect to price, quality, the presence of other users, and the like; the parameters of these models would be extremely difficult to estimate. The necessary data to make progress would be detailed and might vary with each app. The ECPR is a useful tool to clarify the issues and help think about the problem of access, but it raises difficult modeling and estimation issues in practise.

### I. Incentives of the Gatekeeper

The likely impossibility of solving the ECPR problem intersects with the structure of the DMA. Recall that the gatekeeper must justify any Access Fee based on ECPR and show the fee satisfies the principles of contestability and fairness. That means the gatekeeper must perform all the calculations just described on its own data and business in a way that is transparent to the regulator. The first step is to quantify its profits and profit margin, confidential business information it likely prefers that the regulator not know.

Second, it must estimate the proportion of its profit margin that is due to network effects and entrenched market power. The gatekeeper has no incentive to accurately estimate the share of its profits that are due to its entrenched market power. The greater the share of profits are due to market power, the lower is the optimal Access Fee that entrants must pay the gatekeeper.

In other words, the higher the profits due to entrenched market power, the more the regulator is emboldened to be strict, and the more the gatekeeper expects profits and prices to fall in the regulated environment. Therefore, the gatekeeper gains by underestimating the share due to market power and over-estimating the share due to its own technological contributions. In addition to these calculations being beyond the capability of current techniques and requiring data that may not exist, the gatekeeper's incentives are thus fundamentally misaligned to the project. Before a regulator can rely on any calculations of the gatekeeper regarding optimal ECPR, the perverse incentives of the gatekeeper justify applying the highest standards of proof and engaging in a careful review of the gatekeeper's analysis.

### J. Structural Separation Is a Solution If an Access Fee Harms Contestability

A perfectly computed Access Fee would ensure that the monopolist has no incentive to favour or to disfavour its own product. In reality, for the reasons mentioned above and some more discussed below, such a fee will in practice always be computed imperfectly. In that case, a level playing field between the monopolist and the firms who need access to the infrastructure can only obtain under structural separation, as we argue below.

When a gatekeeper is responsible for calculating the optimal Access Fee, we can anticipate that it will be imperfect in some way. For the incentive reasons just previewed, the regulator might expect the Access Fee suggested by Apple to be too high because this will render competing app stores unprofitable. Conversely, if the Access Fee happens to be too low, Apple would earn less profit from the third party's sale than it can through own sales and will have an incentive to self-preference and foreclose. A third real-world problem is that the firm may not profit maximize at the level of the corporation, and this would introduce different distortions.<sup>30</sup>

In this setting, the regulator will have to scrutinize the costs of the gatekeeper and try to make the Access Fee close to optimal while guarding against attempts at foreclosure by the gatekeeper. The regulator may be able to track the information if the platform and the application formally separate into divisions that do not share costs or operational responsibilities. The regulator will still have to regulate the Access Fee but this task would be made easier in an environment of greater transparency of costs and demand. For this type of real-world reason, regulators sometimes require that a gatekeeper who is permitted to charge an access fee must carry out structural separation of its application business.

For example, when the US Federal Communications Commission (FCC) sought to restrain AT&T to the communications market to protect competition in the burgeoning data processing market, it developed what it termed 'maximum separation' safeguards in addition to mandating access fees (Federal Communications Commission, 1971). In the 1960s and 1970s, the FCC undertook multiple reviews of telecommunication companies' structures ('The Computer Inquiries') and concluded that common carriers like AT&T were permitted to enter the unregulated data market *only* through fully separate subsidiaries.<sup>31</sup> The stated goal of these structural restrictions—and their ultimate effect—was to safeguard contestability (Federal Communications Commission, 1971, 1970). Structural separation and an ability to control the

<sup>30</sup> For example, if a divisional manager of a gatekeeper is compensated based on the growth or the sales of their product (for example, a music app), they may not internalize the opportunity cost of those sales, and the corporation's decisions will not match those of the standard model. Indeed, the economics literature has emphasized that for strategic reasons firms may use contracts that reward managers based not just on profits but also on market share or output; see, for example, J. Vickers (Vickers, 1985) or C. Fershtman and K.L. Judd (Fershtman & Judd, 1987). Beyond strategic reasons, an early and influential development of the firm as a coalition of members with different, sometimes conflicting goals can be found in R.M. Cyert & J.G. March (Cyert & March, 1963). Recent work documented carefully that thinking of firms as single decision maker can be misleading; see, for example, A. Hortaçsu, O.R. Natan, H. Parsley, T. Schweg, & K.R. Williams (Hortaçsu et al., 2024).

<sup>31</sup> The FCC decided that communications companies of a certain size—not smaller, newer entrants—had to abide by the new structural safeguards (Federal Communications Commission, 1980).

specific incentives applied to each part of the business may be a necessary precaution when the regulator is concerned that the gatekeeper's ECPR calculation is imperfect.

To reiterate the main lessons from our analysis, the study of ECPR is a very useful exercise to understand the subtleties of access pricing. On the other hand, it cannot be used uncritically as a direct guide for regulators, and this is especially true in the case of app stores. The literature on access fees extends far beyond ECPR, and it would be impossible to conduct the same detailed analysis for all the proposals that emanate from the core idea. However, we are persuaded that our proposal of a zero access fee is close enough to the optimal solution that it should be adopted.

## VI. CONCLUSION

The DMA contains several provisions that enable rival developers and app stores to avoid paying the gatekeeper's access fees by either moving more easily to rival channels or disintermediating the gatekeeper entirely. To the extent these alternative channels provide a good user experience, they will pressure the gatekeeper to lower its own distribution fees to remain competitive. For this reason, it is critical that gatekeepers do not evade those provisions of the DMA designed to ensure fairness to distributors and third-party app stores, and to promote contestability both on and for the gatekeepers' operating systems and app stores.

The Commission has, for good reason, opened proceedings to determine whether Apple's fee structure imposing access charges on app stores and third-party apps complies with the several provisions of the DMA governing to its CPSs. We think it is plain that Apple's current fee structure violates the DMA, and we expect the Commission will find noncompliance. Our analysis shows that an Access Fee of *zero*, is DMA compliant. A zero Access Fee also advances fairness and contestability and is practical, proportionate, and nonpunitive. For these reasons, we advocate the Commission use its power under Art. 8(2) DMA to specify an Access Fee of zero unless Apple comes up with an alternative proposal that is DMA compliant. For the reasons provided above, we are not sure that such an alternative exists.

This zero Access Fee would not prevent Apple from charging a Review Fee to subsidize security checks that are related to its costs, fees for access to Apple's own app store under terms that are FRAND and available publicly, and DMA-compliant advertising. Nor would it prevent Apple from capturing the value it contributes to the app and app store ecosystem elsewhere in that ecosystem, most obviously through the cost of handsets and handset-related services. But what it cannot do is attempt to monetize its contribution to the value of that ecosystem by charging Access Fees to its rivals that render their access to iOS or the App Store 'ineffective.' Nor may it charge any combination of other fees or impose conditions that individually or collectively render that access ineffective; doing so would run afoul of the DMA's anticircumvention provision.

We emphasize here that the DMA expressly empowers Apple to design its own effective compliance scheme if it can devise one that that would satisfy the requirements of the DMA and that it considers to be superior to the one suggested here. Whatever fee Apple proposes must adhere to Articles 6(4) (allow effective access by third-party app stores) and 5(4) (allow apps and app stores to communicate and consummate transactions with end users through channels of their choosing) as well as satisfy Article 6(7) (allow functionalities available to Apple services to third parties free of charge), Article 8(1) (imposing obligation to *demonstrate* effective compliance), and Article 13(4) (prohibition of circumvention). So far, however, Apple has failed to make such a showing. The Commission therefore should specify app stores fees as we recommend above.

## AUTHOR DISCLOSURES FOR ACCESS PRICING FOR APP STORES UNDER THE DMA

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## SUPPLEMENTARY DATA

Supplementary materials are available at *JOCLEC Journal* online.

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